CRANE

2021 Annual Report

DEAR SHAREHOLDERS,

By any measure, Crane's 2021 results were phenomenal: record adjusted EPS of $6.55, record adjusted operating margin of 15.8%, and record free cash flow of $415 million.* We delivered those results despite myriad challenges in our operating environment from the ongoing pandemic, supply chain disruptions, and the resurgence of substantial inflation. We also achieved this record performance in a period where demand at two of our largest and most profitable businesses—commercial aerospace and Crane Payment Innovations—has begun to recover, but still remains well below pre–COVID levels.

So how did we achieve these results? Consistent execution on growth initiatives, paired with the cadence and discipline of the Crane Business System to drive both growth and productivity.

Driving Sustainable Shareholder Value Creation

Last year's results are further evidence of our capabilities and potential, but our outlook is even more exciting. We believe that 2021 was a true inflection point, with results from years of organic investments, acquisitions, and repositioning our portfolio gaining traction at an accelerating pace. Today, from this starting point, we are extremely confident about our ability to create sustainable, profitable growth for the benefit of all of our stakeholders, driven by four key themes:

- We expect a strong, broad-based, and synchronized recovery across key end markets, along with benefits from our alignment with strong secular trends. These secular trends include, among others, electrification and sensing at Aerospace & Electronics, sustained growth for chemicals and pharmaceuticals at Process Flow Technologies, and automation and security at Payment & Merchandising Technologies.
- We will continue to drive growth from consistent and continued investment in new product development, breakthrough innovations, technology investments, and localization. We are winning today because of the investments we made years ago, and the investments we are making today are solidly positioning us for accelerating growth in the future.
- Our strong cash generation and fiscal discipline enable value creation through capital deployment. We consistently return cash to our shareholders through dividends and share repurchases, we have a long track-record of success acquiring new businesses, and we actively manage the composition of our portfolio through selective divestitures.
- And all of these activities are supported by our incredibly solid foundation, which includes our Crane Business System, as well as our strong culture with its emphasis on ethics, philanthropy, sustainability, and equality.

An Outstanding Team and Great Businesses

At Crane, we believe that our culture is a differentiator for us, and we will continue to prove that as we move forward. The benefits of that culture were particularly evident throughout the challenges of the last two years, and I owe my personal thanks and gratitude to all of Crane's global associates for their commitment, dedication, and hard work. Ethics and integrity, honesty and fairness, philanthropy and sustainability, all in an environment that embraces equality and respect for all on a global basis. The right behaviors and support for all stakeholders, coupled with the power of disciplined cadence and execution of the Crane Business System, while pushing and investing in breakthrough technologies that satisfy and solve our customers' most difficult problems. I remain very proud of who we are at Crane, at what **"Being Crane"** means to all our associates, and how we have helped support one another through these trying times.

This strong foundation is a critical enabler of our success and all that we do for our customers at Crane. Let me give just a few highlights from each of the segments in our portfolio of exciting, differentiated, highly engineered products that are highly valued by our customers for their best-in-class solutions for mission critical applications.

At Aerospace & Electronics, we support a wide array of customers across a broad and diversified market, from deep space missions, to anti-skid brake control systems on commercial

*** Please see non-GAAP Financial Measures tables for details. Metrics presented on a continuing operations basis.**

“Last year’s results are further evidence of our capabilities and potential, but our outlook is even more exciting. We believe that 2021 was a true inflection point, with results from years of organic investments, acquisitions and repositioning our portfolio gaining traction at an accelerating pace.”

–MAX H. MITCHELL
President and Chief Executive Officer

and military aircraft, to microwave solutions for critical radar applications, and power solutions for next generation electronic warfare and more electric vehicles and aircraft.

The overall market strengthened progressively over the course of 2021 as the industry recovered from the severe 2020 impact of COVID-19. Our enviable set of solutions and differentiated technology is both benefiting from this market recovery and seeing accelerating growth from our consistent and continued investment in technology.

Those growth investments included more than a decade of work during an unprecedented period of engineering development for new, single aisle, fuel efficient aircraft such as the Boeing 737MAX, Airbus A320neo, Embraer E2, COMAC C919, and their associated engines. Through that period, we were successful in both retaining our historical position, while also capturing new content. Our strong, sole-sourced position on nearly every major high-volume commercial aircraft program ensures our position for decades to come, both supporting the production of new aircraft, and serving a growing installed base with aftermarket parts and service.

Beyond that focus on core commercial aerospace platforms, we have prioritized engineering efforts on emerging technologies that we expect will be necessary to support the next generation of solutions for commercial and military aircraft, radar, and space applications. These technologies include wireless sensing, advanced pumps and transmitters, high power management for more electric-based aircraft and ground-based vehicles, directed energy, landing gear monitoring and control, motor control, and advanced microwave systems.

We are beginning to see the benefits of those investments which continue to expand our addressable market and align our business with accelerating secular trends. A few specific recent wins include the largest modernization & upgrade program award in our history to provide an upgraded brake control system for the F-16, and a program to provide advanced, high-accuracy, high-performance pressure sensors for a multi-platform turbofan engine application where we displaced an incumbent supplier. At our microwave business, we have more than 20 programs currently in development compared to an average of approximately five at most times over the last 10 years. Further, we have been selected for numerous demonstrator programs given our advanced capabilities across several technologies including wireless sensing to reduce aircraft weight, advanced fuel flow monitoring and management in harsh environments with extraordinary precision, engine lubrication systems that can operate at extreme pressures and temperatures, and liquid cooling systems for pure-electric and hybrid-electric propulsion. Aerospace & Electronics has a very exciting future ahead.

At Process Flow Technologies, we changed the segment name from the legacy "Fluid Handling" during the year as the old name no longer reflected where the business is today, nor where it is strategically focused moving forward. The new name, Process Flow Technologies, better conveys the key strengths and core competencies of our business: providing proprietary and highly engineered process flow technology.

We remain focused on the chemical, petrochemical, pharmaceutical, water and wastewater, and general industrial markets, which include many of the harshest and most hazardous environments, and our products are used in applications with extremely high costs of failure. These are the markets where we expect to see the greatest market growth over the next several years, and in addition to the ongoing cyclical recovery, we are driving growth with our robust pipeline of new product development programs and commercial excellence initiatives.

The process valve business continued to expand the breadth of its product portfolio. During 2021, the most notable product launch was the FK-TrieX™ valve for severe service applications, a true breakthrough innovation that directly replaces older valve technologies and provides better flow than competing solutions, superior sealing technology, and lower total cost of ownership. The process valve business also continued to successfully commercialize other products launched over the last few years including its polypropylene-lined large diameter pipe product line, a growing range of metal seated ball valves, and a family of digital pressure transmitters. Across the business, we have a proven track record with new product rollouts, and a strong, repeatable product development process; this process has enabled us to double the percentage of sales from new products over the last few years.

Beyond the process valve business, Crane Pumps & Systems introduced its line of envie³ air-filled motors last year which will materially expand the range of addressable applications for its pump solutions, and it continues to expand its portfolio of SITHE chopper and BLADE grinder pump products. Our Building Services & Utilities business also continues to develop its MK3 line of pressure independent control valves, as well as its portfolio of restrained water couplings.

In addition to new products, Process Flow Technologies is driving share gains through a consistent focus on commercial execution, including our key account and channel management processes, reducing lead-times for product modifications to meet customer needs, improving the efficiency of our front-end processes such as order quote times, and through localization in China, India, and the Middle East.

Payment & Merchandising Technologies had a stellar year in 2021, led by record sales at Crane Currency, and record margins segment-wide. Our growth prospects are supported by strong technology leadership combined with continued expansion of our portfolio of products and solutions. We expect a strong recovery as markets normalize post COVID-19 driven by our strong value proposition centered around proven, high ROI solutions for our customers that improve security and productivity.

At Crane Payment Innovations, we continue to add to our historical strength providing best-in-class critical components and technology for bill and coin validation with a growing range of complete system solutions, a comprehensive connectivity, and cashless offering, and with the 2019 acquisition of Cummins Allison, a strong service network to provide greater capabilities to our customers while also giving us a high-margin recurring revenue stream. Key accomplishments in 2021 included the development of the Alio™ Pro cashless solution for the retail market, further commercialization of other recent product launches including our PayTower and Paypod™ unattended retail solutions, and continued development work on numerous customized self-checkout and kiosk-based solutions.

At Crane Currency, demand for cash remains extremely high, both in the United States and abroad. We continue to win in this business because of our strong customer service, differentiated print capabilities, and the strength and breadth of our security offering, which is unparalleled. During 2021, we released two new micro-optic security products, Breeze™ and Rapid® HD, and we gained substantial share in the international market with our micro-optic security technology specified into 16 new denominations, approximately twice the number of typical annual specifications. During 2021, Crane Currency also made strong progress expanding further into the product authentication space with its existing micro-optic security technology, including a notable partnership with Octane5 in the brand licensing sector.

Capital Deployment and Portfolio Management

The strength of our businesses, combined with improving end markets and solid execution, has driven robust cash generation, further strengthening our balance sheet and credit metrics, and enhancing our financial flexibility. We will continue to drive shareholder return through capital deployment and portfolio management with strict financial discipline and a focus on long-term sustainable value creation.

In 2021, we signed an agreement to sell our Engineered Materials business, which was the product of our 35+ year-long history of acquisitions and facility realignments. This is an excellent business with dedicated and highly capable associates, and I want to thank the entire team for their unwavering support, understanding and professionalism throughout this process. However, as we have shaped our portfolio over time, we have focused on becoming simpler, more global, higher growth, and less cyclical. As we assessed the strategic fit of this business to Crane, we concluded that this exceptional team will be better able to pursue both organic and inorganic growth with the new owner.

Throughout the year, we also actively pursued a substantial number of acquisitions with a focus on our Aerospace & Electronics and Process Flow Technologies segments. While we are confident that acquisitions will continue to be a substantial contributor to our long-term growth, current valuations remain highly elevated, and we will not compromise on our strict financial and strategic acquisition criteria.

In October 2021, we also announced a $300 million share repurchase authorization, and we repurchased just under $100 million of our shares during the fourth quarter. This decision reflects our extremely strong balance sheet and credit metrics, and our stock's current discount to both trading peers and fully synergized acquisition multiples. I believe this should be viewed as both a return of cash following consistently outstanding operational performance and strong free cash generation, as well as a sign of management and the Board's conviction that we have a lot of runway for growth ahead of us.

Being Crane

> ***"I am resolved to conduct my business in the strictest honesty and fairness; to avoid all deception and trickery; to deal fairly with both customers and competitors; to be liberal and just toward employees; and to put my whole mind upon the business."***

Our founder, R.T. Crane, penned this resolution in 1855, and these words continue to guide us today. Ethics, Integrity, Honesty, Fairness for all stakeholders. While having a passion for our businesses. This has been, and remains, at the heart of our leadership principles and behavior at Crane, and we strive to live up to these ideals every day. While there are many facets to "Being Crane," I am particularly proud of our efforts related to philanthropy, sustainability, and equality (PSE):

- **Philanthropy:** Crane's history of philanthropy started with our founder more than a century ago, and our teams around the world are engaged and excited by our efforts in this area. Today, these efforts have a substantial impact through charitable donations, support, and volunteerism in our communities across Crane and around the world.
- **Sustainability:** We have a rigorous process to track, and targets to reduce our greenhouse gas emissions, water and electricity usage, and waste generation. This focus is at the heart of our Crane Business System, whose core principle is the identification of waste, variation, and overburden on our associates and implementation of processes with the goal of driving improvement and efficiency. At Crane, this philosophy drives appreciation and respect for our natural environment, a recognition that resources are limited, and our obligation to responsibly manage our environmental impact as part of the global community.
- **Equality:** Crane remains firmly committed to our fundamental belief in the equality of all persons. We will continue to drive outstanding progress at addressing barriers and behaviors that are counter to "Being Crane," while continuing to improve the diversity of our global workforce. We strongly believe that diversity in all its forms, and the inclusiveness of all associates, will continue to help Crane drive our customer focus and growth for generations to come.

Again, my thanks to all Crane associates globally who continued to work together towards our common goal of supporting customers, stakeholders, and each other during yet another year that was so difficult for many, both personally and professionally. These efforts reflect the best of "Being Crane," and I am so proud of everyone's dedication and continued focus.

In addition, on behalf of our entire global team, I give my thanks to our customers, suppliers, and shareholders for their confidence in us and their support during a difficult period, and the Board of Directors for their continued support, guidance and wisdom through these unprecedented times.

Sincerely,

Max H. Mitchell
President and Chief Executive Officer

NON-GAAP FINANCIAL DATA

RECONCILIATION OF NON-GAAP FINANCIAL MEASURES

The Company reports its financial results in accordance with U.S. generally accepted accounting principles (GAAP). Certain non-GAAP measures are provided in this presentation.

Management believes that non-GAAP financial measures, which exclude certain non-recurring items, present additional useful comparisons between current results and results in prior operating periods. Specifically, management believes that, when considered together with reported amounts, these non-GAAP measures are useful to investors and management in understanding ongoing operations and by providing a clearer view of the underlying trends of the business. In addition, Free Cash Flow provides supplemental information to assist investors and management in analyzing the Company's ability to generate liquidity from its operating activities. The measure of Free Cash Flow does not take into consideration certain other non-discretionary cash requirements such as, for example, mandatory principal payments on the Company's long-term debt. Management uses non-GAAP financial measures in evaluating the Company's core operating results and financial performance. Non-GAAP financial measures, which may be inconsistent with similarly captioned measures presented by other companies, should be viewed as a supplement to, and not as a substitute for or superior to, the Company's reported results prepared in accordance with GAAP. Reconciliations of the Company's non-GAAP financial measures to the most directly comparable GAAP results are included in the tables at the end of this annual report.

FORWARD-LOOKING STATEMENTS—DISCLAIMER

This document may contain forward-looking statements as defined by the Private Securities Litigation Reform Act of 1995. These statements are based on the management's current beliefs, expectations, plans, assumptions, and objectives regarding Crane Co.'s future financial performance and are subject to significant risks and uncertainties. Any discussions contained in this annual report, except to the extent that they contain historical facts, are forward-looking and accordingly involve estimates, assumptions, judgments, and uncertainties. There are a number of factors, including risks and uncertainties related to the ongoing COVID-19 pandemic, that could cause actual results or outcomes to differ materially from those expressed or implied in these forward-looking statements. Such factors also include, among others: uncertainties regarding the extent and duration of the impact of the COVID-19 pandemic on many aspects of our business, operations, and financial performance; changes in economic, financial, and end-market conditions in the markets in which we operate; fluctuations in raw material prices; inflationary pressures; supply chain disruptions; the financial condition of our customers and suppliers; economic, social, and political instability, currency fluctuation, and other risks of doing business outside of the United States; competitive pressures, including the need for technology improvement, successful new product development and introduction, and an inability to pass increased costs of raw materials to customers; our ability to value and successfully integrate acquisitions, to realize synergies and opportunities for growth and innovation, and to attract and retain highly qualified personnel and key management; the risks that any regulatory approval that may be required for the Engineered Materials divestiture is delayed or is not obtained, that the Engineered Materials divestiture does not close, or that the related transaction agreement is terminated, or that the benefits expected from the Engineered Materials divestiture will not be realized or will not be realized within the expected time period; a reduction in congressional appropriations that affect defense spending and our ability to predict the timing and award of substantial contracts in our banknote business; adverse effects on our business and results of operations, as a whole, as a result of increases in asbestos claims or the cost of defending and settling such claims; adverse effects as a result of environmental remediation activities, costs, liabilities and related claims; investment performance of our pension plan assets and fluctuations in interest rates, which may affect the amount and timing of future pension plan contributions; and other risks noted in reports that we file with the Securities and Exchange Commission, including the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2021 and subsequent reports filed with the Securities and Exchange Commission. Crane Co. does not undertake any obligation to update or revise any forward-looking statements.

Additional Information

Share repurchases under the authorization may occur from time to time in open market transactions at prevailing prices or by other means in accordance with federal securities laws. The timing and amount of any repurchases will be determined by the Company's management based on its evaluation of market conditions and other factors. There is no guarantee as to the number of shares that will be repurchased or the amount that will be spent on repurchases, and the repurchases may be extended, suspended, or discontinued at any time without prior notice at the Company's discretion. This annual report is neither an offer to sell, or the solicitation of an offer to purchase, any securities.

NON-GAAP FINANCIAL MEASURES (CONTINUING OPERATIONS BASIS)

For the year ended December 31 ($ in millions, except per share data)

Income Items	2021
Net sales	$3,180
Operating profit	502
Percentage of sales (operating margin)	*15.8%*
Special items impacting operating profit	
Transaction related expenses	8
Repositioning related (gains) charges, net	(10)
Operating profit before special items ("adjusted")	501
Percentage of sales ("adjusted operating margin")	*15.8%*
Net income from continuing operations attributable to common shareholders (GAAP)	$ 394
Per diluted share	*$6.66*
Special items, net of tax, impacting net income from continuing operations attributable to common shareholders	
Transaction related expenses	7
Repositioning related (gains) charges and other, net	(9)
Gain on sale of property	(5)
Net income from continuing operations, net of tax, attributable to common shareholders before special items (adjusted)	$388
Per diluted share ("Adjusted EPS")	$6.55

For the year ended December 31 ($ in millions, except per share data)

Cash Flow Items	2021
Cash provided by operating activities from continuing operations	$ 467
Less: Capital expenditures	(52)
Free cash flow	415

COMMITTEES

The Board of Directors has four standing committees, namely the Executive Committee, Audit Committee, Management Organization and Compensation Committee, and Nominating and Governance Committee.

Other than the Executive Committee, each committee is composed entirely of independent directors as defined by independence standards of the NYSE.

EXECUTIVE COMMITTEE

This committee, which meets when a quorum of the full Board of Directors cannot be readily obtained, may exercise any of the powers of the Board of Directors, except for: (i) approving an amendment of the Company's Certificate of Incorporation or By-Laws; (ii) adopting an agreement of merger or sale of substantially all of the Company's assets or dissolution of the Company; (iii) filling vacancies on the Board or any committee thereof; or (iv) electing or removing officers of the Company.

AUDIT COMMITTEE

This committee is the Board's principal agent in fulfilling legal and fiduciary obligations with respect to matters involving the accounting, auditing, financial reporting, internal control, legal compliance and risk management functions of the Company. This includes oversight of the integrity of financial statements, authority for retention and compensation of the Company's independent auditors, evaluation of qualifications, independence, and performance of the Company's independent auditors, review of staffing and performance of the internal audit function, and oversight of the Company's compliance with legal and regulatory requirements.

MANAGEMENT ORGANIZATION AND COMPENSATION COMMITTEE

This committee's responsibilities include recommending to the Board of Directors all actions regarding compensation of the Chief Executive Officer, approving the compensation of all other executive officers, reviewing the compensation of other officers and business unit presidents, annual review of director compensation, administration of the Annual Incentive Plan and Stock Incentive Plan, and review and approval of significant changes or additions to the compensation policies and practices of the Company. This committee will provide the Chief Executive Officer with an annual performance review. It is also responsible for determining that a satisfactory system is in effect for development and orderly succession of senior managers throughout the Company.

NOMINATING AND GOVERNANCE COMMITTEE

This committee is responsible for identifying, screening, and recommending to the Board candidates for Board membership. It is responsible for sponsoring an annual self-assessment of the Board's performance, as well as the performance of each committee of the Board. It is also responsible for determining the independence of the Company's Board members, and their fitness for service on the Board's various committees, and includes recommending the assignment of Board members to committees and appointment of committee chairs.

DIRECTORS

Martin R. Benante (2, 4)
Retired Chairman and
Chief Executive Officer
Curtiss-Wright Corporation
Supplier of products and services to commercial, industrial, defense, and energy markets

Donald G. Cook (1, 3, 4)
General (Retired)
United States Air Force

Michael Dinkins (2, 4)
Retired Executive Vice President
and Chief Financial Officer
Integer Holdings Corporation
Leader in advanced medical device outsourcing

Ronald C. Lindsay (2, 3)
Retired Chief Operating Officer
Eastman Chemical Company
Manufacturer of specialty chemicals, plastic compounds, and acetate fibers

Ellen McClain (2, 3)
Chief Operating Officer
Year Up
Not-for-profit provider of job training services

Charles G. McClure, Jr. (3, 4)
Managing Partner
Michigan Capital Advisors
Private equity firm investing in global automotive and transportation suppliers

Max H. Mitchell (1)
President and Chief Executive Officer
of Crane Co.

Jennifer M. Pollino (2, 3)
Retired Executive Vice President
Goodrich Corporation
Diversified aerospace and industrial manufacturer

John S. Stroup (3)
Operating Advisor
Clayton, Dubilier & Rice
Private equity manager that invests in and builds businesses

James L. L. Tullis (1)
Chairman of the Board of Crane Co.
Chairman
Tullis Health Investors
Venture capital investor in the health care industry

(1) Member of the Executive Committee
(2) Member of the Audit Committee
(3) Member of the Management Organization and Compensation Committee
(4) Member of the Nominating and Governance Committee

EXECUTIVE OFFICERS

Max H. Mitchell
President and
Chief Executive Officer

Alejandro Alcala
Senior Vice President

Christina Cristiano
Vice President, Controller & Chief Accounting Officer

Anthony M. D'Iorio
Senior Vice President, General Counsel and Secretary

Kurt F. Gallo
Senior Vice President

Scott A. Grisham
Senior Vice President, Business Development & Strategy

Richard A. Maue
Senior Vice President and Chief Financial Officer

Tamara S. Polmanteer
Senior Vice President, Chief Human Resources Officer

Edward S. Switter
Vice President, Treasurer and Tax

CRANE

2021 Form 10-K

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 10-K

☒ **ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the fiscal year ended: December 31, 2021

☐ **TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934**
For the transition period from ________ to _________ .

Commission file number 1-1657

CRANE CO.

(Exact name of Registrant as specified in its charter)

Delaware	**13-1952290**
State of or other jurisdiction of incorporation or organization:	(I.R.S. Employer identification No.)

100 First Stamford Place	**Stamford**	**CT**	**06902**
(Address of principal executive offices)			(Zip Code)

Registrant's telephone number, including area code: (203) 363-7300

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol	Name of each exchange on which registered
Common Stock, par value $1.00	**CR**	**New York Stock Exchange**

Securities registered pursuant to Section 12(g) of the Act:
None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15 (d) of the Act
Yes ☐ No ☒

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days.
Yes ☒ No ☐

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).
Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer", "accelerated filer", "non-accelerated filer,", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act).:

(check one):

Large accelerated filer	☒	Accelerated filer	☐
Non-accelerated filer	☐	Smaller reporting company	☐
		Emerging growth company	☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the Registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes ☐ No ☒

Based on the closing stock price of $92.37 on June 30, 2021, the last business day of the registrant's most recently completed second fiscal quarter, the aggregate market value of the voting common equity held by nonaffiliates of the registrant was $4,557,524,716.

The number of shares outstanding of the registrant's common stock, par value $1.00, was 57,349,962 at January 31, 2022.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the registrant's Proxy Statement for the 2022 Annual Meeting of Stockholders are incorporated herein by reference in Part III of this Annual Report on Form 10-K to the extent stated herein. Such proxy statement will be filed with the Securities and Exchange Commission within 120 days of the registrant's fiscal year ended December 31, 2021

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FORWARD-LOOKING INFORMATION

This Annual Report on Form 10-K contains information about Crane Co., some of which includes "forward-looking statements" within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements are statements other than historical information or statements about our current condition. You can identify forward-looking statements by the use of terms such as: "believes," "contemplates," "expects," "may," "will," "could," "should," "would," or "anticipates," other similar phrases, or the negatives of these terms.

We have based the forward-looking statements relating to our operations on our current expectations, estimates and projections about us and the markets we serve. We caution you that these statements are not guarantees of future performance and involve risks and uncertainties. These statements should be considered in conjunction with the discussion in Part I, the information set forth under Item 1A, "Risk Factors" and with the discussion of the business included in Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations." We have based many of these forward-looking statements on assumptions about future events that may prove to be inaccurate. Accordingly, our actual outcomes and results may differ materially from what we have expressed or forecast in the forward-looking statements. Any differences could result from a variety of factors, including the following:

- The impact of the COVID-19 pandemic which had and may continue to have an adverse impact on our operations and financial performance, as well as on the operations and financial performance of many of the customers and suppliers in industries that we serve; as well as the effects of any government imposed vaccine mandates on the workforce;
- The effect of changes in economic conditions in the markets in which we operate, including financial market conditions, end markets for our products, fluctuations in raw material prices, inflationary pressures, supply chain disruptions and access to key raw materials, and the financial condition of our customers and suppliers;
- Our ongoing need to attract and retain highly qualified personnel and key management;
- The Engineered Materials divestiture does not close or that the related transaction agreement is terminated, or that the benefits expected from the Engineered Materials divestiture will not be realized within the expected time period;
- Economic, social and political instability, currency fluctuation and other risks of doing business outside of the United States;
- Competitive pressures, including the need for technology improvement, successful new product development and introduction and any inability to pass increased costs of raw materials to customers;
- Our ability to successfully integrate acquisitions and to realize synergies and opportunities for growth and innovation;
- Our ability to successfully value acquisitions;
- The ability of the U.S. government to terminate our government contracts;
- Our ability to predict the timing and award of substantial contracts in our banknote business;
- The impact of commercial air traffic levels which are affected by a different array of factors including pandemic health concerns, general economic conditions and global corporate travel spending, or terrorism;
- A reduction in congressional appropriations that affect defense spending;
- The outcomes of legal proceedings, claims and contract disputes;
- Adverse effects on our business and results of operations, as a whole, as a result of increases in asbestos claims or the cost of defending and settling such claims;
- Adverse effects as a result of further increases in environmental remediation activities, costs and related claims;
- Investment performance of our pension plan assets and fluctuations in interest rates, which may affect the amount and timing of future pension plan contributions; and
- Adverse effects of changes in tax, environmental and other laws and regulations in the United States and other countries in which we operate.

Part I

Reference herein to “Crane,” “we,” “us” and “our” refer to Crane Co. and our subsidiaries unless the context specifically states or implies otherwise. Amounts in the following discussion are presented in millions, except employee, square feet, number of properties, share and per share data, or unless otherwise stated.

Item 1. Business

General

We are a diversified manufacturer of highly engineered industrial products. Our operations are comprised of four segments: Aerospace & Electronics, Process Flow Technologies, Payment & Merchandising Technologies, and Engineered Materials. Our primary end markets include process industries (chemical production, oil & gas, power, and general industrial), non-residential and municipal construction, payment automation solutions, banknote design and production, aerospace, defense and space, along with a wide range of general industrial and certain consumer related end markets.

We have been committed to the highest standards of business conduct since inception in 1855 when our founder, R.T. Crane, resolved “to conduct my business in the strictest honesty and fairness; to avoid all deception and trickery; to deal fairly with both customers and competitors; to be liberal and just toward employees; and to put my whole mind upon the business.”

Our strategy is to grow earnings and cash flow by focusing on the manufacturing of highly engineered industrial products for specific markets where our scale is a relative advantage, and where we can compete based on our proprietary and differentiated technology, our deep vertical expertise, and our responsiveness to unique and diverse customer needs. We continuously evaluate our portfolio, pursue acquisitions that complement our existing businesses and selectively divest businesses where appropriate. We strive to foster a performance-based culture focused on productivity and continuous improvement, to attract and retain a committed management team whose interests are directly aligned with those of our shareholders, and to maintain a focused, efficient corporate structure.

We operate a comprehensive set of business processes, philosophies and operational excellence tools to drive continuous improvement throughout our businesses (collectively, the Crane Business System). Beginning with a core value of integrity, we incorporate “Voice of the Customer” teachings (specific processes designed to capture our customers’ requirements) and a broad range of tools into a disciplined strategy deployment process to continuously improve safety, quality, delivery, cost and growth. An embedded intellectual capital development process helps ensure that we attract, develop, promote and retain talent to drive continuity and repeatable results.

Recent Transactions

On May 16, 2021, we entered into an agreement to sell the Engineered Materials segment to Grupo Verzatec S.A. de C.V. for $360 million on a cash-free and debt-free basis. The sale is subject to customary closing conditions and regulatory approvals. We determined that the Engineered Materials segment met the criteria of being reported as a discontinued operation as of June 30, 2021. As a result, the related assets, liabilities and operating results of Engineered Materials are presented as discontinued operations and, as such, have been excluded from both continuing operations and segment results for all periods presented. Throughout this Annual Report on Form 10-K, unless otherwise indicated, amounts and activity are presented on a continuing operations basis. See Part II, Item 8 under Note 3, “Discontinued Operations,” in the Notes to Consolidated Financial Statements for additional details.

Reportable Segments

For additional information on recent business developments and other information about us and our business, please refer to the information set forth under the captions, “Management’s Discussion and Analysis of Financial Condition and Results of Operations,” in Part II, Item 7 of this report, as well as in Part II, Item 8 under Note 4, “Segment Information,” in the Notes to Consolidated Financial Statements for sales, operating profit and assets employed by each segment.

Aerospace & Electronics

The Aerospace & Electronics segment supplies critical components and systems, including original equipment and aftermarket parts, primarily for the commercial aerospace, and the military aerospace, defense and space markets. The commercial market and military market accounted for 52% and 48%, respectively, of total segment sales in 2021. Sales to original equipment manufacturers ("OEM") and aftermarket customers were 74% and 26%, respectively, in 2021.

Crane Aerospace & Electronics has strong brands which have been supplying products to these end markets for several decades. Brands include Hydro-Aire, ELDEC, Lear Romec, P.L. Porter, Keltec, Interpoint, Signal Technology, Merrimac, and Industries.

Products include a wide range of custom designed, highly engineered products used in landing systems, sensing and utility systems, fluid management, seat actuation, power and microelectronic applications, and microwave systems.

Our products are sold directly to aircraft manufacturers, commercial Tier 1 integrators (companies which make products specifically for an aircraft manufacturer), defense and space prime contractors, airlines, government agencies including the U.S. Department of Defense, foreign allied defense organizations, aircraft seat manufacturers, and aircraft maintenance, repair and overhaul organizations.

Facilities are located in the United States, Taiwan, and France.

Process Flow Technologies

In the second quarter of 2021, we changed the name of our 'Fluid Handling' segment to 'Process Flow Technologies'. This new name better conveys the key strengths and core competencies of the segment; providing proprietary and highly engineered process flow technology solutions to its customers. The Process Flow Technologies segment is a provider of highly engineered fluid handling equipment for mission critical applications that require high reliability. The segment is comprised of Process Valves and Related Products, Commercial Valves, and Pumps and Systems.

Process Valves and Related Products manufactures on/off isolation valves, instrumentation and controls, and related products for critical and demanding applications primarily in the chemical and petrochemical, general industrial, energy- related and pharmaceutical end markets globally. Products are sold under the trade names Crane, Saunders, Jenkins, Pacific, Xomox, Krombach, DEPA, ELRO, REVO, Flowseal, Centerline, Resistoflex, Duochek, Barksdale, Dynalco, Westlock, WTA, HOKE and DOPAK. Manufacturing facilities, along with sales and service centers, are located across North America, Europe, the Middle East, Asia and Australia.

Commercial Valves is engaged primarily in the manufacturing of valves and related products for the non-residential construction, general industrial, and municipal markets, and the distribution of pipe, valves and fittings (PVF) for the non-residential construction market. The primary geographies served by the manufacturing operations are the United Kingdom, the Middle East and continental Europe, and the PVF distribution business is focused exclusively on Canada. Brands include Stockham, Wask, Viking Johnson, IAT, Hattersley, NABIC, Sperryn, Wade, and Crane Supply. Manufacturing facilities are located in the United Kingdom and China, with additional sales offices in continental Europe and the Middle East; distribution facilities are located throughout Canada.

Pumps and Systems manufactures pumps and related products for water and wastewater applications in the industrial, municipal, commercial and military markets, primarily in the United States. Products are sold under the trade names Deming, Weinman, Burks and Barnes. Facilities are located in the United States and Canada.

Payment & Merchandising Technologies

The Payment & Merchandising Technologies segment consists of Crane Payment Innovations (“CPI”) and Crane Currency.

CPI provides high technology payment acceptance and dispensing products to original equipment manufacturers, and for certain vertical markets, it also provides currency handling and processing systems, complete cash and cashless payment and merchandising solutions, equipment service solutions, and fully connected managed service solutions. Facilities are located in the United States, the United Kingdom, Mexico, Japan, Switzerland, Germany and the Ukraine, with additional sales offices across the world.

Crane Currency is a supplier of banknotes and highly engineered banknote security features as well as a provider of security features for product authentication. A pioneer in advanced micro-optics technology, Crane Currency provides a wide range of engaging visual effects in features that increase the level of security and public trust in banknotes and for the product brand authentication market. Crane Currency offers uniquely designed banknotes, substrate (paper) and printing capabilities for over 50 central banks around the world, with facilities located in the United States, Sweden and Malta.

Engineered Materials

The Engineered Materials segment manufactures fiberglass-reinforced plastic ("FRP") panels and coils, primarily for use in the manufacturing of recreational vehicles ("RVs"), and in commercial and industrial buildings applications, with some additional applications including trailers and other transportation-related products. Engineered Materials sells the majority of its products directly to RV, trailer, and truck manufacturers, and it uses distributors and retailers to serve the commercial and industrial construction markets. Manufacturing facilities are located in the United States. In the second quarter of 2021, the Engineered Materials segment met the criteria to be reported as discontinued operations. See “Recent Transactions” for additional details.

Other Matters Relating to Our Business as a Whole

Competitive Conditions

Our businesses participate in markets that are highly competitive. Because of the diversity of products manufactured and sold, our businesses typically have a different set of competitors in each geographic area and end market in which they participate. Accordingly, it is not possible to estimate the number of competitors, or precise market share; however, we believe that we are a principal competitor in most of our markets. Our primary basis of competition is providing high quality products, with technological differentiation, at competitive prices, with superior customer service and timely delivery.

Our products are sold into primary end markets which include process industries (chemical production, oil & gas, power, and general industrial), non-residential and municipal construction, payment automation solutions, banknote design and production, aerospace, defense and space, along with a wide range of general industrial and certain consumer related end markets. As such, our revenues depend on numerous unpredictable factors, including changes in market demand, general economic conditions, customer capital spending, timing and amount of contract awards and credit availability. Since our products are sold in such a wide variety of markets, we do not believe that we can reliably quantify or predict the potential effects of changes in any of the aforementioned factors.

Our engineering and product development activities are focused on improving existing products, customizing existing products for particular customer requirements, as well as the development of new products. We own numerous patents, trademarks, copyrights, trade secrets and licenses to intellectual property, no one of which is of such importance that termination would materially affect our business. From time to time, however, we do engage in litigation to protect our intellectual property.

Raw Materials

Our manufacturing operations employ a wide variety of raw materials, including steel, copper, cast iron, electronic components, aluminum, plastics, cotton, flax and various petroleum-based products. We purchase raw materials from a large number of independent sources around the world. Although market forces have at times, including in 2021, caused increases in the costs of key raw materials, there have been no raw materials shortages that have had a material adverse impact on our business. We believe that we will generally be able to obtain adequate supplies of major raw material requirements or reasonable substitutes at acceptable costs. For a further discussion of risks related to raw materials, please refer to Item 1A. “Risk Factors.”

Seasonal Nature of Business

In aggregate, our business does not experience significant seasonality.

Government Contracts

We have agreements relating to the sale of products to government entities, primarily involving products in our Aerospace & Electronics and Payment & Merchandising Technologies segments and, to a lesser extent, our Process Flow Technologies segment. As a result, we are subject to various statutes and regulations that apply to companies doing business with the government. The laws and regulations governing government contracts differ from those governing private contracts. For example, some government contracts require disclosure of cost and pricing data and impose certain sourcing conditions that are not applicable to private contracts. Our failure to comply with these laws could result in suspension of these contracts, criminal or civil sanctions, administrative penalties and fines or suspension or debarment from government contracting or subcontracting for a period of time. For a further discussion of risks related to compliance with government contracting requirements, please refer to Item 1A. “Risk Factors.”

Environmental Compliance and Climate Change

We are regulated by federal, state and international environmental laws governing our use, transport and disposal of substances and control of emissions. Our manufacturing facilities generally do not produce significant volumes or quantities of byproducts that would be considered hazardous waste or otherwise harmful to the environment if not properly handled or maintained. Accordingly, continued compliance with these existing laws has not had a material impact on our capital expenditures or earnings.

However, we occasionally engage in environmental remediation activities as required by federal and state laws. In addition, we may be exposed to other environmental costs including participation in the characterization and remediation of federal Superfund sites, or analogous state sites. When it is reasonably probable we will pay remediation costs at a site, and those costs can be reasonably estimated, we accrue a liability for such future costs with a related charge against our earnings. For further discussion of environmental related risks, please refer to Item 1A. “Risk Factors.” For further discussion of our environmental matters, please refer to Part II, Item 8 under Note 13, “Commitments and Contingencies,” in the Notes to Consolidated Financial Statements.

Human Capital Resources

To remain a leading manufacturer of highly engineered industrial products, it is important that we continue to attract, develop, and retain exceptional talent across our global enterprise.

The Company has a diverse global workforce located in 34 countries, spanning six continents. At December 31, 2021, we employed approximately 11,000 persons worldwide, of which substantially all were full time employees. In the United States, we employed approximately 5,800 people across 94 locations. At December 31, 2021, approximately 4% of our U.S. employees were represented by a union under a collective bargaining agreement. Employees based in some foreign countries may, from time to time, be represented by works councils or unions or subject to collective bargaining agreements. We consider our relations with our employees to be good.

To be an employer of choice and maintain the strength of our workforce, we consistently assess the current business environment and labor market to refine our compensation and benefits programs and other resources available to our associates. We are committed to developing our associates personally and professionally by leveraging a structured and disciplined Intellectual Capital (“IC”) process. This regular IC cadence includes constructive reviews and various talent and leadership development initiatives conducted by the executive management team and provided throughout an associate’s career. We are also committed to an inclusive and high-performance culture at all levels of the organization, based on trust and respect.

The manufacture and production of our products requires the use of a variety of tools, equipment, materials, and supplies. At Crane, we are strongly committed to the health and safety of our associates and strive to continuously adhere to global regulatory safety requirements and to reduce the incidence and severity of job-related injuries. We utilize strict compliance protocols, training programs, effective risk management practices, and sound science in our operations to minimize risk to our associates.

Beginning in 2020, in response to the COVID-19 pandemic, we implemented flexible remote work options and health and safety protocols and procedures across all of our global offices, manufacturing and distribution facilities to ensure the safety and well-being of our associates. These protocols included proper hygiene, social distancing, mask use and temperature screenings and other health and safety standards as required by federal, state and local government agencies, taking into consideration guidelines of the Centers for Disease Control and Prevention in the U.S., and other similar public health authorities in our international locations.

For a discussion of risks related to employee relations, please refer to Item 1A. “Risk Factors.”

Available Information

We file annual, quarterly and current reports and amendments to these reports, proxy statements and other information with the U.S. Securities and Exchange Commission (“SEC”). The SEC maintains an Internet site that contains reports, proxy and information statements and other information regarding issuers, like us, that file electronically with the SEC. The address of the SEC’s website is www.sec.gov.

We also make our filings available free of charge through our Internet website, as soon as reasonably practicable after filing such material electronically with, or furnishing such material, to the SEC. Also posted on our website are our Corporate Governance Guidelines, Standards for Director Independence, Crane Co. Code of Ethics and the charters and a brief description of each of the Audit Committee, the Management Organization and Compensation Committee and the Nominating and Governance Committee. These items are available in the “Investors – Corporate Governance” section of our website at www.craneco.com. The content of our website is not part of this report.

Executive Officers of the Registrant

Name	Position	Business Experience	Age	Executive Officer Since
Max H. Mitchell	President and Chief Executive Officer	President, Chief Executive Officer and Director since 2014. President and Chief Operating Officer from 2013 through 2014. Executive Vice President and Chief Operating Officer from 2011 to 2013.	58	2004
Alejandro Alcala	Senior Vice President	Senior Vice President Process Flow Technologies and operations in China, India and the Middle East & Africa since March 2020. President, Crane ChemPharma & Energy from 2014 to March 2020. President, Crane Pumps & Systems from 2013 to 2014.	47	2020
Christina Cristiano	Vice President, Controller and Principal Accounting Officer	Vice President, Controller and Principal Accounting Officer since May 2019. Vice President, Controller of Global Accounting and Statutory Reporting of Thomson Reuters from 2011 to May 2019.	49	2019
Anthony M. D'Iorio	Senior Vice President, General Counsel and Secretary	Senior Vice President since February 2021. Vice President, General Counsel and Secretary since February 2018. Deputy General Counsel from 2013 through February 2018. Assistant General Counsel from 2005 through 2013.	58	2018
Kurt F. Gallo	Senior Vice President	Senior Vice President, Payment & Merchandising Technologies and Engineered Materials since April 2019. President, Crane Payment Solutions since 2012 and its successor, Crane Payment Innovation since 2014.	57	2019
Scott A. Grisham	Senior Vice President, Business Development and Strategy	Senior Vice President, Business Development and Strategy since April 2021. Vice President, Business Development & Strategy of Colfax Corporation from 2014 to April 2021.	46	2021
Richard A. Maue	Senior Vice President and Chief Financial Officer	Senior Vice President since January 2019. Chief Financial Officer since 2013. Principal Accounting Officer from 2007 through May 2019. Vice President - Finance from 2013 through January 2019.	51	2007
Tamara S. Polmanteer	Senior Vice President, Chief Human Resources Officer	Senior Vice President, Chief Human Resources Officer since March 2021. Chief Human Resources Officer of Aleris from 2016 through 2020. Senior Vice President, Chief Human Resource Officer of Daymon Worldwide from 2011 through 2016.	56	2021
Edward S. Switter	Vice President, Treasurer and Tax	Vice President, Treasurer and Tax since September 2016. Vice President, Tax from 2011 through September 2016.	47	2011

Item 1A. Risk Factors

Our business, financial condition, results of operations and cash flows may be affected by a number of factors including, but not limited to those set forth below. This discussion should be considered in conjunction with the discussion under the caption "Forward-Looking Information" preceding Part I, the information set forth under Item 1, "Business" and with the discussion of the business included in Part II, Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations." These risks comprise the material risks of which we are aware. If any of the events or developments described below or elsewhere in this Annual Report on Form 10-K, or in any documents that we subsequently file publicly were to occur, it could have a material adverse effect on our business, financial condition, results of operations and cash flows.

Risks Relating to Our Business

Macroeconomic fluctuations may harm our business, results of operations and stock price.

Our business, financial condition, operating results and cash flows may be adversely affected by changes in global economic conditions and geopolitical risks, including credit market conditions, trade policies, levels of consumer and business confidence, commodity prices and availability, inflationary pressures, exchange rates, levels of government spending and deficits, political conditions, and other challenges that could affect the global economy including impacts associated with any economic sanctions imposed against Russia, including any territory within the Ukraine that Russia has occupied, in response to their recent invasion of Ukraine. These economic and geopolitical conditions could affect businesses such as ours in a number of ways. Such conditions could have an adverse impact on our flexibility to react to changing economic and business conditions and on our ability to fund our operations or refinance maturing debt balances at economically favorable interest rates. In addition, restrictions on credit availability could adversely affect the ability of our customers to obtain financing for significant purchases and could result in decreases in or cancellation of orders for our products and services as well as impact the ability of our customers to make payments. Similarly, credit restrictions may adversely affect our supplier base and increase the potential for one or more of our suppliers to experience financial distress or bankruptcy. See "Specific Risks Related to Our Business Segments."

The effects of the ongoing coronavirus ("COVID-19") pandemic on our business is uncertain and may adversely affect our results of operations and cash flows.

The COVID-19 pandemic had and may continue to have an adverse impact on our operations and financial performance, as well as on the operations and financial performance of many of the customers and suppliers in industries that we serve. The COVID-19 pandemic continues to present business challenges, and we continue to experience impacts related to COVID-19, primarily in disruptions in global supply chains, delays in supplier deliveries, higher raw material prices, delays in deliveries to customers, travel restrictions, site access and quarantine restrictions, and employee absences. Because the severity, magnitude and duration of the COVID-19 pandemic and its economic consequences remain uncertain and rapidly changing, it is difficult to predict the extent of the pandemic's impact on our operations and financial performance. Further, the ultimate impact of the COVID-19 pandemic on our operations and financial performance depends on many factors that are not within our control, including, but not limited to, duration of the pandemic, potential subsequent waves of COVID-19 infection or potential new variants, the effectiveness and adoption of COVID-19 vaccines and therapeutics, governmental, business and individuals' actions that have been and continue to be taken in response to the pandemic (including shutdown orders, border closings, restrictions on travel and transport and workplace restrictions); and resulting supplier impacts. In addition, to the extent global vaccination programs do not achieve intended results and a longer period of economic and global supply chain and related disruption continues, the more adverse the impact will be on our business operations, financial performance and results of operations. As the impact of the COVID-19 pandemic on the economy and our operations evolves, we will continue to assess our liquidity needs. Worsening worldwide disruption could materially affect our future access to our sources of liquidity, particularly our cash flows from operations and access to credit markets, which could impact our financial condition, capitalization, and capital investments. Conditions in the financial and credit markets may also limit the availability of funding or increase the cost of funding, which could adversely affect our business, financial position and results of operations.

Information systems and technology networks failures and breaches in data security, personally identifiable and other information, non-compliance with our contractual or other legal obligations regarding such information, or a violation of our privacy and security policies with respect to such information, could adversely affect us.

We are dependent on information technology networks and systems, including the Internet, to process, transmit and store electronic information, and, in the normal course of our business, we collect and retain certain types of personally identifiable and other information pertaining to our customers, stockholders and employees. The legal, regulatory and contractual environment surrounding information security and privacy is constantly evolving and companies that collect and retain such information are under increasing attack by cyber-criminals around the world. A theft, loss, fraudulent use or misuse of customer, stockholder, employee or our proprietary data by cybercrime or otherwise, non-compliance with our contractual or other legal obligations regarding such data or a violation of our privacy and security policies with respect to such data could adversely impact our reputation and could result in costs, fines, litigation or regulatory action against us. Security breaches can create system disruptions and shutdowns that could result in disruptions to our operations. We cannot be certain that advances in criminal capabilities, new vulnerabilities or other developments will not compromise or breach the security solutions protecting our information technology, networks and systems. A failure of or cyber-attack on our information systems technology or those of our partners, vendors, suppliers could adversely affect our ability to process orders, maintain proper levels of inventory, collect accounts receivable and pay expenses; all of which could have an adverse effect on our results of operations, financial condition and cash flows. Failure to effectively prevent, detect and recover from security breaches, including attacks on information technology and infrastructure by hackers; viruses; breaches due to employee error or actions; or other disruptions could seriously harm our operations as well as the operations of our customers and suppliers. Such serious harm can involve, among other things, misuse of our assets, business disruptions, loss of data, unauthorized access to trade secrets and confidential business information, unauthorized access to personal information, legal claims or proceedings, reporting errors, processing inefficiencies, negative media attention, reputational harm, loss of sales, remediation and increased insurance costs, and interference with regulatory compliance. We have experienced and expect to continue to experience some of these types of cybersecurity threats and incidents, which could be material in the future.

We are subject to numerous lawsuits for asbestos-related personal injury, and costs associated with these lawsuits may adversely affect our financial condition, results of operations and cash flows.

We are subject to numerous lawsuits for asbestos-related personal injury. Estimation of our ultimate exposure for asbestos-related claims is subject to significant uncertainties, as there are multiple variables that can affect the timing, severity and quantity of claims. Our estimate of the future expense of these claims is derived from assumptions with respect to future claims, settlement and defense costs which are based on experience during the last few years and which may not prove reliable as predictors. A significant upward or downward trend in the number of claims filed, depending on the nature of the alleged injury, the jurisdiction where filed and the quality of the product identification, or a significant upward or downward trend in the costs of defending claims, could change the estimated liability, as would substantial adverse verdicts at trial or on appeal. A legislative solution or a structured settlement transaction could also change the estimated liability. These uncertainties may result in our incurring future charges or increases to income to adjust the carrying value of recorded liabilities and assets, particularly if the number of claims and settlements and defense costs escalates or if legislation or another alternative solution is implemented; however, we are currently unable to predict such future events. The resolution of these claims may take many years, and the effect our financial condition, results of operations and cash flows in any given period from a revision to these estimates could be material.

As of December 31, 2021, we were one of a number of defendants in cases involving 29,958 pending claims filed in various state and federal courts that allege injury or death as a result of exposure to asbestos. See Part II, Item 8 under Note 13, “Commitments and Contingencies,” in the Notes to Consolidated Financial Statements for additional information on:

- Our pending claims;
- Our historical settlement and defense costs for asbestos claims;
- The liability we have recorded in our financial statements for pending and reasonably anticipated asbestos claims through 2059;
- The asset we have recorded in our financial statements related to our estimated insurance coverage for asbestos claims; and
- Uncertainties related to our net asbestos liability

Our ability to source components and raw materials from our suppliers could be disrupted or delayed in our supply chain which could adversely affect our results of operations.

Our operations require significant amounts of necessary components and raw materials. We deploy a continuous, company-wide process to source our components and raw materials from fewer suppliers, and to obtain parts from suppliers in low-cost countries where possible. Due to a variety of global factors, our business has been experiencing, and may continue to experience, supply chain disruptions from an insufficient availability of certain components and raw materials and substantial freight delays in obtaining them. If we are unable to timely source these components or raw materials, our operations may be disrupted, or we could experience a delay or temporary stoppage in certain of our manufacturing operations. We believe that our supply management and production practices are based on an appropriate balancing of the foreseeable risks and the costs of alternative practices. Nonetheless, reduced availability or interruption in supplies, whether resulting from more stringent regulatory requirements; supplier financial condition; increases in duties and tariff costs; disruptions in transportation; an outbreak of a severe public health pandemic, such as the COVID-19 pandemic; severe weather; the occurrence or threat of wars, including Russia’s recent invasion of Ukraine or other conflicts, could have an adverse effect on our financial condition, results of operations and cash flows.

Demand for our products is variable and subject to factors beyond our control, which could result in unanticipated events significantly impacting our results of operations.

A substantial portion of our sales is concentrated in industries that are cyclical in nature or subject to market conditions which may cause customer demand for our products to be volatile. Reductions in demand by these industries would reduce the sales and profitability of the affected business segments.

- In our Aerospace & Electronics segment, a significant decline in demand for air travel, or a decline in airline profitability generally, could result in reduced orders for aircraft and could also cause airlines to reduce their purchases of repair parts from our businesses. In addition, our Aerospace & Electronics segment could be impacted to the extent that our major aircraft manufacturing customers encounter problems which impact their production rates and, correspondingly, reduce purchases of our products (for example, the grounding of the 737 MAX and associated suspension of 737 MAX production announced by Boeing in December 2019 reduced our sales and operating profit in 2020), or if pricing pressure from aircraft customers caused the manufacturers to press their suppliers to lower prices and/or extend payment terms; in addition, demand for military and defense products is dependent upon government spending in certain areas which can vary year to year.
- Our Process Flow Technologies segment is dependent on global economic conditions, customer capital spending and commodity prices. Deterioration in any of these economic factors could result in sales and profits falling below our current outlook.
- Our Payment & Merchandising Technologies segment could be affected by sustained weakness in certain geographic markets or certain end markets such as gaming, retail or banking, as well as low employment levels, office occupancy rates and factors affecting vending operator profitability such as higher fuel, food and equipment financing costs; results could also be impacted by unforeseen advances in payment processing technologies. In addition, our results in this segment are subject to significant variability due to the timing and size of contract awards by central banks for banknote production and actual order rates, particularly with the U.S. government.
- In our Engineered Materials segment, sales and profits could be affected by declines in demand for RVs, building materials or truck trailers; results could also be impacted by unforeseen changes in capacity or price increases related to certain raw materials, in particular, resin.

Our businesses are subject to extensive governmental regulation; failure to comply with those regulations could adversely affect our financial condition, results of operations, cash flows and reputation.

We are required to comply with various import and export control laws, which may affect our transactions with certain customers, particularly in our Aerospace & Electronics, Process Flow Technologies and Payment & Merchandising Technology segments, as discussed more fully under “Specific Risks Relating to Our Business Segments.” In certain circumstances, export control and economic sanctions, and other trade-related regulations may prohibit the export of certain products, services and technologies, and in other circumstances we may be required to obtain an export license before exporting the controlled item. A failure to comply with these requirements might result in suspension of these contracts and suspension or debarment from government contracting or subcontracting. For example, compliance with regulations related to the sourcing of conflict-free minerals mined from the democratic Republic of Congo and adjoining countries could limit the pool of suppliers who can provide conflict-free minerals to us, and as a result, may cause us to incur additional expenses and may create challenges for us to obtain conflict-free minerals at competitive prices. In addition, we are subject to the Foreign Corrupt Practices Act, which prohibits U.S. companies and their intermediaries from making improper payments to foreign officials for the purpose of obtaining or retaining business, or securing any improper advantage. We are also subject to the anti-bribery laws of other jurisdictions. Failure to comply with any of these and similar regulations could result in civil and criminal liability, monetary and non-monetary penalties, fines, disruptions to our business, limitations on our ability to export products and services, and damage to our reputation.

The prices of our components and raw materials could fluctuate dramatically, which may adversely affect our profitability.

The costs of certain components and raw materials that are critical to our profitability can be volatile which can have a significant impact on our profitability. The costs in our business segments are affected by fluctuations in the price of metals such as steel and copper as well as other raw materials such as resin, electronic components, cotton, and flax. We have seen a period of sustained price increases for components and raw materials that may continue into the future as demand increases and supply may remain constrained, which has resulted in, and may continue to result in, increased costs for us. While we have taken actions aimed at securing an adequate supply of raw materials at prices which are favorable to us, if the prices of critical components and raw materials continue to increase or we are unable to pass increased costs of components and raw materials to customers, our operating profit could be adversely affected.

We compete with other manufacturing businesses for highly qualified employees in the countries in which we operate, and we may not be able to retain our personnel or hire and retain additional personnel needed for us to sustain and grow our business as planned.

Our business segments and corporate offices are dependent upon highly qualified personnel, and we generally are dependent upon the continued efforts of key management employees. A number of factors may adversely affect the labor force available to us or increase labor costs, including high employment levels, federal unemployment subsidies, including enhanced or expanded unemployment benefits offered in response to the ongoing COVID-19 pandemic, and other government regulations. We have recently observed an overall tightening and increasingly competitive labor market which could result in higher compensation costs.. While we believe we have a robust intellectual capital process, we may have difficulty retaining key personnel or locating and hiring additional qualified personnel. The loss of the services of any of such personnel or our failure to attract and retain other qualified and experienced personnel on acceptable terms could impair our ability to successfully sustain and grow our business, which could have an adverse effect on our results of operations and financial condition.

Our operations expose us to the risk of environmental liabilities, costs, litigation and violations that could adversely affect our financial condition, results of operations, cash flows and reputation.

Our operations are subject to extensive environmental and health and safety laws and regulations in the jurisdictions in which they operate, which impose limitations on the discharge of pollutants into the ground, air and water and establish standards for the generation, treatment, use, storage and disposal of solid and hazardous wastes. We must also comply with various health and safety regulations in the U.S. and abroad in connection with our operations. The costs of compliance with these regulations results in ongoing costs that may increase over time. Failure to comply with any of these laws could result in civil and criminal liability, substantial monetary and non-monetary penalties and damage to our reputation. In addition, we cannot provide assurance that our costs related to remedial efforts or alleged environmental damage associated with past or current waste disposal practices or other hazardous materials handling practices will not exceed our estimates or adversely affect our financial condition, results of operations and cash flows.

We conduct a substantial portion of our business outside the U.S. and face risks inherent in non-domestic operations.

Net sales by destination outside the U.S. were 48% of our consolidated amounts in 2021. We expect that non-U.S. sales will continue to account for a significant portion of our revenues for the foreseeable future. In addition, our operations outside the U.S. are subject to the risks associated with conducting business internationally, including, but not limited to:

- economic and political instability, including the risk of geopolitical conflict or territorial incursions, in the countries and regions in which we operate;
- the risks of fluctuations in foreign currency exchange rates, primarily the euro, the British pound, the Canadian dollar and the Japanese yen, could adversely affect our reported results, primarily in our Process Flow Technologies and Payment & Merchandising Technologies segments, as amounts earned in other countries are translated into U.S. dollars for reporting purposes; and
- changes in the U.S. government's approach to trade policy, including in some cases renegotiating and terminating certain existing bilateral or multi-lateral trade agreements. The adoption and expansion of trade restrictions, the occurrence of a trade war, or other governmental action related to tariffs or trade agreements or policies has the potential to adversely impact demand for our products, our costs, our customers, our suppliers, and the U.S. economy, which in turn could have a material adverse effect on our business, financial condition, results of operations and cash flows.

We may be unable to identify or to complete acquisitions, or to successfully integrate the businesses we acquire.

We have evaluated, and expect to continue to evaluate, a wide array of potential acquisition transactions. Our acquisition program attempts to address the potential risks inherent in assessing the value, strengths, weaknesses, contingent or other liabilities, systems of internal control and potential profitability of acquisition candidates, as well as other challenges such as retaining the employees and integrating the operations of the businesses we acquire. Integrating acquired operations involves significant risks and uncertainties, including:

- Maintenance of uniform standards, controls, policies and procedures;
- Unplanned expenses associated with the integration efforts;
- Inability to achieve planned facility repositioning savings or related efficiencies from recent and ongoing investments; and
- Unidentified issues not discovered in the due diligence process, including legal contingencies.

There can be no assurance that suitable acquisition opportunities will be available in the future, that we will continue to acquire businesses or that any business acquired will be integrated successfully or prove profitable, which could adversely impact our growth rate. Our ability to achieve our growth goals depends in part upon our ability to identify and successfully acquire and integrate companies and businesses at appropriate prices and realize anticipated cost savings.

Our future results of operations and financial condition could be adversely impacted by intangible asset impairment charges.

As of December 31, 2021, we had goodwill and other intangible assets, net of accumulated amortization, of $1,878.4 million, which represented approximately 42% of our total assets. Our goodwill is subject to an impairment test on an annual basis and is also tested whenever events and circumstances indicate that goodwill may be impaired. Any excess goodwill resulting from the impairment test must be written off in the period of determination. Intangible assets (other than goodwill) are generally amortized over the useful life of such assets. In addition, from time to time, we may acquire or make an investment in a business that will require us to record goodwill based on the purchase price and the value of the acquired assets. We may subsequently experience unforeseen issues with such business that adversely affect the anticipated returns of the business or value of the intangible assets and trigger an evaluation of the recoverability of the recorded goodwill and intangible assets for such business. Future determinations of significant write-offs of goodwill or intangible assets as a result of an impairment test or any accelerated amortization of other intangible assets could have an adverse effect on our financial condition and results of operations.

Our business could be harmed if we are unable to protect our intellectual property.

We rely on a combination of trade secrets, patents, trademarks, copyrights and confidentiality procedures to protect our products and technology. Existing trade secret, patent, trademark and copyright laws offer only limited protection. Our patents could be invalidated or circumvented. In addition, others may develop substantially equivalent, or superseding proprietary technology, or competitors may offer equivalent non-infringing products in competition with our products, thereby substantially reducing the value of our proprietary rights. The laws of some foreign countries in which our products are or may be manufactured or sold may not protect our products or intellectual property rights to the same extent as do the laws of the U.S. We cannot assure that the steps we take to protect our intellectual property will be adequate to prevent misappropriation of our technology. We could incur significant and/or unexpected costs in our efforts to successfully avoid, manage, defend and litigate intellectual property matters. Our inability to protect our intellectual property could have an adverse effect on our financial condition, results of operations and cash flows.

We may be unable to improve productivity, reduce costs and align manufacturing capacity with customer demand.

We are committed to continuous productivity improvement, and we continue to evaluate opportunities to reduce costs, simplify or improve global processes, and increase the reliability of order fulfillment and satisfaction of customer needs. In order to operate more efficiently and control costs, from time to time we execute restructuring activities, which include workforce reductions and facility consolidations. For example, we recorded pre-tax restructuring charges of $32.1 million for the 2020 repositioning program related to actions to reduce our global workforce in response to the adverse economic impact of COVID-19 and integration actions related to the Cummins-Allison acquisition. While these are proactive actions to increase our productivity and operating effectiveness, our inability to adequately respond to potential declines in global demand for our products and services and properly align our cost base could have an adverse effect on our financial condition, results of operations and cash flows.

We could face potential product liability or warranty claims, we may not accurately estimate costs related to such claims, and we may not have sufficient insurance coverage available to cover such claims.

Our products are used in a wide variety of commercial applications and certain residential applications, including, in many cases, in severe service or mission critical applications. We face an inherent business risk of exposure to product liability or other claims in the event our products are alleged to be defective or that the use of our products is alleged to have resulted in harm to others or to property. We may in the future incur liability if product liability lawsuits against us are successful. Moreover, any such lawsuits, whether or not successful, could result in adverse publicity to us, which could cause our sales to decline.

In addition, consistent with industry practice, we provide warranties on many of our products and we may experience costs of warranty or breach of contract claims if our products have defects in manufacture or design or they do not meet contractual specifications. We estimate our future warranty costs based on historical trends and product sales, but we may fail to accurately estimate those costs and thereby fail to establish adequate warranty reserves for them.

While we maintain insurance coverage with respect to certain liability claims, that insurance coverage may not be adequate to cover all claims that may arise or we may not be able to maintain adequate insurance coverage in the future at an acceptable cost. Any liabilities not covered by insurance or that exceed our established reserves could have an adverse effect on our financial condition, results of operations and cash flows.

We may be unable to successfully develop and introduce new products, which would limit our ability to grow and maintain our competitive position and adversely affect our financial condition, results of operations and cash flow.

Our growth depends, in part, on continued sales of existing products, as well as the successful development and introduction of new products or technologies, which face the uncertainty of customer acceptance and reaction from competitors. Any delay in the development or launch of a new product could result in our not being the first to market, which could compromise our competitive position. Further, the development and introduction of new products may require us to make investments in specialized personnel and capital equipment, increase marketing efforts and reallocate resources away from other uses. We also may need to modify our systems and strategy in light of new products that we develop. If we are unable to develop and introduce new products in a cost-effective manner or otherwise manage effectively the operations related to new products, our financial condition, results of operations and cash flows could be adversely impacted.

We face significant competition which may adversely impact our financial condition, results of operations, and cash flows in the future.

While we are a principal competitor in most of our markets, all of our markets are highly competitive. The competitors in many of our business segments can be expected in the future to improve technologies, reduce costs and develop and introduce new products. The ability of our business segments to achieve similar advances will be important to our competitive positions. Competitive pressures, including those discussed above, could cause one or more of our business segments to lose market share or could result in significant price erosion, either of which could have an adverse effect on our financial condition, results of operations and cash flows.

Net periodic pension (benefit) cost and pension contributions associated with our retirement benefit plans may fluctuate significantly depending upon changes in actuarial assumptions and future market performance of plan assets.

Total net periodic pension benefit and pension contributions were $6.8 million and $26.7 million, respectively in 2021. The costs of our defined benefit pension plans are dependent upon various factors, including rates of return on investment assets, discount rates for future payment obligations, and expected mortality, among other things. In addition, funding requirements for benefit obligations of our pension plans are subject to legislative and other government regulatory actions. Variances in related estimates could have an adverse effect on our financial condition, results of operations and cash flows.

Additional tax expense or exposures could affect our financial condition, results of operations and cash flows.

We are subject to income taxes in the U.S. and various international jurisdictions. Our financial condition, results of operations and cash flow could be affected by changes to any or all of the following: tax laws, regulations, accounting principles and judicial rulings, the geographic mix of our earnings, the valuation of our deferred tax assets and liabilities, and the results of audits and examinations of previously filed tax returns.

If our internal controls are found to be ineffective, our financial results or our stock price may be adversely affected.

We believe that we currently have adequate internal control procedures in place for future periods, including processes related to newly acquired businesses; however, increased risk of internal control breakdowns generally exists in any business environment that is decentralized such as ours. In addition, if our internal control over financial reporting is found to be ineffective, investors may lose confidence in the reliability of our financial statements, which may adversely affect our stock price.

Specific Risks Relating to Our Reportable Segments

Aerospace & Electronics

Our Aerospace & Electronics segment sales are primarily affected by conditions in the commercial aerospace industry which is cyclical in nature, and by changes in defense spending by the U.S. government.

Commercial aircraft are procured primarily by airlines, and airline capital spending can be affected by a number of factors including credit availability, current and expected fuel prices, and current and forecast air traffic demand levels. Air traffic levels are affected by a different array of factors including general economic conditions and global corporate travel spending, although other non-economic events can also adversely impact airline traffic, including terrorism or pandemic health concerns, such as the COVID-19 pandemic. Our commercial business is also affected by the market for business jets where demand is typically tied to corporate profitability levels, and the freight markets which are most heavily influenced by general economic conditions. Demand for our commercial aftermarket business is closely tied to total aircraft flight hours. Any decrease in demand for new aircraft or equipment, or use of existing aircraft and equipment, would likely result in decreased sales of our products and services. In addition, our commercial business could also be impacted to the extent that our major aircraft manufacturing customers encounter problems which impact their production rates and, correspondingly, reduce purchases of our products (for example, the grounding of the 737 MAX and associated suspension of 737 MAX production announced by Boeing in December 2019 reduced our sales and operating profit in 2020), or if pricing pressure from aircraft customers caused the manufacturers to press their suppliers to lower prices and/or extend payment terms.

The defense portion of the segment's business is dependent primarily on U.S. government spending, and to a lesser extent, foreign government spending, on the specific military platforms and programs where our business participates. Any reduction in appropriations for these platforms or programs could impact the performance of our business. Our sales to defense customers are also affected by the level of activity in military flight operations.

We are required to comply with various export control laws, which may affect our transactions with certain customers. In certain circumstances, export control and economic sanctions regulations may prohibit the export of certain products, services and technologies, and in other circumstances we may be required to obtain an export license before exporting the controlled item. We are also subject to investigation and audit for compliance with the requirements governing government contracts, including requirements related to procurement integrity, manufacturing practices and quality procedures, export control, employment practices, the accuracy of records and the recording of costs and information security requirements. A failure to comply with these requirements could result in suspension of these contracts, and suspension or debarment from government contracting or subcontracting. Failure to comply with any of these regulations could result in civil and criminal liability, monetary and non-monetary penalties, fines, disruptions to our business, limitations on our ability to export products and services, and damage to our reputation.

Due to the lengthy research and development cycle involved in bringing commercial and military products to market, we cannot accurately predict the demand levels that will exist once a given new product is ready for market. In addition, if we are unable to develop and introduce new products in a cost-effective manner or otherwise effectively manage the introduction of new products and/or programs, our results of operations and financial condition could be adversely impacted. Demand for our products could also be adversely impacted by industry consolidation that could result in greater acceptance of competitors' products.

Process Flow Technologies

Our Process Flow Technologies segment competes in markets that are fragmented and highly competitive. The business competes against large, well established global companies, as well as smaller regional and local companies. We compete based on our products' quality, reliability and safety, our brand reputation, value-added technical expertise and customer support and consistent on-time delivery.

Demand for our Process Flow Technologies products is heavily dependent on our customers' level of new capital investment and planned maintenance expenditures. Customer spending typically depends on general economic conditions, availability of credit, and expectations of future demand. Slowing global economic growth, volatility in commodity prices, including the price of oil could all contribute to lower levels of customer spending, and project delays or cancellations.

A portion of this segment's business is subject to government contracting rules and regulations. Failure to comply with these requirements could result in suspension or debarment from government contracting or subcontracting, civil and criminal liability, monetary and non-monetary penalties, disruptions to our business, limitations on our ability to export products and services, or damage to our reputation. At our foreign operations, results could also be adversely impacted by a weakening of local currencies against the U.S. dollar. Our Process Flow Technologies business has the greatest exposure to the euro, British pound and Canadian dollar, and lesser exposure to several other currencies.

Payment & Merchandising Technologies

Our Payment & Merchandising Technologies segment sales are dependent on capital spending in a variety of end markets and across numerous geographies. The level of capital expenditures by our customers depends on general economic conditions, availability of credit, and expectations of future demand. In addition, our results in this segment are subject to significant variability due to the timing and size of contract awards by central banks for banknote production and actual order rates, particularly with the U.S. government.

This business regularly develops and markets new products. Delays in the product development process, the inability of new products to meet targeted performance measures, or the discovery of a successful counterfeit of our security technology products could hurt future sales. This business is also directly and indirectly exposed to changes in government regulations; for example, changes in gaming regulations could influence the spending patterns of our casino operator customers, or changes in anti-money laundering regulations could result in additional technical requirements for our products. We are also subject to investigation and audit for compliance with the requirements governing government contracts, including requirements related to procurement integrity, manufacturing practices and quality procedures, export control, employment practices, the accuracy of records and the recording of costs and information security requirements. A failure to comply with these requirements could result in suspension of these contracts, and suspension or debarment from government contracting or subcontracting. Failure to comply with any of these regulations could result in civil and criminal liability, monetary and non-monetary penalties, fines, disruptions to our business, limitations on our ability to export products and services, and damage to our reputation.

At our foreign operations, results could also be adversely impacted by a weakening of local currencies against the U.S. dollar; this business has the greatest exposure to the euro, British pound, the Japanese yen, and the Mexican peso, although there is lesser exposure to several other currencies. In addition, our facility in Mexico operates under the Mexican Maquiladora program. This program provides for reduced tariffs and eased import regulations; we could be adversely affected by changes in such program, or by our failure to comply with its requirements.

Engineered Materials

Our Engineered Materials segment manufactures and sells fiberglass reinforced plastic ("FRP") panels and coils, primarily for use in the manufacturing of RVs, trucks, and trailers, with additional applications in commercial and industrial building construction. Demand in these end markets is dependent on general economic conditions, credit availability, and consumer and corporate spending levels. A decline in demand in any of these end markets, including a significant change in RV industry capacity; a loss of market share to alternative materials such as, for example, non-reinforced plastic, PVC, tile, stainless steel, epoxy paint, wood, and aluminum; or customer pricing pressure would result in lower sales and profits for this business. Profitability could also be adversely affected by an increase in the price of resin or fiberglass if we are unable to pass the incremental costs on to our customers. Additional risks include the loss of a principal supplier. In the second quarter of 2021, the Engineered Materials segment met the criteria to be reported as discontinued operations. Risks associated with the divestiture of the Engineered Materials segment include any regulatory approval that may be required for such divestiture is delayed or is not obtained, that the Engineered Materials divestiture does not close or that the related transaction agreement is terminated, or that the benefits expected from the Engineered Materials divestiture will not be realized or will not be realized within the expected time period. See Part II, Item 8 under Note 3, "Discontinued Operations," in the Notes to Consolidated Financial Statements for additional details.

Item 1B. Unresolved Staff Comments

None

Item 2. Properties

The following is a summary of our principal facilities from continuing operations as of December 31, 2021:

	Facilities - Owned									
Location	Aerospace & Electronics		Process Flow Technologies		Payment & Merchandising Technologies		Corporate		Total	
	Number	Area (sq. ft.)	Number	Area (sq. ft.)	Number	Area (sq. ft.)	Number	Area (sq. ft.)	Number	Area (sq. ft.)
Manufacturing										
United States	6	724,240	6	698,573	7	1,346,404	—	—	19	2,769,217
Canada	—	—					—	—	—	—
Europe	—	—	6	671,573	3	732,713	—	—	9	1,404,286
Other international	—	—	4	354,412	2	294,666	—	—	6	649,078
	6	724,240	16	1,724,558	12	2,373,783	—	—	34	4,822,581
Non-Manufacturing										
United States	—	—	2	98,510	7	286,973	—	—	9	385,483
Canada	—	—	6	143,634	—	—	—	—	6	143,634
Europe	—	—	2	73,780	1	11,000	—	—	3	84,780
Other international	—	—	—	—	—	—	—	—	—	—
	—	—	10	315,924	8	297,973	—	—	18	613,897

	Facilities - Leased									
Location	Aerospace & Electronics		Process Flow Technologies		Payment & Merchandising Technologies		Corporate		Total	
	Number	Area (sq. ft.)	Number	Area (sq. ft.)	Number	Area (sq. ft.)	Number	Area (sq. ft.)	Number	Area (sq. ft.)
Manufacturing										
United States	—	—	2	97,220	1	141,049	—	—	3	238,269
Canada	—	—	1	20,572	—	—	—	—	1	20,572
Europe	—	—	3	707,259	2	35,771	—	—	5	743,030
Other international	1	63,653	3	437,740	—	—	—	—	4	501,393
	1	63,653	9	1,262,791	3	176,820	—	—	13	1,503,264
Non-Manufacturing										
United States	3	12,718	6	186,765	51	269,209	3	39,875	63	508,567
Canada	—	—	22	474,286	5	16,327	—	—	27	490,613
Europe	2	28,589	6	49,173	4	279,948	—	—	12	357,710
Other international	—	—	17	108,599	4	17,627	—	—	21	126,226
	5	41,307	51	818,823	64	583,111	3	39,875	123	1,483,116

In our opinion, these properties have been well maintained, are in good operating condition and contain all necessary equipment and facilities for their intended purposes.

Item 3. Legal Proceedings.

Discussion of legal matters is incorporated by reference to Part II, Item 8 under Note 13, "Commitments and Contingencies," in the Notes to Consolidated Financial Statements.

Item 4. Mine Safety Disclosures.

Not applicable.

Part II

Item 5. Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

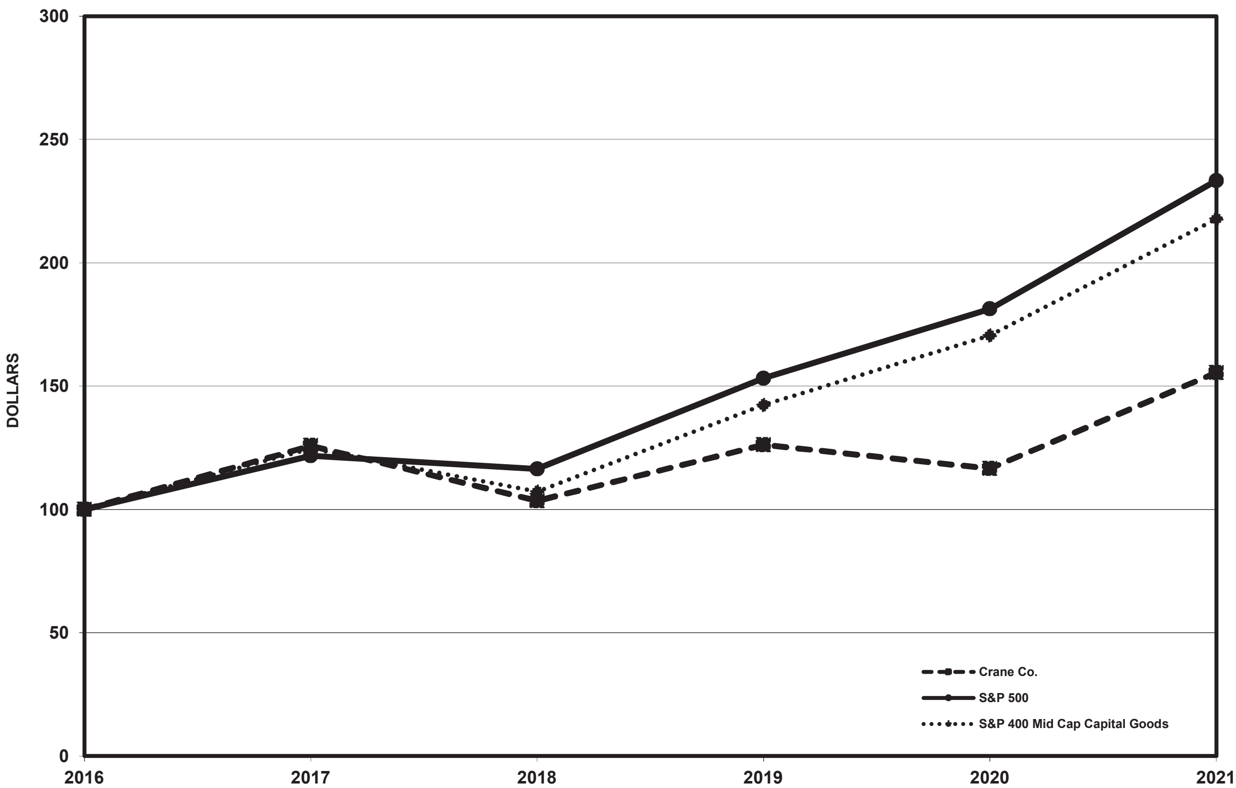
Market Information

Crane Co. common stock is traded on the New York Stock Exchange ("NYSE") under the symbol "CR". As of December 31, 2021, there were 1,683 holders of record of Crane Co. common stock.

Stock Performance Graph

The following chart compares the total stockholder returns (stock price increase plus reinvested dividends) on our common stock from December 31, 2016 through December 31, 2021 with the total stockholder returns for the S&P 500 Index and the S&P MidCap Capital Goods Index. The graph assumes that the value of the investment in the common stock and each index was $100 on December 31, 2016 and that all dividends were reinvested.

COMPARISON OF FIVE YEAR CUMULATIVE TOTAL RETURN
Among Crane Co., S&P 500, and S&P 400 Mid Cap Capital Goods
Fiscal Year Ending December 31,



		2016	2017	2018	2019	2020	2021
Crane Co	($)	100	126	103	126	117	155
S&P 500	($)	100	122	116	153	181	233
S&P 400 Mid Cap Capital Goods	($)	100	125	107	142	171	218

Purchases of Equity Securities

On October 25, 2021, the Company announced that its Board of Directors authorized the Company to purchase up to $300 million of its common stock through a share repurchase program (the "Program") that calls for shares to be purchased in the open market from time-to-time at prevailing prices in accordance with federal securities laws. The Program expires on April 22, 2022. The following table only includes the open market repurchases of our common stock during the three months ended December 31, 2021.

	Total number of shares purchased [a]		Average price paid per share [b]	Total number of shares purchased as part of publicly announced plans or programs		Maximum dollar value of shares that may yet be purchased under the plans or programs (in millions)
October 1-31	11,296	$	103.46	11,296	$	298.8
November 1-30	457,173	$	104.51	468,469	$	251.1
December 1-31	490,944	$	99.78	959,413	$	202.1
Total October 1 — December 31, 2021	959,413	$	102.08			

[a] Shares repurchased are based on the trade date

[b] Excludes any fees, commissions or other expenses associated with share repurchases

We routinely receive shares of our common stock as payment for stock option exercises and the withholding taxes due on stock option exercises and the vesting of restricted share units from stock-based compensation program participants.

Equity Compensation Plans

For information regarding equity compensation plans, see Item 12 of this annual report on Form 10-K.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion and analysis of our financial condition and results of operations should be read together with our consolidated financial statements and related notes included under Item 8 of this Annual Report on Form 10-K.

We are a diversified manufacturer of highly engineered industrial products. Our operations are comprised of four segments: Aerospace & Electronics, Process Flow Technologies, Payment & Merchandising Technologies, and Engineered Materials. Our primary end markets include process industries (chemical production, oil & gas, power, and general industrial), non-residential and municipal construction, payment automation solutions, banknote design and production, aerospace, defense and space, along with a wide range of general industrial and certain consumer related end markets.

Our strategy is to grow earnings and cash flow by focusing on the manufacturing of highly engineered industrial products for specific markets where our scale is a relative advantage, and where we can compete based on our proprietary and differentiated technology, our deep vertical expertise, and our responsiveness to unique and diverse customer needs. We continuously evaluate our portfolio, pursue acquisitions that complement our existing businesses and are accretive to our growth profile, selectively divest businesses where appropriate, and pursue internal mergers to improve efficiency. We strive to foster a performance-based culture focused on productivity and continuous improvement, to attract and retain a committed management team whose interests are directly aligned with those of our shareholders, and to maintain a focused, efficient corporate structure.

We will continue to execute this strategy while remaining committed to the values of our founder, R.T. Crane, who resolved to conduct business "in the strictest honesty and fairness; to avoid all deception and trickery; to deal fairly with both customers and competitors; to be liberal and just toward employees; and to put my whole mind upon the business."

Due to rounding, numbers presented throughout this report may not add up precisely to totals we provide and percentages may not precisely reflect the absolute figures.

Recent Transactions

On May 16, 2021, we entered into an agreement to sell the Engineered Materials segment to Grupo Verzatec S.A. de C.V. for $360 million on a cash-free and debt-free basis. The sale is subject to customary closing conditions and regulatory approvals. We determined that the Engineered Materials segment met the criteria of being reported as a discontinued operation as of June 30, 2021. As a result, the related assets, liabilities and operating results of Engineered Materials are presented as discontinued operations and, as such, have been excluded from both continuing operations and segment results for all periods presented. Throughout this Annual Report on Form 10-K, unless otherwise indicated, amounts and activity are presented on a continuing operations basis. See Item 8 under Note 3, "Discontinued Operations," in the Notes to Consolidated Financial Statements for additional details.

This section of this Form 10-K generally discusses 2021 and 2020 items and year-to-year comparisons between 2020 and 2019. Segment discussions of 2019 items and year-to-year comparisons between 2020 and 2019 that are not included in this Form 10-K can be found in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2020.

Results from Continuing Operations

	For the year ended December 31,			2021 vs 2020 Favorable / (Unfavorable) Change		2020 vs 2019 Favorable / (Unfavorable) Change	
(in millions, except %)	2021	2020	2019	$	%	$	%
Net sales:							
Aerospace & Electronics	$ 638.3	$ 650.7	$ 798.8	$ (12.4)	(1.9)%	$ (148.1)	(18.5)%
Process Flow Technologies	1,196.6	1,005.8	1,117.4	190.8	19.0 %	(111.6)	(10.0)%
Payment & Merchandising Technologies	1,345.1	1,104.8	1,158.3	240.3	21.8 %	(53.5)	(4.6)%
Total net sales	$3,180.0	$ 2,761.3	$ 3,074.5	$ 418.7	15.2 %	$ (313.2)	(10.2)%
Sales growth:							
Core business				$ 343.1	12.4 %	$ (532.1)	(17.3)%
Foreign exchange				70.6	2.6 %	7.2	0.2 %
Acquisitions/dispositions				5.0	0.2 %	211.7	6.9 %
Total sales growth				$ 418.7	15.2 %	$ (313.2)	(10.2)%
Operating profit (loss):							
Aerospace & Electronics	$ 110.0	$ 100.7	$ 189.4	$ 9.3	9.2 %	$ (88.7)	(46.8)%
Process Flow Technologies	182.5	97.7	131.7	84.8	86.8 %	(34.0)	(25.8)%
Payment & Merchandising Technologies	307.5	100.6	177.3	206.9	205.7 %	(76.7)	(43.3)%
Corporate expense	(97.7)	(58.8)	(67.4)	(38.9)	(66.2)%	8.6	12.8 %
Corporate - Asbestos provision, net	—	—	(229.0)	—	—	229.0	NM
Corporate - Environmental provision, net	—	—	(18.9)	—	—	18.9	NM
Total operating profit	$ 502.3	$ 240.2	$ 183.1	$ 262.1	109.1 %	$ 57.1	31.2 %
Operating margin:							
Aerospace & Electronics	17.2 %	15.5 %	23.7 %				
Process Flow Technologies	15.2 %	9.7 %	11.8 %				
Payment & Merchandising Technologies	22.9 %	9.1 %	15.3 %				
Total operating margin	15.8 %	8.7 %	6.0 %				
Acquisition-related and integration charges [a]	$ —	$ 12.9	$ 5.2				
Restructuring and related (gains) charges, net [a]	$ (9.6)	$ 36.8	$ 29.1				
Transaction related expenses [a]	$ 8.2	$ —	$ —				

(a) Acquisition-related and integration charges, restructuring and related (gains) charges, net and transaction related expenses are included in operating profit and operating margin.

Items Affecting Comparability of Reported Results

The comparability of our results from continuing operations for the years ended December 31, 2021, 2020 and 2019 is affected by the following significant items:

Restructuring and Related (Gains) Charges, net

In 2021, we recorded total pre-tax restructuring and related gains of $9.6 million primarily related to a gain on the sale of real estate. In 2020, we recorded total pre-tax restructuring and related charges of $36.8 million primarily in response to the adverse economic impact of COVID-19 and integration actions related to the Cummins-Allison acquisition. In 2019, we recorded total pre-tax restructuring and related charges of $29.1 million; $9.9 million was related to the repositioning actions initiated in December 2019 in our Process Flow Technologies segment, $5.9 million was related to the acquisition of Crane Currency, and $13.3 million was related to our 2017 repositioning actions.

We expect pre-tax savings subsequent to completing all actions for all programs to approximate $165 million. Please refer to the individual segment discussion and analysis that follows, as well as Item 8 under Note 16, "Restructuring" in the Notes to Consolidated Financial Statements for further discussion.

Transaction Related Expenses

During 2021, we recorded pre-tax transaction related expenses of $8.2 million related to the divestiture of Engineered Materials and other professional fees.

Acquisition-Related and Integration Charges

During 2020 and 2019, we recorded pre-tax acquisition-related and integration charges of $12.9 million and $5.2 million, respectively. Please refer to Item 8 under Note 2, "Acquisitions" in the Notes to Consolidated Financial Statements for further discussion.

Asbestos Provision, net

In 2019, we recorded a pre-tax provision, net of insurance recoveries of $229.0 million associated with updating our estimated asbestos liability through the generally accepted end point in 2059. Please refer to Item 8 under Note 13, "Commitments and Contingencies" in the Notes to Consolidated Financial Statements for further discussion.

Environmental Provision, net

In 2019, we recorded a pre-tax provision, net of reimbursements of $18.9 million to extend accrued costs through 2027 at the former manufacturing site in Goodyear, Arizona (the "Goodyear Site"). Please refer to Note 13, "Commitments and Contingencies" in the Notes to Consolidated Financial Statements for further discussion.

OVERALL

2021 compared with 2020

Sales increased by $418.7 million, or 15.2%, to $3,180.0 million in 2021. The year-over-year higher sales included:

- an increase in core sales of $343.1 million, or 12.4%;
- favorable foreign currency translation of $70.6 million, or 2.6%; and
- an increase in sales related to acquisitions of $5.0 million, or 0.2%.

Operating profit increased by $262.1 million, or 109.1%, to $502.3 million in 2021. The increase in operating profit reflected higher operating profit in each of our segments, partially offset by higher corporate costs. Operating profit in 2021 included net restructuring and related gains of $9.6 million and transaction related expenses of $8.2 million. Operating profit in 2020 included restructuring and related charges of $36.8 million and acquisition-related and integration charges of $12.9 million.

2020 compared with 2019

Sales decreased by $313.2 million, or 10.2%, to $2,761.3 million in 2020. The year-over-year lower sales included:

- a decrease in core sales of $532.1 million, or 17.3%, partially offset by
- an increase in sales related to acquisitions of $211.7 million, or 6.9%; and
- favorable foreign currency translation of $7.2 million, or 0.2%.

Operating profit increased by $57.1 million, or 31.2%, to $240.2 million in 2020. The increase in operating profit reflected the absence of the $229.0 million asbestos provision, net and the $18.9 million environmental provision, net, together with lower corporate costs. These increases were largely offset by lower operating profit in each of our segments. Operating profit in 2020 included restructuring and related charges of $36.8 million and acquisition-related and integration charges of $12.9 million. Operating profit in 2019 also included restructuring and related charges of $29.1 million and acquisition-related and integration charges of $5.2 million.

Comprehensive income

(in millions) For the year ended December 31,	2021	2020	2019
Net income before allocation to noncontrolling interests	$ 435.4	$ 181.1	$ 133.6
Other comprehensive income (loss), net of tax			
Currency translation adjustment	(69.2)	70.4	11.5
Changes in pension and postretirement plan assets and benefit obligation, net of tax	96.0	(53.6)	(47.7)
Other comprehensive income (loss), net of tax	26.8	16.8	(36.2)
Comprehensive income before allocation to noncontrolling interests	462.2	197.9	97.4
Less: Noncontrolling interests in comprehensive income (loss)	0.6	(0.5)	(0.1)
Comprehensive income attributable to common shareholders	$ 461.6	$ 198.4	$ 97.5

For the year ended December 31, 2021, comprehensive income before allocation to noncontrolling interests was $462.2 million compared to $197.9 million in 2020. The $264.3 million increase was primarily driven by $254.3 million of higher net income before allocation to noncontrolling interests and a $149.6 million increase primarily related to changes in pension discount rates, partially offset by a $139.6 million unfavorable impact of foreign currency translation adjustments, primarily related to the British pound and euro.

AEROSPACE & ELECTRONICS

(in millions, except %) For the year ended December 31,	2021	2020	2019
Net sales by product line:			
Commercial Original Equipment	$ 229.4	$ 226.4	$ 357.2
Military Original Equipment	239.7	258.7	217.2
Commercial Aftermarket	104.5	93.0	161.4
Military Aftermarket	64.7	72.6	63.0
Total net sales	$ 638.3	$ 650.7	$ 798.8
Operating profit	$ 110.0	$ 100.7	$ 189.4
Restructuring and related charges, net [(a)]	$ —	$ 6.5	$ 2.3
Assets	$ 604.7	$ 593.9	$ 638.1
Backlog	$ 459.8	$ 491.2	$ 567.4
Operating margin	17.2 %	15.5 %	23.7 %

(a) Restructuring and related charges, net are included in operating profit and operating margin.

Aerospace & Electronics sales decreased $12.4 million, or 1.9%, to $638.3 million in 2021. The commercial market and military market accounted for 52% and 48%, respectively, of total segment sales in 2021. Sales to OEM and aftermarket customers in 2021 were 74% and 26% of total sales, respectively.

- Sales of Commercial Original Equipment increased by $3.0 million, or 1.3%, to $229.4 million in 2021.
- Sales of Military Original Equipment decreased by $19.0 million, or 7.3%, to $239.7 million in 2021, primarily reflecting challenging comparisons to particularly strong sales growth during the prior three years.
- Sales of Commercial Aftermarket increased by $11.5 million, or 12.4%, to $104.5 million in 2021, primarily reflecting higher demand driven by a rebound in commercial air traffic following the 2020 impact of COVID-19.
- Sales of Military Aftermarket decreased by $7.9 million, or 10.9%, to $64.7 million in 2021, primarily reflecting particularly strong sales in the prior year.

Aerospace & Electronics operating profit increased by $9.3 million, or 9.2%, to $110.0 million in 2021, primarily as a result of savings from 2020 repositioning actions of $19.0 million and productivity benefits of $16.5 million, largely offset by the impact of lower sales volumes of $21.3 million and $4.9 million of other items, net.

Process Flow Technologies

(in millions, except %) For the year ended December 31,	2021	2020	2019
Net sales by product line:			
Process Valves and Related Products	$ 717.1	$ 631.6	$ 685.1
Commercial Valves	374.2	286.3	332.1
Pumps and Systems	105.3	87.9	100.2
Total net sales	$ 1,196.6	$ 1,005.8	$ 1,117.4
Operating profit	$ 182.5	$ 97.7	$ 131.7
Acquisition-related and integration charges [(a)]	$ —	$ 6.3	$ 0.6
Restructuring and related (gains) charges, net [(a)]	$ (5.9)	$ 10.5	$ 19.2
Assets	$ 1,240.4	$ 1,106.1	$ 941.6
Backlog	$ 357.9	$ 313.4	$ 267.0
Operating margin	15.2 %	9.7 %	11.8 %

(a) Acquisition-related and integration charges and restructuring and related (gains) charges, net are included in operating profit and operating margin.

Process Flow Technologies sales increased by $190.8 million, or 19.0%, to $1,196.6 million in 2021, driven by higher core sales of $145.2 million, or 14.5%, favorable foreign currency translation of $40.6 million, or 4.0% and a benefit from the January 2020 acquisition of Instrumentation & Sampling ("I&S") of $5.0 million, or 0.5%.

- Sales of Process Valves and Related Products increased by $85.5 million, or 13.5%, to $717.1 million in 2021. The increase reflected higher core sales of $66.2 million, or 10.4%, favorable foreign currency translation of $14.3 million, or 2.3%, primarily reflecting the strengthening of the euro against the U.S. dollar, and a benefit from the acquisition of I&S of $5.0 million, or 0.8%. The higher core sales primarily reflected broad based strengthening across chemical, pharmaceutical, and general industrial end markets that continue to recover from the 2020 impact of COVID-19.
- Sales of Commercial Valves increased by $87.9 million, or 30.7%, to $374.2 million in 2021 primarily driven by a core sales increase of $62.3 million, or 21.8%, and favorable foreign currency translation of $25.6 million, or 8.9%, as the Canadian dollar and British pound strengthened against the U.S. dollar. The higher core sales reflected higher demand in Canadian non-residential construction markets, and to a lesser extent, higher demand in UK non-residential construction markets.
- Sales of Pumps and Systems increased by $17.4 million, or 19.8%, to $105.3 million in 2021, primarily reflecting higher demand from municipal and non-residential construction end markets.

Process Flow Technologies operating profit increased by $84.8 million, or 86.8%, to $182.5 million in 2021. The increase primarily reflected the impact of higher sales volumes of $45.2 million, productivity benefits of $24.7 million, the absence of acquisition-related and integration charges of $6.3 million, lower restructuring costs of $16.4 million which included a gain on the sale of real estate related to prior repositioning actions, partially offset by $7.8 million of other items, net.

PAYMENT & MERCHANDISING TECHNOLOGIES

(in millions, except %) For the year ended December 31,	2021	2020	2019
Net sales by product line:			
Payment Acceptance and Dispensing Products	$ 805.7	$ 670.8	$ 805.5
Banknotes and Security Products	539.4	434.0	352.8
Total net sales	$ 1,345.1	$ 1,104.8	$ 1,158.3
Operating profit	$ 307.5	$ 100.6	$ 177.3
Acquisition-related and integration charges [a]	$ —	$ 6.5	$ 2.4
Restructuring and related (gains) charges, net [a]	$ (3.7)	$ 19.8	$ 7.6
Assets	$ 2,096.5	$ 2,215.3	$ 2,303.4
Backlog	$ 438.0	$ 347.6	$ 311.4
Operating margin	22.9 %	9.1 %	15.3 %

(a) Acquisition-related and integration charges and restructuring and related (gains) charges, net are included in operating profit and operating margin.

Payment & Merchandising Technologies sales increased $240.3 million, or 21.8%, to $1,345.1 million in 2021, reflecting higher core sales of $210.6 million, or 19.1%, and favorable foreign currency translation of $29.7 million, or 2.7%.

- Sales of Payment Acceptance and Dispensing Products increased $134.9 million, or 20.1%, to $805.7 million in 2021. The increase reflected higher core sales of $123.3 million, or 18.4%, and favorable foreign currency translation of $11.6 million, or 1.7%, primarily reflecting the strengthening of the British pound against the U.S. dollar. The core sales increase primarily reflected higher sales to gaming, retail, vending and transportation customers as end markets continued to recover from the 2020 impact of COVID-19.
- Sales of Banknotes and Security Products increased $105.4 million, or 24.3%, to $539.4 million in 2021. The increase reflected higher core sales of $87.3 million, or 20.1%, and favorable foreign currency translation of $18.1 million, or 4.2%, as the euro strengthened against the U.S. dollar. The core sales increase reflected substantially higher sales of banknotes, globally.

Payment & Merchandising Technologies operating profit increased by $206.9 million, or 205.7%, to $307.5 million in 2021. The increase primarily reflected the impact of higher sales volumes of $100.7 million and, to a lesser extent, favorable mix of $41.9 million, productivity benefits of $34.7 million, lower restructuring and related costs of $23.5 million and acquisition-related and integration charges of $6.5 million which did not repeat in the current year, partially offset by $0.4 million of other items, net.

CORPORATE

(in millions) For the year ended December 31,	2021	2020	2019
Corporate expense	$ (97.7)	$ (58.8)	$ (67.4)
Corporate — Asbestos provision, net	—	—	(229.0)
Corporate — Environmental provision, net	—	—	(18.9)
Total Corporate expense	$ (97.7)	$ (58.8)	$ (315.3)
Acquisition-related and integration charges [a]	$ —	$ 0.1	$ 2.2

(a) Acquisition-related and integration charges are included in Corporate expense

Total Corporate expense increased by $38.9 million, or 66.2%, in 2021 primarily related to higher compensation and benefit costs of $19.0 million and transaction related expenses of $8.2 million.

INTEREST AND MISCELLANEOUS INCOME, NET

(in millions) For the year ended December 31,	2021	2020	2019
Interest income	$ 1.4	$ 2.0	$ 2.7
Interest expense	$ (46.9)	$ (55.3)	$ (46.8)
Miscellaneous income, net	$ 20.5	$ 14.9	$ 4.9

Interest expense decreased $8.4 million, or 15.2%, resulting from the absence of interest paid for the 364-day credit facility that was paid in April 2021 and lower amounts outstanding under the commercial paper facility beginning in the second quarter of 2021 . Miscellaneous income, net, increased $5.6 million, or 37.6%, primarily reflecting a gain on sale of a property.

INCOME TAX

(in millions, except %) For the year ended December 31,	2021	2020	2019
Income before tax — U.S.	$ 316.5	$ 102.2	$ 37.2
Income before tax — non-U.S.	160.7	99.6	106.7
Income before tax — worldwide	$ 477.2	$ 201.8	$ 143.9
Provision for income taxes	$ 82.9	$ 38.6	$ 31.3
Effective tax rate	17.4 %	19.1 %	21.7 %

Our effective tax rate is affected by a number of items, both recurring and discrete, including the amount of income we earn in different jurisdictions and their respective statutory tax rates, acquisitions and dispositions, changes in the valuation of our deferred tax assets and liabilities, changes in tax laws, regulations and accounting principles, the continued availability of statutory tax credits and deductions, and examinations initiated by tax authorities around the world. See "Application of Critical Accounting Policies" included later in this Item 7 for additional information about our provision for income taxes. A reconciliation of the statutory U.S. federal tax rate to our effective tax rate is set forth in Item 8 under Note 10, "Income Taxes" in the Notes to Consolidated Financial Statements.

LIQUIDITY AND CAPITAL RESOURCES

(in millions) For the year ended December 31,	2021	2020	2019
Net cash (used for) provided by:			
Operating activities from continuing operations	$ 466.7	$ 284.1	$ 370.4
Investing activities from continuing operations	1.9	(228.0)	(216.6)
Financing activities from continuing operations	(557.9)	55.1	(124.6)
Discontinued operations	29.6	24.3	19.0
Effect of exchange rates on cash and cash equivalents	(12.7)	21.6	2.3
(Decrease) increase in cash and cash equivalents	$ (72.4)	$ 157.1	$ 50.5

Our operating philosophy is to deploy cash provided from operating activities, when appropriate, to provide value to shareholders by reinvesting in existing businesses, by making acquisitions that will strengthen and complement our portfolio, by divesting businesses that are no longer strategic or aligned with our portfolio and where such divestitures can generate capacity for strategic investments and initiatives that further optimize our portfolio, and by paying dividends and/or repurchasing shares. At any given time, and from time to time, we may be evaluating one or more of these opportunities, although we cannot assure you if or when we will consummate any such transaction.

Our current cash balance, together with cash we expect to generate from future operations along with our commercial paper program or borrowings available under our revolving credit facility is expected to be sufficient to finance our short- and long-term capital requirements, as well as to fund payments associated with our asbestos and environmental liabilities and expected pension contributions. In addition, we believe our investment grade credit ratings afford us adequate access to public and private debt markets.

In July 2021, we entered into a $650 million, 5-year Revolving Credit Agreement, which replaced the existing $550 million revolving credit facility. We also increased the size of our Commercial Paper Program ("CP Program") to permit the issuance of short-term, unsecured commercial paper notes in an aggregate principal amount outstanding not to exceed $650 million at any time (up from $550 million, previously). See Item 8 under Note 14, "Financing," in the Notes to Consolidated Financial Statements for details regarding our financing arrangements.

On April 15, 2021, we repaid the amount outstanding under the 364-Day Credit Agreement which we entered into to enhance financial flexibility and maintain maximum liquidity in response to the uncertainty in the global markets resulting from the COVID-19 pandemic.

Operating Activities

Cash provided by operating activities from continuing operations, a key source of our liquidity, was $466.7 million in 2021, compared to $284.1 million in 2020. The increase in cash provided by operating activities from continuing operations was primarily driven by higher net income, partially offset by higher asbestos-related payments. Net asbestos-related payments in 2021 and 2020 were $44.9 million and $31.1 million, respectively. In 2022, we expect to make payments related to asbestos settlement and defense costs, net of related insurance recoveries, of approximately $45 million.

Investing Activities

Cash flows relating to investing activities from continuing operations consist primarily of cash used for acquisitions, capital expenditures and cash provided by divestitures of businesses or assets. Cash provided by investing activities from continuing operations was $1.9 million in 2021, compared to cash used for investing activities from continuing operations of $228.0 million in 2020. Cash used for investing activities in 2020 was driven by the acquisition of I&S for $169.5 million. There were no similar acquisitions in 2021. In addition, there was $30 million of net proceeds from the sale of marketable securities in 2021 compared to $30 million of cash used for the purchase of marketable securities in 2020. Capital expenditures are made primarily for increasing capacity, replacing equipment, supporting new product development and improving information systems. We expect capital expenditures of approximately $60 million in 2022.

Financing Activities

Financing cash flows consist primarily of dividend payments to shareholders, share repurchases, repayments of indebtedness, proceeds from the issuance of long-term debt and commercial paper and proceeds from the issuance of common stock. Cash used for financing activities from continuing operations was $557.9 million in 2021, compared to cash provided by financing activities from continuing operations of $55.1 million in 2020. The increase in cash used for financing activities from continuing operations was driven by the $348.1 million repayment of the outstanding amount under the 364-Day Credit Agreement in 2021, compared to proceeds of $343.9 million received from the same 364-Day Credit Agreement in 2020.

Financing Arrangements

Total debt was $842.4 million and $1,218.6 million as of December 31, 2021 and 2020, respectively. Our indebtedness as of December 31, 2021 was as follows:

- $299.4 million of 4.45% notes due 2023;
- $198.5 million of 6.55% notes due 2036; and
- $346.3 million of 4.20% notes due 2048.

As of December 31, 2021, our total debt to total capitalization ratio was 31.5%, computed as follows:

(in millions)		
Total long-term debt	$	842.4
Total shareholders' equity		1,832.3
Capitalization	$	2,674.7
Total indebtedness to capitalization		31.5 %

See Item 8 under Note 14, "Financing," in the Notes to Consolidated Financial Statements for details regarding our financing arrangements.

Credit Ratings

As of December 31, 2021, our senior unsecured debt was rated BBB by S&P Global Ratings with a Stable outlook and Baa2 with a Stable outlook by Moody's Investors Service. We believe that these ratings afford us adequate access to the public and private debt markets.

Contractual Obligations

Under various agreements, we are obligated to make future cash payments in fixed amounts. These include payments under our long-term debt agreements and rent payments required under operating lease agreements. The following table summarizes our fixed cash obligations as of December 31, 2021:

	Payment due by Period				
(in millions)	Total	2022	2023 -2024	2025 -2026	2027 and after
Debt [(a)]	$ 850.0	$ —	$ 300.0	$ —	$ 550.0
Fixed interest payments	606.3	41.2	68.4	55.6	441.1
Operating lease payments	137.1	25.5	40.2	23.2	48.2
Purchase obligations	188.8	152.0	29.4	4.3	3.1
Pension and postretirement benefits [(b)]	579.1	56.2	112.4	116.8	293.7
Other long-term liabilities reflected on Consolidated Balance Sheets [(c)]	—	—	—	—	—
Total	$ 2,361.3	$ 274.9	$ 550.4	$ 199.9	$ 1,336.1

(a) Debt includes scheduled principal payments.

(b) Pension benefits are funded by the respective pension trusts. The postretirement benefit component of the obligation is approximately $2.4 per year for which there is no trust and will be directly funded by us. Pension benefits are included through 2029.

(c) As the timing of future cash outflows is uncertain, the following long-term liabilities (and related balances) are excluded from the above table: Long-term asbestos liability ($549.8), long-term environmental liability ($25.8) and gross unrecognized tax benefits ($31.6) and related gross interest and penalties ($4.9).

Capital Structure

The following table sets forth our capitalization:

(in millions, except %) December 31,	2021	2020
Short-term borrowings	$ —	$ 375.7
Long-term debt	842.4	842.9
Total debt	842.4	1,218.6
Less cash and cash equivalents	478.6	551.0
Net debt [(a)]	363.8	667.6
Equity	1,835.1	1,531.1
Net capitalization [(a)]	$ 2,198.9	$ 2,198.7
Net debt to equity [(a)]	19.8%	43.6%
Net debt to net capitalization [(a)]	16.5%	30.4%

(a) Net debt, a non-GAAP measure, represents total debt less cash and cash equivalents. Net debt is comprised of components disclosed above which are presented on our Consolidated Balance Sheets. We report our financial results in accordance with U.S. generally accepted accounting principles (U.S. GAAP). However, management believes that certain non-GAAP financial measures, which include the presentation of net debt, provide useful information about our ability to satisfy our debt obligation with currently available funds. Management also uses these non-GAAP financial measures in making financial, operating, planning and compensation decisions and in evaluating our performance. Non-GAAP financial measures, which may be inconsistent with similarly captioned measures presented by other companies, should be viewed in the context of the definitions of the elements of such measures we provide and in addition to, and not as a substitute for, our reported results prepared and presented in accordance with U.S. GAAP.

In 2021, equity increased $304.0 million as a result of net income before allocation to noncontrolling interests of $435.4 million, changes in pension and post retirement plan assets and benefit obligations, net of tax of $96.0 million and the impact of equity-based awards and related settlement activities of $39.0 million. These increases were partially offset by cash dividends of $100.9 million, currency translation adjustment of $69.2 million and share repurchases of $96.3 million.

OUTLOOK - CONTINUING OPERATIONS

Overall

Our sales depend heavily on industries that are cyclical in nature or are subject to market conditions which may cause customer demand for our products to be volatile and unpredictable. Demand in these industries is affected by fluctuations in domestic and international economic conditions, as well as currency fluctuations, commodity costs, and a variety of other factors.

For 2022, we expect a total year-over-year sales increase of approximately 3% to 4%, driven by approximately 5% core growth, partially offset by a 1% to 2% impact from unfavorable foreign exchange. We expect an improvement in operating profit driven primarily by productivity benefits and operating leverage on higher volumes, partially offset by unfavorable mix.

Aerospace & Electronics

In 2022, we expect Aerospace & Electronics core sales to increase in the high-single digit range compared to 2021. We expect a substantial improvement in our commercial OEM business driven by higher aircraft build rates, and we expect a substantial improvement in our commercial aftermarket business given continued recovery in airline flight hours following two years of depressed demand due to the impacts of COVID-19. We expect our defense OEM to be flat and defense aftermarket businesses to be slightly lower given challenging comparisons to recent years where these markets exhibited very strong growth. We expect segment operating profit and operating margin to increase compared to 2021 driven primarily by the impact of operating leverage on higher volumes.

Process Flow Technologies

In 2022, we expect Process Flow Technologies sales to increase approximately 1% driven by approximately 3% core growth, partially offset by a 2% impact from unfavorable foreign exchange.

We expect Process Valves and Related Products sales to increase in the low- to mid-single digit range compared to 2021, driven by mid-single digit core sales growth, partially offset by a low-single digit impact from unfavorable foreign exchange. We expect Commercial Valves sales to decline in the mid-single digit range with a low-single digit decline in core sales and a low-single digit impact from unfavorable foreign exchange. We expect Pumps and Systems sales to increase in the high-single digit range compared to 2021, driven by strong demand across municipal and non-residential U.S. end markets.

We expect an improvement in the segment's operating profit and operating margin compared to 2021, driven by strong productivity and operating leverage on higher volumes.

Payment & Merchandising Technologies

In 2022, we expect Payment & Merchandising Technologies sales to increase in the low- to mid-single digit range compared to 2021, driven by mid-single digit core sales growth, partially offset by a low-single digit impact from unfavorable foreign exchange.

At Crane Payment Innovations, we expect core sales growth in the low-double digit range, driven by broad-based strength across all vertical markets. At Crane Currency, we expect core sales to decline in the high-single digit range compared to 2021 due to lower expected sales to international customers.

We expect the segment's operating profit to be similar compared to 2021, with higher prices and strong productivity approximately offset by inflationary pressures and unfavorable sales mix.

APPLICATION OF CRITICAL ACCOUNTING POLICIES

Our consolidated financial statements are prepared in accordance with accounting principles generally accepted in the United States. Our significant accounting policies are more fully described in Item 8 under Note 1, "Nature of Operations and Significant Accounting Policies" in the Notes to Consolidated Financial Statements. Certain accounting policies require us to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenue and expense during the reporting period. On an ongoing basis, we evaluate our estimates and assumptions, and the effects of revisions are reflected in the financial statements in the period in which they are determined to be necessary. The accounting policies described below are those that most frequently require us to make estimates and judgments and, therefore, are critical to understanding our results of operations. We have discussed the development and selection of these accounting estimates and the related disclosures with the Audit Committee of our Board of Directors.

Revenue Recognition. In accordance with Accounting Standards Codification ("ASC") Topic 606 "Revenue from Contracts with Customers," we recognize revenue when control of the promised goods or services in a contract transfers to the customer, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. We account for a contract when both parties have approved and committed to the terms, each party's rights and payment obligations under the contract are identifiable, the contract has commercial substance, and it is probable that we will collect substantially all of the consideration.

We primarily generate revenue through the manufacture and sale of engineered industrial products. Each product within a contract generally represents a separate performance obligation, as we do not provide a significant service of integrating or installing the products, the products do not customize each other, and the products can function independently of each other. Control of products generally transfers to the customer at a point in time, as the customer does not control the products as they are manufactured. We exercise judgment and consider the timing of right to payment, transfer of risk and rewards, transfer of title, transfer of physical possession, and customer acceptance when determining when control transfers to the customer. As a result, revenue from the sale of products is generally recognized at a point in time - either upon shipment or delivery - based on the specific shipping terms in the contract.

When products are customized or products are sold directly to the U.S. government or indirectly to the U.S. government through subcontracts, revenue is recognized over time because control is transferred continuously to customers, as the contract progresses. We exercise judgment to determine whether the products have an alternative use to us. When an alternative use does not exist for these products and we are entitled to payment for performance completed to date which includes a reasonable profit margin, revenue is recognized over time. When a contract with the U.S. government or subcontract for the U.S. government contains clauses indicating that the U.S. government owns any work-in-progress as the contracted product is being built, revenue is recognized over time. The measure of progress applied by us is the cost-to-cost method as this provides the most faithful depiction of the pattern of transfer of control. Under this method, we measure progress by comparing costs incurred to date to the total estimated costs to provide the performance obligation. This method effectively reflects our progress toward completion, as this methodology includes any work-in-process amounts as part of the measure of progress. Costs incurred represent work performed, which corresponds with, and thereby depicts, the transfer of control to the customer. Total revenue recognized and cost estimates are updated on a monthly basis.

Income Taxes. We account for income taxes in accordance with ASC Topic 740 "Income Taxes" ("ASC 740"), which requires an asset and liability approach for the financial accounting and reporting of income taxes. Under this method, deferred income taxes are recognized for the expected future tax consequences of differences between the tax bases of assets and liabilities and their reported amounts in the financial statements. These balances are measured using the enacted tax rates expected to apply in the year(s) in which these temporary differences are expected to reverse. The effect of a change in tax rates on deferred income taxes is recognized in income in the period when the change is enacted.

Based on consideration of all available evidence regarding their utilization, we record net deferred tax assets to the extent that it is more likely than not that they will be realized. Where, based on the weight of all available evidence, it is more likely than not that some amount of a deferred tax asset will not be realized, we establish a valuation allowance for the amount that, in our judgment, is sufficient to reduce the deferred tax asset to an amount that is more likely than not to be realized. The evidence we consider in reaching such conclusions includes, but is not limited to; (1) future reversals of existing taxable temporary differences, (2) future taxable income exclusive of reversing taxable temporary differences, (3) taxable income in prior carryback year(s) if carryback is permitted under the tax law, (4) cumulative losses in recent years, (5) a history of tax losses or credit carryforwards expiring unused, (6) a carryback or carryforward period that is so brief it limits realization of tax benefits, and (7) a strong earnings history exclusive of the loss that created the carryforward and support showing that the loss is an aberration rather than a continuing condition.

We account for unrecognized tax benefits in accordance with ASC 740, which prescribes a minimum probability threshold that a tax position must meet before a financial statement benefit is recognized. The minimum threshold is defined as a tax position that is more likely than not to be sustained upon examination by the applicable taxing authority, including resolution of any related appeals or litigation, based solely on the technical merits of the position. The tax benefit recognized is the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement.

We recognize interest and penalties related to unrecognized tax benefits within the income tax expense line of the Consolidated Statement of Operations, while accrued interest and penalties are included within the related tax liability line of the Consolidated Balance Sheets.

Goodwill and Other Intangible Assets. As of December 31, 2021, we had $1,412.5 million of goodwill and $465.9 million of net intangible assets, of which $70.6 million were intangibles with indefinite useful lives, consisting of trade names. As of December 31, 2020, we had $1,437.7 million of goodwill and $519.1 million of net intangible assets, of which $70.9 million were intangibles with indefinite useful lives, consisting of trade names.

Our business acquisitions have typically resulted in the recognition of goodwill and other intangible assets. We follow the provisions under ASC Topic 350, "Intangibles – Goodwill and Other" ("ASC 350") as it relates to the accounting for goodwill in the Consolidated Financial Statements. These provisions require that we, on at least an annual basis, evaluate the fair value of the reporting units to which goodwill is assigned and attributed and compare that fair value to the carrying value of the reporting unit to determine if an impairment has occurred. We perform our annual impairment testing during the fourth quarter. Impairment testing takes place more often than annually if events or circumstances indicate a change in status that would indicate a potential impairment. We believe that there have been no events or circumstances which would more likely than not reduce the fair value of our reporting units below its carrying value. A reporting unit is an operating segment unless discrete financial information is prepared and reviewed by segment management for businesses one level below that operating segment (a "component"), in which case the component would be the reporting unit. As of December 31, 2021, we had seven reporting units. In the second quarter of 2021, the assets and liabilities of our Engineered Materials segment (which is a separate reportable segment and reporting unit) were classified as held for sale. Please refer to Item 8 under 3, "Discontinued Operations" in the Notes to Consolidated Financial Statements for further discussion.

When performing our annual impairment assessment, we compare the fair value of each of our reporting units to our respective carrying value. Goodwill is considered to be potentially impaired when the net book value of the reporting unit exceeds its estimated fair value. Fair values are established primarily by discounting estimated future cash flows at an estimated cost of capital which varies for each reporting unit and which, as of our most recent annual impairment assessment, ranged between 9.5% and 11.5% (a weighted average of 10.7%), reflecting the respective inherent business risk of each of the reporting units tested. This methodology for valuing our reporting units (commonly referred to as the Income Method) has not changed since the adoption of the provisions under ASC 350. The determination of discounted cash flows is based on the businesses' strategic plans and long-range planning forecasts, which change from year to year. The revenue growth rates included in the forecasts represent best estimates based on current and forecasted market conditions. Profit margin assumptions are projected by each reporting unit based on the current cost structure and anticipated net cost increases/reductions. There are inherent uncertainties related to these assumptions, including changes in market conditions, and management judgment is necessary in applying them to the analysis of goodwill impairment. In addition to the foregoing, for each reporting unit, market multiples are used to corroborate discounted cash flow results where fair value is estimated based on earnings multiples determined by available public information of comparable businesses. While we believe we have made reasonable estimates and assumptions to calculate the fair value of our reporting units, it is possible a material change could occur. If actual results are not consistent with management's estimates and assumptions, goodwill and other intangible assets may then be determined to be overstated and a charge would need to be taken against net earnings. Furthermore, in order to evaluate the sensitivity of the fair value calculations on the goodwill impairment test, we applied a hypothetical, reasonably possible 10% decrease to the fair values of each reporting unit. The effects of this hypothetical 10% decrease would still result in a fair value calculation exceeding our carrying value for each of our reporting units. No impairment charges have been required during 2021, 2020 or 2019.

Intangibles with indefinite useful lives are tested annually for impairment, or when events or changes in circumstances indicate the potential for impairment. If the carrying amount of an indefinite lived intangible asset exceeds its fair value, the intangible asset is written down to its fair value. Fair value is calculated using relief from royalty method. We amortize the cost of definite-lived intangibles over their estimated useful lives.

In addition to annual testing for impairment of indefinite-lived intangible assets, we review all of our definite-lived intangible assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Examples of events or changes in circumstances could include, but are not limited to, a prolonged economic downturn, current period operating or cash flow losses combined with a history of losses or a forecast of continuing losses associated with the use of an asset or asset group, or a current expectation that an asset or asset group will be sold or disposed of before the end of its previously estimated useful life. Recoverability is based upon projections of anticipated future undiscounted cash flows associated with the use and eventual disposal of the definite-lived intangible asset (or asset group), as well as specific appraisal in certain instances. Reviews occur at the lowest level for which identifiable cash flows are largely independent of cash flows associated with other long-lived assets or asset groups and include estimated future revenues, gross profit margins, operating profit margins and capital expenditures which are based on the businesses' strategic plans and long-range planning forecasts, which change from year to year. The revenue growth rates included in the forecasts represent our best estimates based on current and forecasted market conditions, and the profit margin assumptions are based on the current cost structure and anticipated net cost increases or reductions. There are inherent uncertainties related to these assumptions, including changes in market conditions, and management's judgment in applying them to the analysis. If the future undiscounted cash flows are less than the carrying value, then the definite-lived intangible asset is considered impaired and a charge would be taken against net earnings based on the amount by which the carrying amount exceeds the estimated fair value. Judgments that we make which impact these assessments relate to the expected useful lives of definite-lived assets and its ability to realize any undiscounted cash flows in excess of the carrying amounts of such assets, and are affected primarily by changes in the expected use of the assets, changes in technology or development of alternative assets, changes in economic conditions, changes in operating performance and changes in expected future cash flows. Since judgment is involved in determining the recoverable amount of definite-lived intangible assets, there is risk that the carrying value of our definite-lived intangible assets may require adjustment in future periods. Historical results to date have generally approximated expected cash flows for the identifiable cash flow generating level. We believe there have been no events or circumstances which would more likely than not reduce the fair value of our indefinite-lived or definite-lived intangible assets below their carrying value.

Asbestos Liability and Related Insurance Coverage and Receivable. We retained an independent actuarial firm to assist management in estimating our asbestos liability in the tort system. The actuarial consultants review information provided by us concerning claims filed, settled and dismissed, amounts paid in settlements and relevant claim information such as the nature of the asbestos-related disease asserted by the claimant, the jurisdiction where filed and the time lag from filing to disposition of the claim. The methodology used by the actuarial consultants to project future asbestos costs is based on our recent historical experience for claims filed, settled and dismissed during a base reference period. Our experience is then compared to estimates of the number of individuals likely to develop asbestos-related diseases determined based on widely used previously conducted epidemiological studies augmented with current data inputs. Those studies were undertaken in connection with national analyses of the population of workers believed to have been exposed to asbestos. Using that information, the actuarial consultants estimate the number of future claims that would be filed against us and estimates the aggregate settlement or indemnity costs that would be incurred to resolve both pending and future claims based upon the average settlement costs by disease during the reference period. This methodology has been accepted by numerous courts. After discussions with us, the actuarial consultants augment our liability estimate for the costs of defending asbestos claims in the tort system using a forecast from us which is based upon discussions with our defense counsel. Based on this information, the actuarial consultants compile an estimate of our asbestos liability for pending and future claims using a range of reference periods based on claim experience and covering claims expected to be filed through the indicated forecast period. The most significant factors affecting the liability estimate are (1) the number of new mesothelioma claims filed against us, (2) the average settlement costs for mesothelioma claims, (3) the percentage of mesothelioma claims dismissed against us and (4) the aggregate defense costs incurred by us. These factors are interdependent, and no one factor predominates in determining the liability estimate. These factors have both positive and negative effects on the dynamics of asbestos litigation in the tort system and the related best estimate of our asbestos liability, and these effects do not move in a linear fashion but rather change over multi-year periods. Accordingly, we continue to monitor these trend factors over time and periodically assesses whether an alternative forecast period is appropriate.

With the assistance of our actuarial consultants, effective as of December 31, 2019, we updated our estimate of the asbestos liability, including the costs of settlement or indemnity payments and defense costs relating to currently pending claims and future claims projected to be filed against us through 2059. Our estimate of the asbestos liability for pending and future claims through 2059 is based on the projected future asbestos costs resulting from our experience using a range of reference periods for claims filed, settled and dismissed. Based on this estimate, we recorded an additional liability of $255 million (an aggregate asbestos liability of $712 million) as of December 31, 2019. Estimation of our exposure for asbestos-related claims is subject to significant uncertainties, as there are multiple variables that can affect the timing, severity and quantity of claims and the manner of their resolution.

Management has made its best estimate of the costs through 2059. Through December 31, 2021, our actual experience during the updated reference period for mesothelioma claims filed and dismissed generally approximated the assumptions in our liability estimate. In addition to this claims experience, we considered additional quantitative and qualitative factors such as the nature of the aging of pending claims, significant appellate rulings and legislative developments, and their respective effects on expected future settlement values. Based on this evaluation, we determined that no change in the estimate was warranted for the period ended December 31, 2021. The liability was $612 million and $670 million as of December 31, 2021 and 2020, respectively.

In conjunction with developing the aggregate liability estimate referenced above, we also developed an estimate of probable insurance recoveries for our asbestos liabilities. In developing this estimate, we considered our coverage-in-place and other settlement agreements, as well as a number of additional factors. These additional factors include the financial viability of the insurance companies, the method by which losses will be allocated to the various insurance policies and the years covered by those policies, how settlement and defense costs will be covered by the insurance policies and interpretation of the effect on coverage of various policy terms and limits and their interrelationships. As of December 31, 2021 and 2020, we had an aggregate asbestos insurance receivable of $74 million and $87 million, respectively.

Environmental. For environmental matters, we record a liability for estimated remediation costs when it is probable that we will be responsible for such costs and they can be reasonably estimated. Generally, third party specialists assist in the estimation of remediation costs. The environmental remediation liability as of December 31, 2021 is substantially all for the former manufacturing site in Goodyear, Arizona (the "Goodyear Site"). Estimates of our environmental liabilities at the Goodyear Site are based on currently available facts, present laws and regulations and current technology available for remediation, and are recorded on an undiscounted basis. These estimates consider our prior experience in the Goodyear Site investigation and remediation, as well as available data from, and in consultation with, our environmental specialists. Estimates at the Goodyear Site are subject to significant uncertainties caused primarily by the dynamic nature of the Goodyear Site conditions, the range of remediation alternatives available, together with the corresponding estimates of cleanup methodology and costs, as well as ongoing, required regulatory approvals, primarily from the EPA. During the fourth quarter of 2019, we received conceptual agreement from the EPA on an alternative remediation strategy which is expected to further reduce the contaminant plume. Accordingly, we recorded a pre-tax charge of $18.9 million, net of reimbursements, to extend our forecast period through 2027 and reflect our revised workplan. The total estimated gross liability was $32.3 million and $39.8 million as of December 31, 2021 and 2020, respectively.

On July 31, 2006, we entered into a consent decree with the U.S. Department of Justice on behalf of the Department of Defense and the Department of Energy pursuant to which, among other things, the U.S. Government reimburses us for 21% of qualifying costs of investigation and remediation activities at the Goodyear Site. We have recorded a receivable of $7.3 million and $7.8 million for the expected reimbursements from the U.S. Government in respect of the aggregate liability as of December 31, 2021 and 2020, respectively.

Pension Plans. In the United States, we sponsor a defined benefit pension plan that covers approximately 16% of all U.S. employees. Effective January 1, 2013, pension eligible non-union employees no longer earn future benefits in the domestic defined benefit pension plan. The benefits are based on years of service and compensation on a final average pay basis, except for certain hourly employees where benefits are fixed per year of service. Charges to expense are based upon costs computed by an independent actuary. Contributions are intended to provide for future benefits earned to date. Additionally, a number of our non-U.S. subsidiaries sponsor defined benefit pension plans that cover approximately 9% of all non-U.S. employees. The benefits are typically based upon years of service and compensation. Most of these plans are funded by company contributions to pension funds, which are held for the sole benefit of plan participants and beneficiaries.

The expected return on plan assets component of net periodic benefit cost is determined by applying the assumed expected return on plan assets to the fair value of plan assets. For one of the U.K. pension plans, a market-related value of assets is used in lieu of the fair value of plan assets for this purpose. The net actuarial loss (gain) is amortized to the extent that it exceeds 10% of the greater of the fair value of plan assets and the projected benefit obligation. The amortization period is the average life expectancy of plan participants for most plans. The amortization period for plans with a significant number of active participants accruing benefits is the average future working lifetime of plan participants. The prior service cost (credit) is amortized over the average future working lifetime of plan participants whose prior service benefits were changed.

The net periodic pension benefit was $6.8 million, $6.8 million and $0.6 million in 2021, 2020 and 2019, respectively. The net periodic pension benefit was the same in 2021 compared to 2020, driven by lower interest costs for both U.S. and non U.S. plans offset by higher amortization of a net loss. Employer cash contributions were $26.7 million, $26.1 million and $4.2 million in 2021, 2020 and 2019, respectively.

Holding all other factors constant, a decrease in the expected long-term rate of return on plan assets by 0.25 percentage points would have increased 2021 pension expense by $1.2 million for U.S. pension plans and $1.3 million for non-U.S. pension plans. Also, holding all other factors constant, a decrease in the discount rate used to determine net periodic pension cost by 0.25 percentage points would have decreased 2021 pension expense by $0.2 million for U.S. pension plans and increased 2021 pension expense by $0.8 million for non-U.S. pension plans.

The weighted average assumptions used to determine benefit obligations and net periodic benefit cost are as follows:

	Pension Benefits		
For the year ended December 31,	2021	2020	2019
Benefit Obligations			
U.S. Plans:			
Discount rate	2.89 %	2.62 %	3.34 %
Rate of compensation increase	N/A	N/A	N/A
Interest credit rate	1.47 %	0.93 %	2.83 %
Non-U.S. Plans:			
Discount rate	1.58 %	1.07 %	1.70 %
Rate of compensation increase	3.08 %	3.10 %	2.89 %
Interest credit rate	0.33 %	0.29 %	0.22 %
Net Periodic Benefit Cost			
U.S. Plans:			
Discount rate	2.62 %	3.34 %	4.36 %
Expected rate of return on plan assets	6.50 %	7.25 %	7.25 %
Rate of compensation increase	N/A	N/A	N/A
Interest credit rate	0.93 %	2.83 %	2.40 %
Non-U.S. Plans:			
Discount rate	1.07 %	1.70 %	2.42 %
Expected rate of return on plan assets	4.45 %	5.31 %	5.34 %
Rate of compensation increase	3.10 %	2.89 %	3.06 %
Interest credit rate	0.29 %	0.22 %	0.84 %

The long-term expected rate of return on plan assets assumptions were determined with input from independent investment consultants and plan actuaries, utilizing asset pricing models and considering historic returns. The discount rates we used for valuing pension liabilities are based on a review of high-quality corporate bond yields with maturities approximating the remaining life of the projected benefit obligation.

Recent Accounting Pronouncements

Information regarding new accounting pronouncements is included in Item 8 under Note 1 to the Consolidated Financial Statements.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Our cash flows and earnings are subject to fluctuations from changes in interest rates and foreign currency exchange rates. We manage our exposures to these market risks through internally established policies and procedures and, when deemed appropriate, through the use of interest-rate swap agreements and forward exchange contracts. We do not enter into derivatives or other financial instruments for trading or speculative purposes.

Total debt outstanding was $842.4 million as of December 31, 2021, which was at fixed rates of interest ranging from 4.20% to 6.55%.

The following is an analysis of the potential changes in interest rates and currency exchange rates based upon sensitivity analysis that models effects of shifts in rates. These are not forecasts.

- Our year-end portfolio is comprised of fixed-rate debt; therefore, the effect of a market change in interest rates would not be significant.
- Based on a sensitivity analysis as of December 31, 2021, a 10% change in the foreign currency exchange rates for the year ended December 31, 2021 would have impacted our net earnings by approximately $15.2 million, due primarily to the British pound, euro and Canadian dollar. This calculation assumes that all currencies change in the same direction and proportion relative to the U.S. dollar and there are no indirect effects, such as changes in non-U.S. dollar sales volumes or prices.

Item 8. Financial Statements and Supplementary Data

MANAGEMENT'S RESPONSIBILITY FOR FINANCIAL REPORTING

The accompanying consolidated financial statements of Crane Co. and subsidiaries have been prepared by management in conformity with accounting principles generally accepted in the United States of America and, in the judgment of management, present fairly and consistently the Company's financial position and results of operations and cash flows. These statements by necessity include amounts that are based on management's best estimates and judgments and give due consideration to materiality.

Management is responsible for establishing and maintaining adequate internal control over financial reporting. The Company's internal control system was designed to provide reasonable assurance to the Company's management and board of directors regarding the preparation and fair presentation of published financial statements.

All internal control systems, no matter how well designed, have inherent limitations. Therefore, even those systems determined to be effective can provide only reasonable assurance with respect to financial statement preparation and presentation.

Management assessed the effectiveness of the Company's internal control over financial reporting as of December 31, 2021. In making its assessment, management has utilized the criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission in its Internal Control—Integrated Framework, released in 2013. Based on our assessment we believe that, as of December 31, 2021, the Company's internal control over financial reporting is effective based on those criteria.

Deloitte & Touche LLP, the independent registered public accounting firm that also audited the Company's consolidated financial statements included in this Annual Report on Form 10-K, audited the internal control over financial reporting as of December 31, 2021, and issued their related attestation report which is included herein.

/s/ Max H. Mitchell

Max H. Mitchell
President and Chief Executive Officer
(Principal Executive Officer)

/s/ Richard A. Maue

Richard A. Maue
Senior Vice President and Chief Financial Officer
(Principal Financial Officer)

The Section 302 certifications of the Company's Chief Executive Officer and its Principal Financial Officer have been filed as Exhibit 31 to the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2021.

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Crane Co.

Opinion on the Financial Statements

We have audited the accompanying consolidated balance sheets of Crane Co. & subsidiaries (the "Company") as of December 31, 2021 and 2020, the related consolidated statements of operations, comprehensive income, cash flows, and changes in equity, for each of the three years in the period ended December 31, 2021 and the related notes (collectively referred to as the "financial statements"). In our opinion, the financial statements present fairly, in all material respects, the financial position of the Company as of December 31, 2021 and 2020, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2021, in conformity with accounting principles generally accepted in the United States of America.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the Company's internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission and our report dated February 28, 2022, expressed an unqualified opinion on the Company's internal control over financial reporting.

Basis for Opinion

These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on the Company's financial statements based on our audits. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement, whether due to error or fraud. Our audits included performing procedures to assess the risks of material misstatement of the financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the financial statements. We believe that our audits provide a reasonable basis for our opinion.

Critical Audit Matter

The critical audit matter communicated below is a matter arising from the current-period audit of the financial statements that was communicated or required to be communicated to the audit committee and that (1) relates to accounts or disclosures that are material to the financial statements and (2) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Asbestos Liability — Refer to Note 13, Commitments and Contingencies, to the financial statements

Critical Audit Matter Description

The Company is a defendant in cases filed in numerous state and federal courts alleging injury or death of exposure to asbestos. The Company records an estimated liability related to the resolution cost of pending and future claims projected to be filed against the Company for which management believes are probable of occurring and reasonably estimable. The model utilized by the Company to estimate its asbestos liability has several factors that involve the application of significant judgement and estimates with a significant measurement of uncertainty. The most significant factors affecting the asbestos liability are (1) the number of new mesothelioma claims filed against the Company, (2) the average settlement costs for mesothelioma claims, (3) the percentage of mesothelioma claims dismissed against the Company and (4) the aggregate defense costs incurred by the Company. These factors are interdependent, and no one factor predominates in determining the liability estimate. Changes in these estimates and assumptions could have a significant impact on the asbestos liability. The current and non-current liability as of December 31, 2021 was $62.3 million and $549.8 million, respectively.

Given the subjectivity of estimating the asbestos liability, future claims, and underlying assumptions utilized by management, auditing management's judgments regarding the significant factors listed above involved especially subjective auditor judgment, including the need to involve our actuarial specialists.

How the Critical Audit Matter Was Addressed in the Audit

Our audit procedures performed on the recorded asbestos liability included the following, among others:

- We tested the design and effectiveness of controls over the asbestos liability, including those over the projection of settlement value of current and future claims.
- We obtained the System and Organization Control Report (SOC) 1 reports for the outside service providers to evaluate the processes and controls relevant to the Company's asbestos claims administration.
- With the assistance of our internal actuarial specialists, we:
  - Evaluated the reasonableness of the underlying methodology for estimating the liability.
  - Tested the completeness and accuracy of underlying source data that served as the basis for the actuarial analysis and estimates, including historical claims, to test that the inputs to the actuarial estimate were reasonable.
  - Compared management's prior-year assumptions of expected development and ultimate loss to actual incurred during the current year to identify potential bias in the determination of the liability.
  - We assessed the reasonableness of the forecast period used by the Company to estimate the liability.
  - Developed a range of independent estimates based on loss information and historical and industry claim development factors and compared our estimates to the Company's estimates.
- We considered the impact of changes in the regulatory and litigation environments on management's assumptions by performing corroborating inquires with the Company's internal and external legal counsel.
- We evaluated management's ability to accurately estimate the future liability by comparing actual results to management's historical estimates.

/s/ Deloitte & Touche LLP
Stamford, Connecticut
February 28, 2022

We have served as the Company's auditor since 1979.

CONSOLIDATED STATEMENTS OF OPERATIONS

	For the year ended December 31,		
(in millions, except per share data)	2021	2020	2019
Net sales	$ 3,180.0	$ 2,761.3	$ 3,074.5
Operating costs and expenses:			
Cost of sales	1,939.0	1,796.2	1,942.2
Selling, general and administrative	755.6	680.3	678.6
Restructuring (gains) charges, net	(16.9)	31.7	17.5
Acquisition-related and integration charges	—	12.9	5.2
Asbestos provision, net	—	—	229.0
Environmental provision, net	—	—	18.9
Operating profit	502.3	240.2	183.1
Other income (expense):			
Interest income	1.4	2.0	2.7
Interest expense	(46.9)	(55.3)	(46.8)
Miscellaneous income, net	20.5	14.9	4.9
Total other expense	(25.1)	(38.4)	(39.2)
Income from continuing operations before income taxes	477.2	201.8	143.9
Provision for income taxes	82.9	38.6	31.3
Net income from continuing operations before allocation to noncontrolling interests	394.3	163.2	112.6
Less: Noncontrolling interest in subsidiaries' earnings	—	0.1	0.3
Net income from continuing operations attributable to common shareholders	394.3	163.1	112.3
Income from discontinued operations, net of tax (Note 3)	41.1	17.9	21.0
Net income attributable to common shareholders	$ 435.4	$ 181.0	$ 133.3
Earnings per basic share:			
Earnings per basic share from continuing operations	$ 6.76	$ 2.79	$ 1.88
Earnings per basic share from discontinued operations	0.70	0.31	0.35
Earnings per basic share	$ 7.46	$ 3.10	$ 2.23
Earnings per diluted share:			
Earnings per diluted share from continuing operations	$ 6.66	$ 2.77	$ 1.85
Earnings per diluted share from discontinued operations	0.70	0.31	0.35
Earnings per diluted share	$ 7.36	$ 3.08	$ 2.20
Average shares outstanding:			
Basic	58.4	58.3	59.8
Diluted	59.2	58.8	60.6

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF COMPREHENSIVE INCOME

	For the year ended December 31,		
(in millions)	2021	2020	2019
Net income before allocation to noncontrolling interests	$ 435.4	$ 181.1	$ 133.6
Components of other comprehensive income (loss), net of tax			
Currency translation adjustment	(69.2)	70.4	11.5
Changes in pension and postretirement plan assets and benefit obligation, net of tax	96.0	(53.6)	(47.7)
Other comprehensive income (loss), net of tax	26.8	16.8	(36.2)
Comprehensive income before allocation to noncontrolling interests	462.2	197.9	97.4
Less: Noncontrolling interests in comprehensive income (loss)	0.6	(0.5)	(0.1)
Comprehensive income attributable to common shareholders	$ 461.6	$ 198.4	$ 97.5

See Notes to Consolidated Financial Statements

CONSOLIDATED BALANCE SHEETS

	Balance as of December 31,	
(in millions, except shares and per share data)	2021	2020
Assets		
Current assets:		
Cash and cash equivalents	$ 478.6	$ 551.0
Current insurance receivable - asbestos	13.7	14.4
Accounts receivable, net	472.4	423.9
Inventories, net	440.9	429.7
Other current assets	118.1	137.3
Current assets held for sale	220.5	17.4
Total current assets	1,744.2	1,573.7
Property, plant and equipment, net	527.3	573.7
Insurance receivable - asbestos	60.0	72.5
Long-term deferred tax assets	17.7	41.0
Intangible assets, net	465.9	519.1
Goodwill	1,412.5	1,437.7
Other assets	259.0	197.4
Long-term assets held for sale	—	199.9
Total assets	$ 4,486.6	$ 4,615.0
Liabilities and equity		
Current liabilities:		
Short-term borrowings	$ —	$ 375.7
Accounts payable	246.7	198.9
Current asbestos liability	62.3	66.5
Accrued liabilities	430.7	388.0
U.S. and foreign taxes on income	10.6	0.1
Current liabilities held for sale	44.9	27.4
Total current liabilities	795.2	1,056.6
Long-term debt	842.4	842.9
Accrued pension and postretirement benefits	231.9	329.7
Long-term deferred tax liability	71.1	53.6
Long-term asbestos liability	549.8	603.6
Other liabilities	161.1	171.3
Long-term liabilities held for sale	—	26.2
Commitments and contingencies (Note 13)		
Equity:		
Preferred shares, par value 0.01; 5,000,000 shares authorized	—	—
Common shares, par value $1.00; 200,000,000 shares authorized; 72,426,139 shares issued; 57,835,865 and 58,127,948 shares outstanding in 2021 and 2020, respectively	72.4	72.4
Capital surplus	363.9	330.7
Retained earnings	2,527.3	2,192.8
Accumulated other comprehensive loss	(440.2)	(466.4)
Treasury stock; 14,590,274 and 14,298,191 treasury shares in 2021 and 2020, respectively	(691.1)	(600.6)
Total shareholders' equity	1,832.3	1,528.9
Noncontrolling interest	2.8	2.2
Total equity	1,835.1	1,531.1
Total liabilities and equity	$ 4,486.6	$ 4,615.0

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF CASH FLOWS

(in millions)	For the year ended December 31, 2021	2020	2019
Operating activities from continuing operations:			
Net income from continuing operations attributable to common shareholders	$ 394.3	$ 163.1	$ 112.3
Asbestos provision, net	—	—	229.0
Environmental provision, net	—	—	18.9
Loss on deconsolidation of joint venture	—	—	1.2
Realized gain on marketable securities	—	—	(1.1)
Gain on sale of property	(18.5)	—	—
Depreciation and amortization	119.5	123.8	107.9
Stock-based compensation expense	24.5	21.8	21.8
Defined benefit plans and postretirement credit	(8.0)	(7.1)	(0.7)
Deferred income taxes	10.8	16.0	(28.3)
Cash provided by (used for) operating working capital	29.7	37.8	(33.2)
Defined benefit plans and postretirement contributions	(29.4)	(28.4)	(8.7)
Environmental payments, net of reimbursements	(5.8)	(4.2)	(8.2)
Asbestos related payments, net of insurance recoveries	(44.9)	(31.1)	(41.5)
Other	(5.5)	(7.6)	1.0
Total provided by operating activities from continuing operations	$ 466.7	$ 284.1	$ 370.4
Investing activities from continuing operations:			
Payment for acquisition - net of cash acquired	—	(169.5)	(156.2)
Proceeds from disposition of capital assets	23.6	4.4	3.1
Capital expenditures	(51.7)	(32.9)	(64.4)
Purchase of marketable securities	(10.0)	(90.0)	(8.8)
Proceeds from sale of marketable securities	40.0	60.0	9.9
Impact of deconsolidation of joint venture	—	—	(0.2)
Total provided by (used for) investing activities from continuing operations	$ 1.9	$ (228.0)	$ (216.6)
Financing activities from continuing operations:			
Dividends paid	(100.6)	(100.4)	(93.2)
Reacquisition of shares on open market	(96.3)	(70.0)	(79.9)
Stock options exercised, net of shares reacquired	14.2	5.1	2.9
Debt issuance costs	—	(1.3)	—
Repayment of long-term debt	—	—	(99.4)
Repayment of short-term debt	—	—	(7.4)
Proceeds from issuance of long-term debt	—	—	3.0
Proceeds from issuance of commercial paper with maturities greater than 90 days	—	251.3	25.0
Repayments of commercial paper with maturities greater than 90 days	(27.1)	(296.7)	—
Net (repayments) proceeds from issuance of commercial paper with maturities of 90 days or less	—	(76.8)	124.4
Proceeds from revolving credit facility	—	77.2	—
Repayments of revolving credit facility	—	(77.2)	—
Proceeds from term loan	—	343.9	—
Repayment of term loan	(348.1)	—	—
Total (used for) provided by financing activities from continuing operations	$ (557.9)	$ 55.1	$ (124.6)
Discontinued operations:			
Total provided by operating activities	31.8	25.4	23.4
Total used for investing activities	(2.2)	(1.1)	(4.4)
Increase in cash and cash equivalents from discontinued operations	$ 29.6	$ 24.3	$ 19.0

	For the year ended December 31,		
(in millions)	2021	2020	2019
Effect of exchange rates on cash and cash equivalents	$ (12.7)	$ 21.6	$ 2.3
(Decrease) increase in cash and cash equivalents	(72.4)	157.1	50.5
Cash and cash equivalents at beginning of period	551.0	393.9	343.4
Cash and cash equivalents at end of period	$ 478.6	$ 551.0	$ 393.9
Detail of cash provided by (used for) operating working capital from continuing operations:			
Accounts receivable	$ (57.0)	$ 139.2	$ 1.9
Inventories	(18.5)	35.2	(8.8)
Other current assets	(18.0)	(5.8)	(1.2)
Accounts payable	51.8	(103.1)	(13.6)
Accrued liabilities	51.1	3.5	(35.9)
U.S. and foreign taxes on income	20.3	(31.2)	24.4
Total	$ 29.7	$ 37.8	$ (33.2)
Supplemental disclosure of cash flow information:			
Interest paid	$ 44.4	$ 53.8	$ 47.4
Income taxes paid	$ 56.3	$ 43.8	$ 35.1

See Notes to Consolidated Financial Statements

CONSOLIDATED STATEMENTS OF CHANGES IN EQUITY

(in millions, except share data)	Common Shares Issued at Par Value	Capital Surplus	Retained Earnings	Accumulated Other Comprehensive Loss	Treasury Stock	Total Shareholders' Equity	Noncontrolling Interest	Total Equity
BALANCE DECEMBER 31, 2018	72.4	$ 303.5	$ 2,072.1	$ (447.6)	$ (476.2)	$ 1,524.2	$ 2.9	$ 1,527.1
Net income	—	—	133.3	—	—	133.3	0.3	133.6
Cash dividends ($1.56 per share)	—	—	(93.2)	—	—	(93.2)	—	(93.2)
Reacquisition on open market of 987,630 shares	—	—	—	—	(79.9)	(79.9)	—	(79.9)
Exercise of stock options, net of shares reacquired of 218,540	—	—	—	—	11.5	11.5	—	11.5
Stock-based compensation	—	22.3	—	—	—	22.3	—	22.3
Impact from settlement of share-based awards, net of shares acquired	—	(10.2)	—	—	1.8	(8.4)	—	(8.4)
Deconsolidation of a joint venture	—	—	—	—	—	—	(0.5)	(0.5)
Changes in pension and postretirement plan assets and benefit obligation, net of tax	—	—	—	(47.7)	—	(47.7)	—	(47.7)
Currency translation adjustment	—	—	—	11.6	—	11.6	(0.1)	11.5
BALANCE DECEMBER 31, 2019	72.4	$ 315.6	$ 2,112.2	$ (483.7)	$ (542.8)	$ 1,473.7	$ 2.6	$ 1,476.3
Net income	—	—	181.0	—	—	181.0	0.1	181.1
Cash dividends ($1.72 per share)	—	—	(100.4)	—	—	(100.4)	—	(100.4)
Reacquisition on open market of 1,221,233 shares	—	—	—	—	(70.0)	(70.0)	—	(70.0)
Exercise of stock options, net of shares reacquired of 183,320	—	—	—	—	8.9	8.9	—	8.9
Stock-based compensation	—	22.3	—	—	—	22.3	—	22.3
Impact from settlement of share-based awards, net of shares acquired	—	(7.2)	—	—	3.3	(3.9)	—	(3.9)
Changes in pension and postretirement plan assets and benefit obligation, net of tax	—	—	—	(53.6)	—	(53.6)	—	(53.6)
Currency translation adjustment	—	—	—	70.9	—	70.9	(0.5)	70.4
BALANCE DECEMBER 31, 2020	72.4	$ 330.7	$ 2,192.8	$ (466.4)	$ (600.6)	$ 1,528.9	$ 2.2	$ 1,531.1
Net income	—	—	435.4	—	—	435.4	—	435.4
Cash dividends ($1.72 per share)	—	—	(100.9)	—	—	(100.9)	—	(100.9)
Reacquisition on open market of 943,048 shares	—	—	—	—	(96.3)	(96.3)	—	(96.3)
Exercise of stock options, net of shares reacquired of 553,655 shares	—	—	—	—	16.5	16.5	—	16.5
Stock-based compensation	—	24.9	—	—	—	24.9	—	24.9
Impact from settlement of share-based awards, net of shares acquired	—	8.3	—	—	(10.7)	(2.4)	—	(2.4)
Changes in pension and postretirement plan assets and benefit obligation, net of tax	—	—	—	96.0	—	96.0	—	96.0
Currency translation adjustment	—	—	—	(69.8)	—	(69.8)	0.6	(69.2)
BALANCE DECEMBER 31, 2021	72.4	$ 363.9	$ 2,527.3	$ (440.2)	$ (691.1)	$ 1,832.3	$ 2.8	$ 1,835.1

See Notes to Consolidated Financial Statements

Note 1 – Nature of Operations and Significant Accounting Policies

Nature of Operations

We are a diversified manufacturer of highly engineered industrial products comprised of four reporting segments: Process Flow Technologies, Payment & Merchandising Technologies, Aerospace & Electronics and Engineered Materials. Our primary end markets include process industries (chemical production, oil & gas, power, and general industrial), non-residential and municipal construction, payment automation solutions, banknote design and production, aerospace, defense and space, along with a wide range of general industrial and certain consumer related end markets. See Note 4, "Segment Information" for the relative size of these segments in relation to the total company (both net sales and total assets).

Discontinued Operations. On May 16, 2021, we entered into an agreement to sell the Engineered Materials segment to Grupo Verzatec S.A. de C.V. for $360 million on a cash-free and debt-free basis. The sale is subject to customary closing conditions and regulatory approvals. We determined that the Engineered Materials segment met the criteria of being reported as a discontinued operation as of June 30, 2021. As a result, the related assets, liabilities and operating results of Engineered Materials are presented as discontinued operations and, as such, have been excluded from both continuing operations and segment results for all periods presented. Throughout this Annual Report on Form 10-K, unless otherwise indicated, amounts and activity are presented on a continuing operations basis. See Item 8 under Note 3, "Discontinued Operations," in the Notes to Consolidated Financial Statements for additional details.

Process Flow Technologies. In the second quarter of 2021, we changed the name of our 'Fluid Handling' segment to 'Process Flow Technologies'. This new name better conveys the key strengths and core competencies of the segment; providing proprietary and highly engineered process flow technology solutions to its customers.

Due to rounding, numbers presented throughout this report may not add up precisely to totals we provide, and percentages may not precisely reflect the absolute figures.

Significant Accounting Policies

Accounting Principles. Our consolidated financial statements are prepared in conformity with accounting principles generally accepted in the United States of America ("U.S. GAAP"). The consolidated financial statements include the accounts of Crane Co. and our subsidiaries. All intercompany balances and transactions have been eliminated upon consolidation. As used in these notes, the terms "we," "us," "our," "Crane" and the "Company" mean Crane Co. and our subsidiaries unless the context specifically states or implies otherwise.

Basis of presentation. Certain amounts in the prior years' consolidated financial statements have been reclassified to conform to the current year presentation.

Use of Estimates. Our accounting principles require management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements and the reported amounts of revenue and expense during the reporting period. Actual results may differ from those estimated. Estimates and assumptions are reviewed periodically, and the effects of revisions are reflected in the financial statements in the period in which they are determined to be necessary. Estimates are used when accounting for such items as asset valuations, allowance for doubtful accounts, depreciation and amortization, impairment assessments, reserve for excess and obsolete inventory, reserve for warranty provision, restructuring provisions, employee benefits, taxes, asbestos liability and related insurance receivable, environmental liability and contingencies.

Currency Translation. Assets and liabilities of subsidiaries that prepare financial statements in currencies other than the U.S. dollar are translated at the rate of exchange in effect on the balance sheet date; results of operations are translated at the monthly average rates of exchange prevailing during the year. The related translation adjustments are included in accumulated other comprehensive income (loss) in a separate component of equity.

Revenue Recognition. In accordance with Accounting Standards Codification ("ASC") Topic 606 "Revenue from Contracts with Customers," we recognize revenue when control of the promised goods or services in a contract transfers to the customer, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods or services. We account for a contract when both parties have approved and committed to the terms, each party's rights and payment obligations under the contract are identifiable, the contract has commercial substance, and it is probable that we will collect substantially all of the consideration. When shipping and handling activities are performed after the customer obtains control of product, we elect to account for shipping and handling as activities to fulfill the promise to transfer the product. In determining the transaction price of a contract, we exercise judgment to determine the total transaction price when it includes estimates of variable consideration, such as rebates and milestone payments. We generally estimate variable consideration using the expected value method and consider all available information (historical, current, and forecasted) in estimating these amounts. Variable consideration is only included in the transaction price to the extent that it is probable that a significant reversal of cumulative revenue recognized will not occur when the uncertainty associated with the variable consideration is resolved. We elect to exclude from the transaction price all taxes assessed by a governmental authority that are both imposed on and concurrent with a specific revenue-producing transaction and collected by us from a customer.

We primarily generate revenue through the manufacture and sale of engineered industrial products. Each product within a contract generally represents a separate performance obligation, as we do not provide a significant service of integrating or installing the products, the products do not customize each other, and the products can function independently of each other. Control of products generally transfers to the customer at a point in time, as the customer does not control the products as they are manufactured. We exercise judgment and consider the timing of right to payment, transfer of risk and rewards, transfer of title, transfer of physical possession, and customer acceptance when determining when control transfers to the customer. As a result, revenue from the sale of products is generally recognized at a point in time - either upon shipment or delivery - based on the specific shipping terms in the contract. When products are customized or products are sold directly to the U.S. government or indirectly to the U.S. government through subcontracts, revenue is recognized over time because control is transferred continuously to customers, as the contract progresses. We exercise judgment to determine whether the products have an alternative use to us. When an alternative use does not exist for these products and we are entitled to payment for performance completed to date which includes a reasonable profit margin, revenue is recognized over time. When a contract with the U.S. government or subcontract for the U.S. government contains clauses indicating that the U.S. government owns any work-in-progress as the contracted product is being built, revenue is recognized over time. The measure of progress applied by us is the cost-to-cost method as this provides the most faithful depiction of the pattern of transfer of control. Under this method, we measure progress by comparing costs incurred to date to the total estimated costs to provide the performance obligation. This method effectively reflects our progress toward completion, as this methodology includes any work-in-process amounts as part of the measure of progress. Costs incurred represent work performed, which corresponds with, and thereby depicts, the transfer of control to the customer. Total revenue recognized and cost estimates are updated on a monthly basis.

When there are multiple performance obligations in a single contract, the total transaction price is allocated to each performance obligation based on their relative standalone selling prices. We maximize the use of observable data inputs and consider all information (including market conditions, segment-specific factors, and information about the customer or class of customer) that is reasonably available. The standalone selling price for our products and services is generally determined using an observable list price, which differs by class of customer.

Revenue recognized from performance obligations satisfied in previous periods (for example, due to changes in the transaction price or estimates), was not material in any period.

Payment for products is due within a limited time period after shipment or delivery, and we do not offer extended payment terms. Payment is typically due within 30-90 calendar days of the respective invoice dates. Customers generally do not make large upfront payments. Any advanced payments received do not provide us with a significant benefit of financing, as the payments are meant to secure materials used to fulfill the contract, as opposed to providing us with a significant financing benefit.

When an unconditional right to consideration exists, we record these amounts as receivables. When amounts are dependent on factors other than the passage of time in order for payment from a customer to become due, we record a contract asset. Contract assets represent unbilled amounts that typically arise from contracts for customized products or contracts for products sold directly to the U.S. government or indirectly to the U.S. government through subcontracts, where revenue recognized using the cost-to-cost method exceeds the amount billed to the customer. Contract assets are assessed for impairment and recorded at their net realizable value. Contract liabilities represent advance payments from customers. Revenue related to contract liabilities is recognized when control is transferred to the customer.

We pay sales commissions related to certain contracts, which qualify as incremental costs of obtaining a contract. However, the sales commissions generally relate to contracts for products or services satisfied at a point in time or over a period of time less than one year. As a result, we apply the practical expedient that allows an entity to recognize incremental costs of obtaining a contract as an expense when incurred if the amortization period of the asset that would have been recognized is one year or less.

See Note 5, “Revenue” for further details.

Cost of Goods Sold. Cost of goods sold includes the costs of inventory sold and the related purchase and distribution costs. In addition to material, labor and direct overhead and inventoried cost, cost of goods sold include allocations of other expenses that are part of the production process, such as inbound freight charges, purchasing and receiving costs, inspection costs, warehousing costs, amortization of production related intangible assets and depreciation expense. We also include costs directly associated with products sold, such as warranty provisions.

Selling, General and Administrative Expenses. Selling, general and administrative expenses are charged to income as incurred. Such expenses include the costs of promoting and selling products and include such items as compensation, advertising, sales commissions and travel. Also included are costs related to compensation for other operating activities such as executive office administrative and engineering functions, as well as general operating expenses such as office supplies, non-income taxes, insurance and office equipment rentals.

Income Taxes. We account for income taxes in accordance with ASC Topic 740 “Income Taxes” (“ASC 740”) which requires an asset and liability approach for the financial accounting and reporting of income taxes. Under this method, deferred income taxes are recognized for the expected future tax consequences of differences between the tax bases of assets and liabilities and their reported amounts in the financial statements. These balances are measured using the enacted tax rates expected to apply in the year(s) in which these temporary differences are expected to reverse. The effect of a change in tax rates on deferred income taxes is recognized in income in the period when the change is enacted.

Based on consideration of all available evidence regarding their utilization, we record net deferred tax assets to the extent that it is more likely than not that they will be realized. Where, based on the weight of all available evidence, it is more likely than not that some amount of a deferred tax asset will not be realized, we establish a valuation allowance for the amount that, in management's judgment, is sufficient to reduce the deferred tax asset to an amount that is more likely than not to be realized. The evidence we consider in reaching such conclusions includes, but is not limited to, (1) future reversals of existing taxable temporary differences, (2) future taxable income exclusive of reversing taxable temporary differences, (3) taxable income in prior carryback year(s) if carryback is permitted under the tax law, (4) cumulative losses in recent years, (5) a history of tax losses or credit carryforwards expiring unused, (6) a carryback or carryforward period that is so brief it limits realization of tax benefits, and (7) a strong earnings history exclusive of the loss that created the carryforward and support showing that the loss is an aberration rather than a continuing condition.

We account for unrecognized tax benefits in accordance with ASC 740, which prescribes a minimum probability threshold that a tax position must meet before a financial statement benefit is recognized. The minimum threshold is defined as a tax position that is more likely than not to be sustained upon examination by the applicable taxing authority, including resolution of any related appeals or litigation, based solely on the technical merits of the position. The tax benefit recognized is the largest amount of benefit that is greater than 50% likely of being realized upon ultimate settlement.

We recognize interest and penalties related to unrecognized tax benefits within the income tax expense line of our Consolidated Statement of Operations, while accrued interest and penalties are included within the related tax liability line of our Consolidated Balance Sheets.

Earnings Per Share. Our basic earnings per share calculations are based on the weighted average number of common shares outstanding during the year. Potentially dilutive securities include outstanding stock options, restricted share units, deferred stock units and performance-based restricted share units. The dilutive effect of potentially dilutive securities is reflected in diluted earnings per common share by application of the treasury method. Diluted earnings per share gives effect to all potential dilutive common shares outstanding during the year.

(in millions, except per share data) For the year ended December 31,	2021	2020	2019
Net income from continuing operations attributable to common shareholders	$ 394.3	$ 163.1	$ 112.3
Income from discontinued operations, net of tax (Note 3)	41.1	17.9	21.0
Net income attributable to common shareholders	$ 435.4	$ 181.0	$ 133.3
Average basic shares outstanding	58.4	58.3	59.8
Effect of dilutive share-based awards	0.8	0.5	0.8
Average diluted shares outstanding	59.2	58.8	60.6
Earnings per basic share:			
Earnings per basic share from continuing operations	$ 6.76	$ 2.79	$ 1.88
Earnings per basic share from discontinued operations	0.70	0.31	0.35
Earnings per basic share	$ 7.46	$ 3.10	$ 2.23
Earnings per diluted share:			
Earnings per diluted share from continuing operations	$ 6.66	$ 2.77	$ 1.85
Earnings per diluted share from discontinued operations	0.70	0.31	0.35
Earnings per diluted share	$ 7.36	$ 3.08	$ 2.20

The computation of diluted earnings per share excludes the effect of the potential exercise of stock options when the average market price of the common stock is lower than the exercise price of the related stock options. During 2021, 2020 and 2019, the number of stock options excluded from the computation was 1.2 million, 2.1 million and 1.2 million, respectively.

Cash and Cash Equivalents. Cash and cash equivalents include highly liquid investments with original maturities of three months or less that are readily convertible to cash and are not subject to significant risk from fluctuations in interest rates. As a result, the carrying amount of cash and cash equivalents approximates fair value.

Accounts Receivable, Net. Accounts receivable are carried at net realizable value. The allowance for doubtful accounts was $10.4 million and $10.9 million as of December 31, 2021 and 2020, respectively. The allowance for doubtful accounts activity was not material to our financial results for the years ended December 31, 2021 and 2020. Concentrations of credit risk with respect to accounts receivable are limited due to the large number of customers and relatively small account balances within the majority of our customer base and their dispersion across different businesses. We periodically evaluate the financial strength of our customers and believe that our credit risk exposure is limited.

Inventories, net. Inventories consist of the following:

(in millions) December 31,	2021	2020
Finished goods	$ 143.8	$ 125.4
Finished parts and subassemblies	59.5	54.5
Work in process	36.9	45.1
Raw materials	200.7	204.7
Total inventories, net	$ 440.9	$ 429.7

Inventories, net include the costs of material, labor and overhead and are stated at the lower of cost or net realizable value. Domestic inventories are stated at either the lower of cost or net realizable value using the last-in, first-out ("LIFO") method or the lower of cost or net realizable value using the first-in, first-out ("FIFO") method. Inventories held in foreign locations are primarily stated at the lower of cost or market using the FIFO method. The LIFO method is not being used at our foreign locations as such a method is not allowable for tax purposes. Changes in the levels of LIFO inventories have increased (reduced) cost of sales by $2.1 million, $2.3 million and $(1.9) million for the years ended December 31, 2021, 2020 and 2019, respectively. The portion of inventories costed using the LIFO method was 28.5% and 29.3% of consolidated inventories as of December 31, 2021 and 2020, respectively. If inventories that were valued using the LIFO method had been valued under the FIFO method, they would have been higher by $28.2 million and $26.2 million as of December 31, 2021 and 2020, respectively. The reserve for excess and obsolete inventory was $98.5 million and $95.7 million as of December 31, 2021 and 2020, respectively.

Valuation of Long-Lived Assets. We review our long-lived assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Examples of events or changes in circumstances could include, but are not limited to, a prolonged economic downturn, current period operating or cash flow losses combined with a history of losses or a forecast of continuing losses associated with the use of an asset or asset group, or a current expectation that an asset or asset group will be sold or disposed of before the end of its previously estimated useful life. Recoverability is based upon projections of anticipated future undiscounted cash flows associated with the use and eventual disposal of the long-lived asset (or asset group), as well as specific appraisal in certain instances. Reviews occur at the lowest level for which identifiable cash flows are largely independent of cash flows associated with other long-lived assets or asset groups. If the future undiscounted cash flows are less than the carrying value, then the long-lived asset is considered impaired and a loss is recognized based on the amount by which the carrying amount exceeds the estimated fair value. Judgments which impact these assessments relate to the expected useful lives of long-lived assets and our ability to realize any undiscounted cash flows in excess of the carrying amounts of such assets, and are affected primarily by changes in the expected use of the assets, changes in technology or development of alternative assets, changes in economic conditions, changes in operating performance and changes in expected future cash flows. Since judgment is involved in determining the recoverable amount of long-lived assets, there is risk that the carrying value of our long-lived assets may require adjustment in future periods.

Property, Plant and Equipment, net. Property, plant and equipment, net consists of the following:

(in millions) December 31,	2021	2020
Land	$ 77.5	$ 85.6
Buildings and improvements	252.3	263.0
Machinery and equipment	850.1	843.3
Gross property, plant and equipment	1,179.9	1,191.9
Less: accumulated depreciation	652.6	618.2
Property, plant and equipment, net	$ 527.3	$ 573.7

Property, plant and equipment is stated at cost and depreciation is calculated by the straight-line method over the estimated useful lives of the respective assets, which range from 10 to 25 years for buildings and improvements and three to 10 years for machinery and equipment. Depreciation expense was $73.6 million, $73.7 million and $68.1 million for the years ended December 31, 2021, 2020 and 2019, respectively.

Goodwill and Other Intangible Assets. Our business acquisitions have typically resulted in the recognition of goodwill and other intangible assets. We follow the provisions under ASC Topic 350, “Intangibles – Goodwill and Other” (“ASC 350”) as it relates to the accounting for goodwill in the Consolidated Financial Statements. These provisions require that we, on at least an annual basis, evaluate the fair value of the reporting units to which goodwill is assigned and attributed and compare that fair value to the carrying value of the reporting unit to determine if an impairment has occurred. We perform our annual impairment testing during the fourth quarter. Impairment testing takes place more often than annually if events or circumstances indicate a change in status that would indicate a potential impairment. We believe that there have been no other events or circumstances which would more likely than not reduce the fair value of our reporting units below its carrying value. A reporting unit is an operating segment unless discrete financial information is prepared and reviewed by segment management for businesses one level below that operating segment (a “component”), in which case the component would be the reporting unit. As of December 31, 2021, we had seven reporting units. In the second quarter of 2021, the assets and liabilities of our Engineered Materials segment (which is a separate reportable segment and reporting unit) were classified as held for sale. See Note 3, “Discontinued Operations” for additional details.

When performing our annual impairment assessment, we compare the fair value of each of our reporting units to our respective carrying value. Goodwill is considered to be potentially impaired when the net book value of the reporting unit exceeds its estimated fair value. Fair values are established primarily by discounting estimated future cash flows at an estimated cost of capital which varies for each reporting unit and which, as of our most recent annual impairment assessment, ranged between 9.5% and 11.5% (a weighted average of 10.7%), reflecting the respective inherent business risk of each of the reporting units tested. This methodology for valuing our reporting units (commonly referred to as the Income Method) has not changed since the adoption of the provisions under ASC 350. The determination of discounted cash flows is based on the businesses’ strategic plans and long-range planning forecasts, which change from year to year. The revenue growth rates included in the forecasts represent best estimates based on current and forecasted market conditions. Profit margin assumptions are projected by each reporting unit based on the current cost structure and anticipated net cost increases/reductions. There are inherent uncertainties related to these assumptions, including changes in market conditions, and management judgment is necessary in applying them to the analysis of goodwill impairment. In addition to the foregoing, for each reporting unit, market multiples are used to corroborate discounted cash flow results where fair value is estimated based on earnings multiples determined by available public information of comparable businesses. While we believe we have made reasonable estimates and assumptions to calculate the fair value of our reporting units, it is possible a material change could occur. If actual results are not consistent with management's estimates and assumptions, goodwill and other intangible assets may then be determined to be overstated and a charge would need to be taken against net earnings. No impairment charges have been required during 2021, 2020 or 2019.

Changes to goodwill are as follows:

(in millions)	Aerospace & Electronics	Process Flow Technologies	Payment & Merchandising Technologies	Total
Balance as of December 31, 2019	$ 202.4	$ 240.9	$ 857.8	$ 1,301.1
Additions	—	106.1	—	106.1
Adjustments to purchase price allocations	—	—	5.6	5.6
Currency translation	0.1	13.0	11.8	24.9
Balance as of December 31, 2020	$ 202.5	$ 360.0	$ 875.2	$ 1,437.7
Adjustments to purchase price allocations	—	(0.1)	—	(0.1)
Currency translation	—	(10.5)	(14.6)	(25.1)
Balance as of December 31, 2021	$ 202.5	$ 349.4	$ 860.6	$ 1,412.5

For the year ended December 31, 2020, additions to goodwill within the Process Flow Technologies segment were $106.1 million. These additions represent the preliminary purchase price allocation for the acquisition of CIRCOR International, Inc.'s Instrumentation & Sampling Business ("I&S"). For the year ended December 31, 2020, adjustments to goodwill within the Payment & Merchandising Technologies segment were $5.6 million. These adjustments represent the finalization of the purchase price allocation for the acquisition of Cummins-Allison Corp. ("Cummins-Allison"). For the year ended December 31, 2021, adjustments within the Process Flow Technologies segment of $0.1 million represent the finalization of the purchase price allocation for the acquisition of I&S. See a discussion in Note 2, "Acquisitions" for further details.

Intangibles with indefinite useful lives are tested annually for impairment, or when events or changes in circumstances indicate the potential for impairment. If the carrying amount of an indefinite lived intangible asset exceeds its fair value, the intangible asset is written down to its fair value. Fair value is calculated using relief from royalty method. We amortize the cost of definite-lived intangibles over their estimated useful lives.

In addition to annual testing for impairment of indefinite-lived intangible assets, we review all of our definite-lived intangible assets for impairment whenever events or changes in circumstances indicate the carrying amount of an asset may not be recoverable. Examples of events or changes in circumstances could include, but are not limited to, a prolonged economic downturn, current period operating or cash flow losses combined with a history of losses or a forecast of continuing losses associated with the use of an asset or asset group, or a current expectation that an asset or asset group will be sold or disposed of before the end of its previously estimated useful life. Recoverability is based upon projections of anticipated future undiscounted cash flows associated with the use and eventual disposal of the definite-lived intangible asset (or asset group), as well as specific appraisal in certain instances. Reviews occur at the lowest level for which identifiable cash flows are largely independent of cash flows associated with other long-lived assets or asset groups and include estimated future revenues, gross profit margins, operating profit margins and capital expenditures which are based on the businesses' strategic plans and long-range planning forecasts, which change from year to year. The revenue growth rates included in the forecasts represent our best estimates based on current and forecasted market conditions, and the profit margin assumptions are based on the current cost structure and anticipated net cost increases or reductions. There are inherent uncertainties related to these assumptions, including changes in market conditions, and management's judgment in applying them to the analysis. If the future undiscounted cash flows are less than the carrying value, then the definite-lived intangible asset is considered impaired and a charge would be taken against net earnings based on the amount by which the carrying amount exceeds the estimated fair value. Judgments that we make which impact these assessments relate to the expected useful lives of definite-lived assets and its ability to realize any undiscounted cash flows in excess of the carrying amounts of such assets, and are affected primarily by changes in the expected use of the assets, changes in technology or development of alternative assets, changes in economic conditions, changes in operating performance and changes in expected future cash flows. Since judgment is involved in determining the recoverable amount of definite-lived intangible assets, there is risk that the carrying value of our definite-lived intangible assets may require adjustment in future periods. Historical results to date have generally approximated expected cash flows for the identifiable cash flow generating level.

As of December 31, 2021, we had $465.9 million of net intangible assets, of which $70.6 million were intangibles with indefinite useful lives, consisting of trade names. As of December 31, 2020, we had $519.1 million of net intangible assets, of which $70.9 million were intangibles with indefinite useful lives, consisting of trade names.

Changes to intangible assets are as follows:

(in millions) December 31,	2021	2020	2019
Balance at beginning of period, net of accumulated amortization	$ 519.1	$ 503.7	$ 478.3
Additions	—	52.5	66.0
Amortization expense	(44.5)	(48.3)	(37.8)
Currency translation and other	(8.7)	11.2	(2.8)
Balance at end of period, net of accumulated amortization	$ 465.9	$ 519.1	$ 503.7

For the year ended December 31, 2020, additions to intangible assets represent the preliminary purchase price allocation related to the January 2020 acquisition of I&S. See discussion in Note 2, "Acquisitions" for further details.

A summary of intangible assets follows:

(in millions)	Weighted Average Amortization Period of Finite Lived Assets (in years)	December 31, 2021 Gross Asset	December 31, 2021 Accumulated Amortization	December 31, 2021 Net	December 31, 2020 Gross Asset	December 31, 2020 Accumulated Amortization	December 31, 2020 Net
Intellectual property rights	15.2	$ 131.9	$ 54.3	$ 77.6	$ 133.2	$ 53.4	$ 79.8
Customer relationships and backlog	18.3	611.8	270.1	341.8	623.7	241.9	381.8
Drawings	40.0	11.1	10.6	0.5	11.1	10.5	0.6
Other	11.8	137.4	91.3	46.0	140.2	83.3	56.9
Total	17.8	$ 892.2	$ 426.3	$ 465.9	$ 908.2	$ 389.1	$ 519.1

Future amortization expense associated with intangibles is expected to be:

Year	(in millions)
2022	$ 42.9
2023	$ 42.4
2024	$ 41.5
2025	$ 36.0
2026 and after	$ 232.5

Accumulated Other Comprehensive Loss

The tables below provide the accumulated balances for each classification of accumulated other comprehensive loss, as reflected on the Consolidated Balance Sheets.

(in millions)	Defined Benefit Pension and Other Postretirement Items	Currency Translation Adjustment	Total [(a)]
Balance as of December 31, 2018	$ (296.6)	$ (151.0)	$ (447.6)
Other comprehensive (loss) income before reclassifications	(58.4)	11.6	(46.8)
Amounts reclassified from accumulated other comprehensive loss	10.7	—	10.7
Net period other comprehensive (loss) income	(47.7)	11.6	(36.1)
Balance as of December 31, 2019	(344.3)	(139.4)	(483.7)
Other comprehensive (loss) income before reclassifications	(67.4)	70.9	3.5
Amounts reclassified from accumulated other comprehensive loss	13.8	—	13.8
Net period other comprehensive (loss) income	(53.6)	70.9	17.3
Balance as of December 31, 2020	(397.9)	(68.5)	(466.4)
Other comprehensive income (loss) before reclassifications	78.0	(69.8)	8.2
Amounts reclassified from accumulated other comprehensive loss	18.0	—	18.0
Net period other comprehensive income (loss)	96.0	(69.8)	26.2
Balance as of December 31, 2021	$ (301.9)	$ (138.3)	$ (440.2)

(a) Net of tax benefit of $117.9 million, $148.2 million and $135.4 million for 2021, 2020, and 2019, respectively.

The table below illustrates the amounts reclassified out of each component of accumulated other comprehensive loss for the years ended December 31, 2021, 2020 and 2019. Amortization of pension and postretirement components have been recorded within “Miscellaneous income, net” on the Consolidated Statements of Operations.

(in millions)	Amount Reclassified from Accumulated Other Comprehensive Loss		
December 31,	2021	2020	2019
Amortization of pension items:			
Prior service costs	$ (0.1)	$ (0.3)	$ (0.3)
Net loss	23.4	19.1	15.3
Amortization of postretirement items:			
Prior service costs	(1.1)	(1.1)	(1.1)
Net gain	—	—	(0.3)
Total before tax	$ 22.2	$ 17.7	$ 13.6
Tax impact	4.2	3.9	2.9
Total reclassifications for the period	$ 18.0	$ 13.8	$ 10.7

Recent Accounting Pronouncements - Adopted

Simplifying the Accounting for Income Taxes

In December 2019, the Financial Accounting Standards Board ("FASB") issued amended guidance to simplify the accounting for income taxes. The guidance is effective for fiscal years beginning after December 15, 2020, including interim periods within those fiscal years. Certain amendments are to be applied prospectively, while other amendments are to be applied retrospectively to all periods presented. We have adopted this standard effective January 1, 2021. The adoption of this new standard did not impact our consolidated financial statements.

Disclosure Requirements for Defined Benefit Plans

In August 2018, the FASB issued amended guidance to add, remove, and clarify disclosure requirements related to defined benefit pension and other postretirement plans. The amended guidance removes the requirements to disclose: amounts in accumulated other comprehensive income (loss) expected to be recognized as components of net periodic benefit cost over the next fiscal year; the amount and timing of plan assets expected to be returned to the entity; and the effects of a one-percentage point change in assumed health care cost trend rates. The amended guidance requires disclosure of an explanation of the reasons for significant gains and losses related to changes in the benefit obligation for the period. This guidance is effective for fiscal years ending after December 15, 2020. Effective December 31, 2020, we adopted the amended guidance and applied the disclosure requirements on a retrospective basis to all periods presented. This amended guidance did not have a material effect on our disclosures.

Measurement of Credit Losses on Financial Instruments

In June 2016, the FASB issued amended guidance that changes the impairment model for most financial assets and certain other instruments. For trade receivables, contract assets and other receivables, held-to-maturity debt securities, loans and other instruments, entities are required to use a current expected credit loss ("CECL") model that will immediately recognize an estimate of credit losses that are expected to occur over the life of the financial instruments that are in the scope of this update, including trade receivables. For available-for-sale debt securities with unrealized losses, entities will measure credit losses in a manner similar to current practice, except that the losses will be recognized as an allowance. The CECL model is based on relevant information about past events, including historical experience, current conditions and reasonable and supportable forecasts that affect collectability.

On January 1, 2020, we adopted the new CECL standard and developed an expected impairment model based on our historical loss experience. We believe that our previous methodology to calculate credit losses is generally consistent with the new expected credit loss model and did not result in a material adjustment upon adoption. The allowance for doubtful accounts was $10.4 million and $10.9 million as of December 31, 2021 and 2020, respectively.

Note 2 – Acquisitions

Acquisitions are accounted for in accordance with ASC Topic 805, "Business Combinations" ("ASC 805"). Accordingly, we make an initial allocation of the purchase price at the date of acquisition based upon our understanding of the fair value of the acquired assets and assumed liabilities. We obtain this information during due diligence and through other sources. In the months after closing, as we obtain additional information about these assets and liabilities, including through tangible and intangible asset appraisals, we are able to refine estimates of fair value and more accurately allocate the purchase price. Only items identified as of the acquisition date are considered for subsequent adjustment to the purchase price allocation. We will make appropriate adjustments to the purchase price allocation prior to completion of the measurement period, as required.

In order to allocate the consideration transferred for our acquisitions, the fair values of all identifiable assets and liabilities must be established. For accounting and financial reporting purposes, fair value is defined under ASC Topic 820, "Fair Value Measurement and Disclosure" as the price that would be received upon sale of an asset or the amount paid to transfer a liability in an orderly transaction between market participants at the measurement date. Market participants are assumed to be buyers and sellers in the principal (most advantageous) market for the asset or liability. Additionally, fair value measurements for an asset assume the highest and best use of that asset by market participants. Use of different estimates and judgments could yield different results.

Instrumentation & Sampling Business Acquisition

On January 31, 2020, we completed the acquisition of I&S for $172.3 million on a cash-free and debt-free basis, subject to a later adjustment reflecting I&S' net working capital, cash, the assumption of certain debt-like items, and I&S' transaction expenses. We funded the acquisition through short-term borrowings consisting of $100 million of commercial paper and $67 million from our revolving credit facility, and cash on hand. In August 2020, we received $3.1 million related to the final working capital adjustment which resulted in net cash paid of $169.2 million.

I&S designs, engineers and manufactures a broad range of critical fluid control instrumentation and sampling solutions used in severe service environments which complements our existing portfolio of chemical, refining, petrochemical and upstream oil and gas applications. I&S has been integrated into the Process Flow Technologies segment. The amount allocated to goodwill reflects the expected sales synergies, manufacturing efficiency and procurement savings. Goodwill from this acquisition is not deductible for tax purposes.

Allocation of Consideration Transferred to Net Assets Acquired

The following amounts represent the determination of the fair value of identifiable assets acquired and liabilities assumed from our acquisition of I&S. The fair value of certain assets and liabilities has been completed as required by ASC 805.

Net assets acquired *(in millions)*	
Total current assets	$ 21.0
Property, plant and equipment	11.0
Other assets	6.0
Intangible assets	52.5
Goodwill	106.0
Total assets acquired	$ 196.5
Total current liabilities	$ 8.1
Other liabilities	19.2
Total assumed liabilities	$ 27.3
Net assets acquired	$ 169.2

The amounts allocated to acquired intangible assets, and their associated weighted-average useful lives which were determined based on the period in which the assets are expected to contribute directly or indirectly to our future cash flows, consist of the following:

Intangible Assets *(dollars in millions)*	Intangible Fair Value	Weighted Average Life
Trademarks/trade names	$ 2.6	13
Customer relationships	49.0	14
Backlog	0.9	1
Total acquired intangible assets	$ 52.5	

The fair values of the trademark and trade name intangible assets were determined by using an income approach, specifically the relief-from-royalty approach, which is a commonly accepted valuation approach. This approach is based on the assumption that in lieu of ownership, a firm would be willing to pay a royalty in order to exploit the related benefits of this asset. Therefore, a portion of I&S' earnings, equal to the after-tax royalty that would have been paid for the use of the asset, can be attributed to our ownership. The trade names are being amortized on a straight-line basis (which approximates the economic pattern of benefits) over the estimated economic life of 13 years.

The fair values of the customer relationships and backlog intangible assets were determined by using an income approach which is a commonly accepted valuation approach. Under this approach, the net earnings attributable to the asset or liability being measured are isolated using the discounted projected net cash flows. These projected cash flows are isolated from the projected cash flows of the combined asset group over the remaining economic life of the intangible asset or liability being measured. Both the amount and the duration of the cash flows are considered from a market participant perspective. Our estimates of market participant net cash flows considered historical and projected pricing, operational performance including market participant synergies, aftermarket retention, product life cycles, material and labor pricing, and other relevant customer, contractual and market factors. Where appropriate, the net cash flows were adjusted to reflect the potential attrition of existing customers in the future, as existing customers are expected to decline over time. The attrition-adjusted future cash flows are then discounted to present value using an appropriate discount rate. The customer relationship asset is being amortized on a straight-line basis (which approximates the economic pattern of benefits) over the estimated economic life of 14 years.

Supplemental Pro Forma Data

I&S' results of operations have been included in our financial statements for the period subsequent to the completion of the acquisition on January 31, 2020. Consolidated pro forma revenue and net income attributable to common shareholders has not been presented since the impact is not material to our financial results for either prior period.

Cummins-Allison Acquisition

On December 31, 2019 we completed the acquisition of Cummins-Allison. The base purchase price of the acquisition was $160 million on a cash-free, debt-free basis, subject to a later adjustment reflecting Cummins-Allison's net working capital, cash, and Cummins-Allison's transaction expenses. The amount paid, net of cash acquired, was $156.2 million. We issued $150 million of commercial paper and used cash on hand to fund the acquisition. In November 2020, we paid $0.2 million related to the final working capital adjustment which resulted in net cash paid of $156.4 million.

Cummins-Allison is a leading provider of high speed, cash and coin counting and sorting machines and retail cash office solutions which are primarily used in back-office applications. Cummins-Allison has been integrated into our Payment & Merchandising Technologies segment. Cummins-Allison also has a nationwide service network to support these hardware sales. The amount allocated to goodwill reflects the expected synergies related to material costs, supply chain manufacturing productivity and research and development. Goodwill from this acquisition is not deductible for tax purposes.

Allocation of Consideration Transferred to Net Assets Acquired

The following amounts represent the determination of the fair value of identifiable assets acquired and liabilities assumed from our acquisition of Cummins-Allison. The fair value of certain assets and liabilities has been completed as required by ASC 805.

Net assets acquired *(in millions)*	
Total current assets	$ 91.6
Property, plant and equipment	26.3
Other assets	9.1
Intangible assets	66.0
Goodwill	60.3
Total assets acquired	$ 253.3
Total current liabilities	$ 71.6
Other liabilities	25.3
Total assumed liabilities	$ 96.9
Net assets acquired	$ 156.4

The amounts allocated to acquired intangible assets, and their associated weighted-average useful lives which were determined based on the period in which the assets are expected to contribute directly or indirectly to our future cash flows, consist of the following:

Intangible Assets *(dollars in millions)*	Intangible Fair Value	Weighted Average Life
Trademarks/trade names	$ 3.0	7
Customer relationships	54.5	18
Product technology	8.5	10
Total acquired intangible assets	$ 66.0	

The fair values of the trademark and trade name intangible assets were determined by using an "income approach," specifically the relief-from-royalty approach, which is a commonly accepted valuation approach. This approach is based on the assumption that in lieu of ownership, a firm would be willing to pay a royalty in order to exploit the related benefits of this asset. Therefore, a portion of Cummins-Allison's earnings, equal to the after-tax royalty that would have been paid for the use of the asset, can be attributed to the firm's ownership. The trade name Cummins Allison is being amortized on a straight-line basis (which approximates the economic pattern of benefits) over the estimated economic life of seven years.

The fair values of the customer relationships intangible assets were determined by using an "income approach" which is a commonly accepted valuation approach. Under this approach, the net earnings attributable to the asset or liability being measured are isolated using the discounted projected net cash flows. These projected cash flows are isolated from the projected cash flows of the combined asset group over the remaining economic life of the intangible asset or liability being measured. Both the amount and the duration of the cash flows are considered from a market participant perspective. Our estimates of market participant net cash flows considered historical and projected pricing, operational performance including market participant synergies, aftermarket retention, product life cycles, material and labor pricing, and other relevant customer, contractual and market factors. Where appropriate, the net cash flows were adjusted to reflect the potential attrition of existing customers in the future, as existing customers are a "wasting" asset and are expected to decline over time. The attrition-adjusted future cash flows are then discounted to present value using an appropriate discount rate. The customer relationship is being amortized on a straight-line basis (which approximates the economic pattern of benefits) over the estimated economic life of 18 years.

The fair values of the product technology intangible assets were also determined by the relief-from-royalty approach. Similarly, this approach is based on the assumption that in lieu of ownership, a firm would be willing to pay a royalty in order to exploit the related benefits of the technology. Therefore, a portion of Cummins-Allison's earnings, equal to the after-tax royalty that would have been paid for the use of the technology, can be attributed to the firm's ownership of the technology. The technology assets are being amortized on a straight-line basis (which approximates the economic pattern of benefits) over the estimated economic life of 10 years.

Supplemental Pro Forma Data

The following unaudited pro forma combined information assumes that the acquisition was completed on January 1, 2019. The unaudited pro forma consolidated net sales for 2019 would have been $3,266.6 million. The unaudited pro forma consolidated net sales are provided for illustrative purposes only and are not indicative of our actual consolidated results of operations or consolidated financial position. Consolidated pro forma net income attributable to common shareholders has not been presented since the impact is not material to our financial results in any of the periods.

Acquisition-Related Costs

Acquisition-related costs are being expensed as incurred. For the years ended December 31, 2020 and 2019, we recorded $12.9 million and $5.2 million, respectively, of integration and transaction costs. Acquisition-related costs are recorded within "Acquisition-related and integration charges" in our Consolidated Statements of Operations.

Note 3 - Discontinued Operations

A business is classified as held for sale when management having the authority to approve the action commits to a plan to sell the business, the sale is probable to occur during the next 12 months at a price that is reasonable in relation to its current fair value and certain other criteria are met. A business classified as held for sale is recorded at the lower of its carrying amount or estimated fair value less cost to sell. When the carrying amount of the business exceeds its estimated fair value less cost to sell, a loss is recognized and updated each reporting period as appropriate.

Executing on our strategy to focus our growth investments on our three remaining segments, on May 16, 2021, we entered into an agreement to sell our Engineered Materials segment to Grupo Verzatec S.A. de C.V. for $360 million on a cash-free and debt-free basis. The sale is subject to customary closing conditions and regulatory approvals. In the second quarter of 2021, the assets and liabilities of the segment were classified as held for sale, and the segment's results are presented as discontinued operations. This change was applied on a retrospective basis.

The following represents financial results from discontinued operations:

	For the year ended December 31,		
(in millions)	**2021**	**2020**	**2019**
Net sales	$ 228.0	$ 175.6	$ 208.6
Cost of sales	181.3	134.5	161.9
Selling, general and administrative	19.8	17.8	19.4
Restructuring charges	—	0.6	—
Operating profit	$ 26.9	$ 22.7	$ 27.3
Miscellaneous expense, net	(1.3)	—	(0.5)
Income from discontinued operations	$ 25.6	$ 22.7	$ 26.8
Income tax (benefit) provision[a]	(15.5)	4.8	5.8
Income from discontinued operations, net of tax	$ 41.1	$ 17.9	$ 21.0

[a] The period ended December 31, 2021 includes $20.6 million of deferred tax benefit associated with the pending disposition of the Engineered Materials segment.

The following represents major classes of assets and liabilities to be disposed of in the transaction:

(in millions)	December 31, 2021	December 31, 2020
Assets:		
Accounts receivable, net	$ 10.6	$ 8.8
Inventories, net	8.2	8.5
Other current assets	0.6	0.1
Current assets held for sale [a]	19.4	17.4
Property, plant and equipment, net	28.3	26.8
Other assets	0.3	0.6
Intangible assets, net	1.2	1.2
Goodwill	171.3	171.3
Long-term assets held for sale [a]	201.1	199.9
Assets held for sale	$ 220.5	$ 217.3
Liabilities:		
Accounts payable	$ 27.0	$ 19.5
Accrued liabilities	12.0	7.9
Current liabilities held for sale [a]	39.0	27.4
Long-term deferred tax liability	5.8	26.1
Other liabilities	0.1	0.1
Long-term liabilities held for sale [a]	5.9	26.2
Liabilities held for sale	$ 44.9	$ 53.6

[a] We reasonably expect to close on this transaction within one year from the date of our entry into the agreement, and therefore have presented the assets and liabilities as current as of December 31, 2021.

Note 4 – Segment Information

In accordance with ASC Topic 280, "Segment Reporting," for purposes of segment performance measurement, we do not allocate to the business segments items that are of a non-operating nature, including charges which occur from time to time related to our asbestos liability and our legacy environmental liabilities, as such items are not related to current business activities; or corporate organizational and functional expenses of a governance nature. "Corporate expenses-before asbestos and environmental charges" consist of corporate office expenses including, compensation, benefits, occupancy, depreciation, and other administrative costs. Assets of the business segments exclude general corporate assets, which principally consist of cash and cash equivalents, deferred tax assets, insurance receivables, certain property, plant and equipment, and certain other assets.

The accounting policies of the segments are the same as those described in the summary of significant accounting policies. We account for intersegment sales and transfers as if the sales or transfers were to third parties at current market prices.

Our segments are reported on the same basis used internally for evaluating performance and for allocating resources. We have four reporting segments: Process Flow Technologies, Payment & Merchandising Technologies, Aerospace & Electronics and Engineered Materials.

A brief description of each of our segments is as follows:

Aerospace & Electronics

The Aerospace & Electronics segment supplies critical components and systems, including original equipment and aftermarket parts, primarily for the commercial aerospace and military aerospace and defense markets. Its brands have decades of proven experience, and in many cases invented the critical technologies in their respective markets. The business designs and delivers proven systems, reliable components, and flexible power solutions that excel in tough and mission-critical environments. Products and services are organized into six integrated solutions: Sensing Components & Systems, Electrical Power Solutions, Fluid Management Solutions, Landing & Control Systems, and Microwave Solutions.

Process Flow Technologies

The Process Flow Technologies segment is a provider of highly engineered Process Flow Technologies equipment for critical performance applications that require high reliability. The segment is comprised of Process Valves and Related Products, Commercial Valves, and Pumps and Systems. Process Valves and Related Products include on/off valves and related products for critical and demanding applications in the chemical, oil & gas, power, and general industrial end markets globally. Commercial Valves includes the manufacturing and distribution of valves and related products for the non-residential construction, general industrial, and to a lesser extent, municipal markets. Pumps and Systems include pumps and related products primarily for water and wastewater applications in the industrial, municipal, commercial and military markets.

Payment & Merchandising Technologies

The Payment & Merchandising Technologies segment consists of Crane Payment Innovations ("CPI") and Crane Currency. CPI provides high technology payment acceptance and dispensing products to original equipment manufacturers, and for certain vertical markets, it also provides currency handling and processing systems, complete cash and cashless payment and merchandising solutions, equipment service solutions, and fully connected managed service solutions. Crane Currency is a supplier of banknotes and highly engineered banknote security features.

Engineered Materials

The Engineered Materials segment manufactures fiberglass-reinforced plastic ("FRP") panels and coils, primarily for use in the manufacturing of recreational vehicles ("RVs"), truck bodies and trailers (Transportation), with additional applications in commercial and industrial buildings (Building Products). In the second quarter of 2021, the assets and liabilities of the Engineered Materials segment were reclassified as held for sale and results are presented as discontinued operations and, therefore, not included in the tables below. This change was applied on a retrospective basis. See Note 3, "Discontinued Operations" for further details.

Financial information by reportable segment is set forth below:

(in millions) December 31,	2021	2020	2019
Net Sales:			
Aerospace & Electronics	$ 638.3	$ 650.7	$ 798.8
Process Flow Technologies	1,196.6	1,005.8	1,117.4
Payment & Merchandising Technologies	1,345.1	1,104.8	1,158.3
TOTAL NET SALES	$ 3,180.0	$ 2,761.3	$ 3,074.5
Operating profit:			
Aerospace & Electronics	$ 110.0	$ 100.7	$ 189.4
Process Flow Technologies	182.5	97.7	131.7
Payment & Merchandising Technologies	307.5	100.6	177.3
Corporate expense — before asbestos and environmental provisions	(97.7)	(58.8)	(67.4)
Corporate expense — asbestos provision, net	—	—	(229.0)
Corporate expense — environmental provision, net	—	—	(18.9)
TOTAL OPERATING PROFIT	$ 502.3	$ 240.2	$ 183.1
Capital expenditures:			
Aerospace & Electronics	$ 14.1	$ 9.8	$ 20.0
Process Flow Technologies	18.8	13.7	23.4
Payment & Merchandising Technologies	18.6	9.3	20.6
Corporate	0.2	0.1	0.4
TOTAL CAPITAL EXPENDITURES	$ 51.7	$ 32.9	$ 64.4
Depreciation and amortization:			
Aerospace & Electronics	$ 14.7	$ 14.2	$ 13.5
Process Flow Technologies	22.0	21.6	14.2
Payment & Merchandising Technologies	81.3	85.9	77.1
Corporate	1.5	2.1	3.1
TOTAL DEPRECIATION AND AMORTIZATION	$ 119.5	$ 123.8	$ 107.9

For the year ended December 31, 2021, operating profit included a restructuring gain of $16.9 million. For the year ended December 31, 2020, operating profit included acquisition-related and integration charges of $12.9 million and net restructuring charges of $31.7 million. For the year ended December 31, 2019, operating profit included a net asbestos provision of $229.0 million, a net environmental provision of $18.9 million, acquisition-related and integration charges of $5.2 million and net restructuring charges of $17.5 million. See Note 2, “Acquisitions” for discussion on the acquisition-related costs. See Note 16, “Restructuring Charges” for discussion of the restructuring charges. See Note 13, “Commitments and Contingencies” for discussion of the asbestos provision and environmental provision.

Net sales by geographic region:

(in millions) December 31,	2021	2020	2019
Net sales [(a)]			
United States	$ 1,645.4	$ 1,423.2	$ 1,557.0
Canada	286.9	217.1	243.1
United Kingdom	140.9	122.8	168.6
Continental Europe	406.0	362.7	465.4
Other international	700.8	635.5	640.4
TOTAL NET SALES	$ 3,180.0	$ 2,761.3	$ 3,074.5

(a) Net sales by geographic region are based on the destination of the sale.

Balance sheet items by reportable segment is set forth below:

(in millions) December 31,	2021	2020
Goodwill:		
Aerospace & Electronics	$ 202.5	$ 202.5
Process Flow Technologies	349.4	360.0
Payment & Merchandising Technologies	860.6	875.2
TOTAL GOODWILL	$ 1,412.5	$ 1,437.7
Assets:		
Aerospace & Electronics	$ 604.7	$ 593.9
Process Flow Technologies	1,240.4	1,106.1
Payment & Merchandising Technologies	2,096.5	2,215.3
Corporate	324.5	482.4
Assets held for sale	220.5	217.3
TOTAL ASSETS	$ 4,486.6	$ 4,615.0

Long-lived assets by geographic region:

(in millions) December 31,	2021	2020
Long-lived assets [(a)]		
United States	$ 295.8	$ 311.9
Canada	18.2	15.8
Europe	231.3	266.6
Other international	62.8	60.7
Corporate	15.6	22.4
TOTAL LONG-LIVED ASSETS	$ 623.7	$ 677.4

(a) Long-lived assets, net by geographic region are based on the location of the business unit.

Note 5 - Revenue

Disaggregation of Revenues

The following table presents net sales disaggregated by product line for each segment:

(in millions) December 31,	2021	2020	2019
Aerospace & Electronics			
Commercial Original Equipment	$ 229.4	$ 226.4	$ 357.2
Military Original Equipment	239.7	258.7	217.2
Commercial Aftermarket Products	104.5	93.0	161.4
Military Aftermarket Products	64.7	72.6	63.0
Total Aerospace & Electronics	$ 638.3	$ 650.7	$ 798.8
Process Flow Technologies			
Process Valves and Related Products	$ 717.1	$ 631.6	$ 685.1
Commercial Valves	374.2	286.3	332.1
Pumps and Systems	105.3	87.9	100.2
Total Process Flow Technologies	$ 1,196.6	$ 1,005.8	$ 1,117.4
Payment & Merchandising Technologies			
Payment Acceptance and Dispensing Products	$ 805.7	$ 670.8	$ 805.5
Banknotes and Security Products	539.4	434.0	352.8
Total Payment & Merchandising Technologies	$ 1,345.1	$ 1,104.8	$ 1,158.3
Total Net Sales	$ 3,180.0	$ 2,761.3	$ 3,074.5

Remaining Performance Obligations

The transaction price allocated to remaining performance obligations represents the transaction price of firm orders which have not yet been fulfilled, which we also refer to as total backlog. As of December 31, 2021, backlog was $1,255.7 million. We expect to recognize approximately 94% of our remaining performance obligations as revenue in 2022, an additional 5% by 2023 and the balance thereafter.

Contract Assets and Contract Liabilities

Contract assets represent unbilled amounts that typically arise from contracts for customized products or contracts for products sold directly to the U.S. government or indirectly to the U.S. government through subcontracts, where revenue recognized using the cost-to-cost method exceeds the amount billed to the customer. Contract assets are assessed for impairment and recorded at their net realizable value. Contract liabilities represent advance payments from customers. Revenue related to contract liabilities is recognized when control is transferred to the customer. We report contract assets, which are included within "Other current assets" in our Consolidated Balance Sheets, and contract liabilities, which are included within "Accrued liabilities" on our Consolidated Balance Sheets, on a contract-by-contract net basis at the end of each reporting period. Net contract assets and contract liabilities consisted of the following:

(in millions) December 31,	2021	2020
Contract assets	$ 73.0	$ 66.7
Contract liabilities	$ 101.1	$ 103.0

During 2021 we recognized revenue of $92.8 million related to contract liabilities as of December 31, 2020.

Note 6 – Research and Development

Research and development costs are expensed when incurred.

(in millions) December 31,	2021	2020	2019
Research and Development Costs	$ 81.4	$ 74.1	$ 74.0

Note 7 – Pension and Postretirement Benefits

Pension Plan

In the United States, we sponsor a defined benefit pension plan that covers approximately 16% of all U.S. employees. Effective January 1, 2013, pension eligible non-union employees no longer earn future benefits in the domestic defined benefit pension plan. The benefits are based on years of service and compensation on a final average pay basis, except for certain hourly employees where benefits are fixed per year of service. Charges to expense are based upon costs computed by an independent actuary. Contributions are intended to provide for future benefits earned to date. Additionally, a number of our non-U.S. subsidiaries sponsor defined benefit pension plans that cover approximately 9% of all non-U.S. employees. The benefits are typically based upon years of service and compensation. Most of these plans are funded by company contributions to pension funds, which are held for the sole benefit of plan participants and beneficiaries.

Postretirement Plans

Postretirement health care and life insurance benefits are provided for certain employees hired before January 1, 1990, who meet minimum age and service requirements. As a result of the acquisition of Crane Currency, we also have postretirement medical and Medicare supplement that cover substantially all former full-time U.S. employees of Crane Currency.

A summary of the projected benefit obligations, fair value of plan assets and funded status is as follows:

	Pension Benefits		Postretirement Benefits	
(in millions) December 31,	2021	2020	2021	2020
Change in benefit obligation:				
Benefit obligation at beginning of year	$ 1,259.8	$ 1,168.7	$ 30.0	$ 29.0
Service cost	6.0	6.4	0.3	0.3
Interest cost	18.4	26.1	0.6	0.9
Plan participants' contributions	0.4	0.5	—	—
Amendments	(0.7)	(0.2)	—	—
Actuarial (gain) loss	(64.8)	94.8	(0.2)	2.0
Settlements	(6.1)	(9.3)	—	—
Curtailments	0.5	(3.5)	—	—
Benefits paid	(49.5)	(46.8)	(2.6)	(2.2)
Foreign currency exchange and other	(10.9)	23.6	—	—
Administrative expenses paid	(1.0)	(0.5)	—	—
Benefit obligation at end of year	$ 1,152.1	$ 1,259.8	$ 28.1	$ 30.0
Change in plan assets:				
Fair value of plan assets at beginning of year	$ 1,024.1	$ 965.8	$ —	$ —
Actual return on plan assets	96.2	70.3	—	—
Employer contributions	26.7	26.1	2.6	2.2
Plan participants' contributions	0.4	0.5	—	—
Settlements	(6.1)	(9.3)	—	—
Benefits paid	(49.5)	(46.8)	(2.6)	(2.2)
Foreign currency exchange and other	(8.8)	18.5	—	—
Administrative expenses paid	(1.6)	(1.0)	—	—
Fair value of plan assets at end of year	$ 1,081.4	$ 1,024.1	$ —	$ —
Funded status	$ (70.7)	$ (235.7)	$ (28.1)	$ (30.0)

In the U.S., 2021 actuarial gains in the projected benefit obligation were primarily the result of an increase in the discount rate. Other sources of gains or losses such as plan experience, updated census data and minor adjustments to actuarial assumptions generated combined losses of less than 1% of expected year end obligations. In the Non-U.S. countries, 2021 actuarial gains in the projected benefit obligation were primarily the result of increases in discount rates. Other sources of gains or losses such as plan experience, updated census data, changes to forecast inflation, mortality table updates and minor adjustments to other actuarial assumptions generated combined gains of 2% of expected year end obligations.

In the U.S., 2020 actuarial losses in the projected benefit obligation were primarily the result of a decrease in the discount rate. Other sources of gains or losses such as plan experience, updated census data and minor adjustments to actuarial assumptions generated combined losses of less than 1% of expected year end obligations. In the Non-U.S. countries, 2020 actuarial losses in the projected benefit obligation were primarily the result of decreases in discount rates. Other sources of gains or losses such as plan experience, updated census data, changes to forecast inflation and minor adjustments to actuarial assumptions generated combined gains of 5% of expected year end obligations.

Amounts recognized on our Consolidated Balance Sheets consist of:

	Pension Benefits		Postretirement Benefits	
(in millions) December 31,	2021	2020	2021	2020
Other assets	$ 132.1	$ 62.6	$ —	$ —
Current liabilities	(1.5)	(1.5)	(2.5)	(2.6)
Accrued pension and postretirement benefits	(201.3)	(296.8)	(25.6)	(27.4)
Funded status	$ (70.7)	$ (235.7)	$ (28.1)	$ (30.0)

Amounts recognized in accumulated other comprehensive loss consist of:

	Pension Benefits		Postretirement Benefits	
(in millions) December 31,	2021	2020	2021	2020
Net actuarial loss (gain)	$ 400.0	$ 532.3	$ (1.1)	$ (0.9)
Prior service credit	(1.6)	(2.8)	(3.1)	(4.1)
Total recognized in accumulated other comprehensive loss	$ 398.4	$ 529.5	$ (4.2)	$ (5.0)

The projected benefit obligation, accumulated benefit obligation and fair value of plan assets for the U.S. and Non-U.S. plans, are as follows:

	Pension Obligations/Assets					
	U.S.		Non-U.S.		Total	
(in millions) December 31,	2021	2020	2021	2020	2021	2020
Projected benefit obligation	$ 669.7	$ 699.1	$ 482.4	$ 560.7	$ 1,152.1	$ 1,259.8
Accumulated benefit obligation	669.7	699.1	473.6	548.9	1,143.3	1,248.0
Fair value of plan assets	522.2	482.8	559.2	541.3	1,081.4	1,024.1

Information for pension plans with an accumulated benefit obligation in excess of plan assets is as follows:

(in millions) December 31,	2021	2020
Projected benefit obligation	$ 771.6	$ 1,060.4
Accumulated benefit obligation	$ 720.1	$ 1,049.5
Fair value of plan assets	$ 525.2	$ 762.5

Components of net periodic (benefit) cost are as follows:

	Pension Benefits			Postretirement Benefits		
(in millions) For the year ended December 31,	2021	2020	2019	2021	2020	2019
Net Periodic (Benefit) Cost:						
Service cost	$ 6.0	$ 6.4	$ 5.4	$ 0.3	$ 0.3	$ 0.3
Interest cost	18.4	26.1	32.7	0.6	0.9	1.1
Expected return on plan assets	(54.6)	(57.5)	(53.7)	—	—	—
Amortization of prior service cost	(0.1)	(0.3)	(0.3)	(1.1)	(1.1)	(1.1)
Amortization of net loss (gain)	23.4	19.1	15.3	—	—	(0.3)
Recognized curtailment (gain) loss	(1.3)	(2.3)	—	—	—	—
Settlement loss	1.4	1.7	—	—	—	—
Net periodic (benefit) cost	$ (6.8)	$ (6.8)	$ (0.6)	$ (0.2)	$ 0.1	$ —

The weighted average assumptions used to determine benefit obligations are as follows:

	Pension Benefits			Postretirement Benefits		
For the year ended December 31,	2021	2020	2019	2021	2020	2019
U.S. Plans:						
Discount rate	2.89 %	2.62 %	3.34 %	2.70 %	2.30 %	3.20 %
Rate of compensation increase	N/A	N/A	N/A	N/A	N/A	N/A
Interest credit rate	1.47 %	0.93 %	2.83 %	N/A	N/A	N/A
Non-U.S. Plans:						
Discount rate	1.58 %	1.07 %	1.70 %	N/A	N/A	N/A
Rate of compensation increase	3.08 %	3.10 %	2.89 %	N/A	N/A	N/A
Interest credit rate	0.33 %	0.29 %	0.22 %	N/A	N/A	N/A

The weighted-average assumptions used to determine net periodic benefit cost are as follows:

	Pension Benefits			Postretirement Benefits		
For the year ended December 31,	2021	2020	2019	2021	2020	2019
U.S. Plans:						
Discount rate	2.62 %	3.34 %	4.36 %	2.30 %	3.20 %	4.10 %
Expected rate of return on plan assets	6.50 %	7.25 %	7.25 %	N/A	N/A	N/A
Rate of compensation increase	N/A	N/A	N/A	N/A	N/A	N/A
Interest credit rate	0.93 %	2.83 %	2.40 %	N/A	N/A	N/A
Non-U.S. Plans:						
Discount rate	1.07 %	1.70 %	2.42 %	N/A	N/A	N/A
Expected rate of return on plan assets	4.45 %	5.31 %	5.34 %	N/A	N/A	N/A
Rate of compensation increase	3.10 %	2.89 %	3.06 %	N/A	N/A	N/A
Interest credit rate	0.29 %	0.22 %	0.84 %	N/A	N/A	N/A

The long-term expected rate of return on plan assets assumptions were determined with input from independent investment consultants and plan actuaries, utilizing asset pricing models and considering historical returns. The discount rates used by us for valuing pension liabilities are based on a review of high-quality corporate bond yields with maturities approximating the remaining life of the projected benefit obligations.

In the U.S. plan, the 6.50% expected rate of return on assets assumption for 2021 reflected a long-term target comprised of an asset allocation range of 25%-75% equity securities, 15%-35% fixed income securities, 10%-35% alternative assets and 0%-10% cash and cash equivalents. As of December 31, 2021, the actual asset allocation for the U.S. plan was 64.4% equity securities, 22.3% fixed income securities, 12.6% alternative assets and 0.7% cash and cash equivalents.

For the non-U.S. plans, the 4.45% expected rate of return on assets assumption for 2021 reflected a weighted average of the long-term asset allocation targets for our various non-U.S. plans. As of December 31, 2021, the actual weighted average asset allocation for the non-U.S. plans was 24.9% equity securities, 39.8% fixed income securities, 30.5% alternative assets/other and 4.8% cash and cash equivalents.

The assumed health care cost trend rates are as follows:

December 31,	2021	2020
Health care cost trend rate assumed for next year	7.25 %	6.50 %
Rate to which the cost trend rate is assumed to decline (the ultimate trend rate)	4.50 %	4.50 %
Year that the rate reaches the ultimate trend rate	2033	2029

Assumed health care cost trend rates have a significant effect on the amounts reported for our health care plans.

Plan Assets

Our pension plan target allocations and weighted-average asset allocations by asset category are as follows:

	Target Allocation	Actual Allocation	
Asset Category December 31,		2021	2020
Equity securities	15%-75%	44 %	44 %
Fixed income securities	15%-75%	31 %	26 %
Alternative assets/Other	0%-45%	22 %	27 %
Cash and money market	0%-10%	3 %	3 %

Independent investment consultants are retained to assist in executing the plans' investment strategies. A number of factors are evaluated in determining if an investment strategy will be implemented in our pension trusts. These factors include, but are not limited to, investment style, investment risk, investment manager performance and costs. We periodically review investment managers and their performance in relation to our plans' investment objectives.

The primary investment objective of our various pension trusts is to maximize the value of plan assets, focusing on capital preservation, current income and long-term growth of capital and income. The plans' assets are typically invested in a broad range of equity securities, fixed income securities, alternative assets and cash instruments.

Equity securities include investments in large, mid, and small-capitalization companies located in both developed countries and emerging markets around the world. Fixed income securities include government bonds of various countries, corporate bonds that are primarily investment-grade, and mortgage-backed securities. Alternative assets include investments in real estate and hedge funds employing a wide variety of strategies. Equity securities include Crane Co. common stock, which represents 4% of plan assets as of December 31, 2021 and 2020.

The fair value of our pension plan assets as of December 31, 2021, by asset category, are as follows:

(in millions)	Active Markets for Identical Assets Level 1	Other Observable Inputs Level 2	Unobservable Inputs Level 3	Net Asset Value ("NAV") Practical Expedient (a)	Total Fair Value
Cash Equivalents and Money Markets	$ 30.5	$ —	$ —	$ —	$ 30.5
Common Stocks					
Actively Managed U.S. Equities	112.8	—	—	—	112.8
Commingled and Mutual Funds					
U.S. Equity Funds	129.1	—	—	—	129.1
Non-U.S. Equity Funds	93.7	—	—	139.3	233.0
U.S. Fixed Income, Government and Corporate	116.2	—	—	—	116.2
Registered Investment Company	34.0	—	—	—	34.0
Collective Trust	—	—	21.7	19.0	40.7
Non-U.S. Fixed Income, Government and Corporate	—	—	—	222.6	222.6
International Balanced Funds	—	—	—	2.1	2.1
Property Funds	29.0	—	—	—	29.0
Alternative Investments					
Insurance / Annuity Contract(s)	—	14.7	—	—	14.7
Hedge Funds and LDI	—	—	—	64.0	64.0
International Property Funds	—	—	—	52.7	52.7
Total Fair Value	$ 545.3	$ 14.7	$ 21.7	$ 499.7	$ 1,081.4

(a) Investments are measured at fair value using the net asset value per share practical expedient, and therefore, are not classified in the fair value hierarchy.

In 2021, the pension plan's asset classified as Level 3 constitutes an insurance contract valued annually on an actuarial basis.

The fair value of our pension plan assets as of December 31, 2020, by asset category, are as follows:

(in millions)	Active Markets for Identical Assets Level 1	Other Observable Inputs Level 2	Unobservable Inputs Level 3	Net Asset Value ("NAV") Practical Expedient [(a)]	Total Fair Value
Cash Equivalents and Money Markets	$ 30.1	$ —	$ —	$ —	$ 30.1
Common Stocks					
Actively Managed U.S. Equities	103.2	—	—	—	103.2
Fixed Income Bonds and Notes	—	0.1	—	—	0.1
Commingled and Mutual Funds					
U.S. Equity Funds	117.3	—	—	—	117.3
Non-U.S. Equity Funds	53.2	—	—	178.0	231.2
U.S. Fixed Income, Government and Corporate	76.6	—	—	—	76.6
Registered Investment Company	18.3	—	—	—	18.3
Collective Trust	—	—	22.8	19.2	42.0
Non-U.S. Fixed Income, Government and Corporate	—	—	—	186.5	186.5
International Balanced Funds	—	—	—	1.9	1.9
Alternative Investments					
Insurance / Annuity Contract(s)	—	14.2	—	—	14.2
Hedge Funds and LDI	—	—	—	153.8	153.8
International Property Funds	—	—	—	48.9	48.9
Total Fair Value	$ 398.7	$ 14.3	$ 22.8	$ 588.3	$ 1,024.1

In 2020, the pension plan's asset classified as Level 3 constitutes an insurance contract valued annually on an actuarial basis

The following table sets forth a summary of pension plan assets valued using NAV or its equivalent as of December 31, 2021 and December 31, 2020:

	Redemption Frequency	Unfunded Commitment	Other Redemption Restrictions	Redemption Notice Period
Non-U.S. Equity Funds [(a)]	Immediate	None	None	None
Non-U.S. Fixed Income, Government and Corporate [(b)]	Immediate	None	None	None
International Balanced Funds [(c)]	Immediate	None	None	None
Collective Trust Fund [(d)]	Immediate	None	None	None
International Property Funds [(e)]	Immediate	None	None	None
Hedge Funds and LDI [(f)]	Immediate	None	None	None

(a) These funds invest in corporate equity securities outside the United States.

(b) These funds invest in corporate and government fixed income securities outside the United States.

(c) These funds invest in a blend of equities, fixed income, cash and property outside the United States.

(d) These funds are managed in a collective trust under Australia's Superannuation plan structure.

(e) These funds invest in real property outside the United States.

(f) These funds invest in strategies that seek to add diversification to a portfolio with uncorrelated risk profiles or are designed to track the duration of all or part of the underlying liability.

Cash Flows

We expect, based on current actuarial calculations, to contribute cash of approximately $18.9 million to our defined benefit pension plans during 2022. Cash contributions in subsequent years will depend on a number of factors including the investment performance of plan assets.

Estimated Future Benefit Payments

The following benefit payments, which reflect expected future service, as appropriate, are expected to be paid:

Estimated future payments (in millions)	Pension Benefits	Postretirement Benefits
2022	$ 53.6	$ 2.6
2023	53.2	2.6
2024	54.2	2.4
2025	56.4	2.3
2026	56.0	2.1
2027 to 2031	284.9	8.8
Total payments	$ 558.3	$ 20.8

Supplemental Executive Retirement Plan

We also have a non-qualified Supplemental Executive Retirement Plan ("SERP"). The SERP, which is not funded, is intended to provide retirement benefits for certain executive officers who were formerly employees of Crane Currency. Benefit amounts are based upon years of service and compensation of the participating employees. There were no pre-tax settlement gains recorded in 2021 or 2020. We recorded a pre-tax settlement gain of $0.1 million in 2019. Accrued SERP benefits were $3.7 million and $3.9 million as of December 31, 2021 and 2020, respectively. Employer contributions made to the SERP were $0.2 million, $0.2 million and $2.2 million in 2021, 2020 and 2019, respectively.

Defined Contribution Plans

We sponsor savings and investment plans that are available to our eligible employees including employees of our subsidiaries. We made contributions to the plans of $12.0 million, $11.8 million and $11.0 million in 2021, 2020 and 2019, respectively.

In addition to participant deferral contributions and company matching contributions on those deferrals, we provide a 3% non-matching contribution to eligible participants. We made non-matching contributions to these plans of $14.6 million, $14.5 million and $13.4 million in 2021, 2020 and 2019, respectively.

Note 8 – Stock-Based Compensation Plans

At December 31, 2021, we had stock-based compensation awards outstanding under the following shareholder-approved plans: the 2013 Stock Incentive Plan (the "2013 Plan"), 2018 Stock Incentive Plan (the "2018 Plan") and 2018 Amended and Restated Stock Incentive Plan (the “2018 Amended & Restated Plan”), applicable to employees and non-employee directors.

The 2013 Plan was approved by the Board of Directors and stockholders at the annual meeting in 2013. The 2013 Plan originally authorized the issuance of up to 9,500,000 shares of stock pursuant to awards under the plan. In 2018, in view of the limited number of shares remaining available under the 2013 Plan, the Board of Directors and stockholders approved the adoption of the 2018 Plan which authorized the issuance of up to 6,500,000 shares of Crane Co. stock. In 2021, the Board of Directors and stockholders approved the adoption of the 2018 Amended and Restated Stock Incentive Plan which authorized the issuance of up to 4,710,000 shares of Crane Co. stock. No further awards will be made under the 2013 Plan or 2018 Plan.

The stock incentive plans are used to provide long-term incentive compensation through stock options, restricted share units, performance-based restricted share units and deferred stock units.

Stock Options
Options are granted under the Stock Incentive Plan to officers and other key employees and directors at an exercise price equal to the closing price on the date of grant. Unless otherwise determined by the Compensation Committee which administers the plan, options become exercisable at a rate of 25% after the first year, 50% after the second year, 75% after the third year and 100% after the fourth year from the date of grant. Options granted to officers and employees from 2004 to 2013 expire six years after the date of grant. All options granted to directors and options granted to officers and employees after 2014 expire 10 years after the date of grant.

We determine the fair value of each grant using the Black-Scholes option pricing model. The weighted-average assumptions for grants made during the years ended December 31, 2021, 2020 and 2019 are as follows:

	2021	2020	2019
Dividend yield	3.06 %	3.05 %	2.20 %
Volatility	36.28 %	27.15 %	25.17 %
Risk-free interest rate	0.50 %	1.23 %	2.64 %
Expected lives in years	5.2	5.2	4.2

Expected dividend yield is based on our dividend rate. Expected stock volatility was determined based upon the historical volatility for the four-year period preceding the date of grant. The risk-free interest rate was based on the yield curve in effect at the time the options were granted, using U.S. constant maturities over the expected life of the option. The expected lives of the awards represent the period of time that options granted are expected to be outstanding.

Activity in our stock option plans for the year ended December 31, 2021 were as follows:

Option Activity	Number of Shares (in 000’s)		Weighted Average Exercise Price	Weighted Average Remaining Life (Years)
Options outstanding as of January 1, 2021	2,876	$	68.88	
Granted	155		78.59	
Exercised	(935)		57.12	
Canceled	(25)		76.84	
Options outstanding as of December 31, 2021	2,071	$	74.82	6.33
Options exercisable as of December 31, 2021	1,161	$	72.57	5.12

Included in our share-based compensation was expense recognized for our stock option awards of $6.0 million, $6.4 million and $5.7 million in 2021, 2020 and 2019, respectively.

The weighted-average fair value of options granted during 2021, 2020 and 2019 was $20.82, $15.18 and $15.79, respectively. The total fair value of shares vested during 2021, 2020 and 2019 was $6.3 million, $6.2 million and $6.3 million, respectively. The total intrinsic value of options exercised during 2021, 2020 and 2019 was $36.4 million, $4.1 million and $6.8 million, respectively. The aggregate intrinsic value of exercisable options was $33.9 million, $29.5 million and $39.4 million as of December 31, 2021, 2020 and 2019, respectively.

The total cash received from these option exercises during 2021, 2020 and 2019 was $26.4 million, $8.9 million and $11.4 million, respectively. The tax benefit realized for the tax deductions from these option exercises was $5.5 million, $0.5 million and $0.8 million as of December 31, 2021, 2020 and 2019, respectively.

As of December 31, 2021, there was $8.5 million of total future compensation cost related to unvested share-based awards to be recognized over a weighted-average period of 1.67 years.

Restricted Share Units and Performance-Based Restricted Share Units

Restricted share units vest at a rate of 25% after the first year, 50% after the second year, 75% after the third year and 100% after the fourth year from the date of grant and are subject to forfeiture restrictions which lapse over time. The vesting of performance-based restricted share units is determined in three years based on relative total shareholder return for Crane Co. compared to the S&P Midcap 400 Capital Goods Group, with payout potential ranging from 0% to 200% but capped at 100% if our three year total shareholder return is negative.

Included in our share-based compensation was expense recognized for our restricted share unit and performance-based restricted share unit awards of $18.3 million, $15.1 million and $15.6 million in 2021, 2020 and 2019, respectively. The tax (detriment) benefit for the vesting of the restricted share units was $(0.1) million, $(0.1) million and $2.8 million as of December 31, 2021, 2020 and 2019, respectively.

As of December 31, 2021, there was $27.1 million of total future compensation cost related to restricted share unit and performance-based restricted share unit awards, to be recognized over a weighted-average period of 1.98 years.

Changes in our restricted share units for the year ended December 31, 2021 were as follows:

Restricted Share Unit Activity	Restricted Share Units (in 000's)	Weighted Average Grant-Date Fair Value
Restricted share units as of January 1, 2021	485	$ 83.17
Restricted share units granted	225	80.38
Restricted share units vested	(144)	77.34
Restricted share units forfeited	(23)	81.13
Performance-based restricted share units granted	72	82.27
Performance-based restricted share units vested	(67)	88.66
Restricted share units as of December 31, 2021	548	$ 82.84

Note 9 - Leases

Arrangements that explicitly or implicitly relate to property, plant and equipment are assessed at inception to determine if the arrangement is or contains a lease. Generally, we enter into operating leases as the lessee and recognize right-of-use assets and lease liabilities based on the present value of future lease payments over the lease term.

We lease certain vehicles, equipment, manufacturing facilities, and non-manufacturing facilities. We have leases with both lease components and non-lease components, such as common area maintenance, utilities, or other repairs and maintenance. For all asset classes, we applied the practical expedient to account for each separate lease component and its associated non-lease component(s) as a single lease component.

We identify variable lease payments, such as maintenance payments based on actual activities performed or costs incurred, at lease commencement by assessing the nature of the payment provisions, including whether the payments are subject to a minimum.

Certain leases include options to renew for an additional term or company-controlled options to terminate. We generally determine it is not reasonably certain to assume the exercise of renewal options because there is no economic incentive to renew. As termination options often include penalties, we generally determine it is reasonably certain that termination options will not be exercised because there is an economic incentive not to terminate. Therefore, these options generally do not impact the lease term or the determination or classification of the right-of-use asset and lease liability.

In the third quarter of 2017, we entered into a seven-year lease for a used airplane which includes a maximum residual value guarantee of $11.1 million if the fair value of the airplane is less than $14.4 million at the end of the lease term. We do not believe it is probable that any amount will be owed under this guarantee. Therefore, no amount related to the residual value guarantee is included in the lease payments used to measure the right-of-use asset and lease liability. We have not entered into any other leases where a residual value guarantee is provided to the lessor.

Rental expense was $37.4 million, $39.5 million and $34.0 million for 2021, 2020 and 2019, respectively.

We do not enter into arrangements where restrictions or covenants are imposed by the lessor that, for example, relate to incurring additional financial obligations. Furthermore, we also have not entered into any significant sublease arrangements.

We use our collateralized incremental borrowing rate based on the information available at commencement date to determine the present value of future payments and the appropriate lease classification. The rate implicit in the lease is generally unknown, as we generally operate in the capacity of the lessee.

Our Consolidated Balance Sheet includes the following related to leases:

(in millions) December 31,	Classification	2021	2020
Assets			
Operating right-of-use assets	Other assets	$ 96.5	$ 103.7
Liabilities			
Current lease liabilities	Accrued liabilities	$ 22.5	$ 23.0
Long-term lease liabilities	Other liabilities	79.3	86.4
Total lease liabilities		$ 101.8	$ 109.4

The components of lease cost were as follows:

(in millions) December 31,	2021	2020	2019
Operating lease cost	$ 31.2	$ 32.4	$ 27.9
Variable lease cost	$ 6.2	$ 7.1	$ 6.1

The weighted average remaining lease terms and discount rates for our operating leases were as follows:

December 31,	2021	2020
Weighted-average remaining lease term - operating leases	9.4	9.8
Weighted-average discount rate - operating leases	3.6 %	3.8 %

Supplemental cash flow information related to our operating leases was as follows for periods ended December 31, 2021 and 2020:

(in millions) December 31,	2021	2020	2019
Cash paid for amounts included in measurement of operating lease liabilities - operating cash flows	$ 26.8	$ 26.5	$ 24.3
Right-of-use assets obtained in exchange for new operating lease liabilities	$ 17.0	$ 10.0	$ 21.0

Future minimum operating lease payments are as follows:

(in millions)	December 31, 2021
2022	$ 25.5
2023	22.7
2024	17.5
2025	13.8
2026	9.4
Thereafter	48.2
Total future minimum operating lease payments	$ 137.1
Imputed interest	35.3
Present value of lease liabilities reported	$ 101.8

Note 10 – Income Taxes

Provision for Income Taxes

Our income before taxes is as follows:

(in millions) For year ended December 31,	2021	2020	2019
U.S. operations	$ 316.5	$ 102.2	$ 37.2
Non-U.S. operations	160.7	99.6	106.7
Total	$ 477.2	$ 201.8	$ 143.9

Our provision (benefit) for income taxes consists of:

(in millions) For the year ended December 31,	2021	2020	2019
Current:			
U.S. federal tax	$ 34.5	$ 8.6	$ 28.5
U.S. state and local tax	3.4	1.6	2.1
Non-U.S. tax	34.2	12.4	29.0
Total current	72.1	22.6	59.6
Deferred:			
U.S. federal tax	12.2	14.9	(28.8)
U.S. state and local tax	(2.0)	(0.6)	2.2
Non-U.S. tax	0.6	1.7	(1.7)
Total deferred	10.8	16.0	(28.3)
Total provision for income taxes *	$ 82.9	$ 38.6	$ 31.3

* Included in the above amounts are excess tax benefits from share-based compensation of $5.4 millions $0.4 millions and $3.6 millions in 2021, 2020 and 2019, respectively, which were reflected as reductions in our provision for income taxes in 2021, 2020 and 2019.

A reconciliation of the statutory U.S. federal tax rate to our effective tax rate is as follows:

For the year ended December 31,	2021	2020	2019
Statutory U.S. federal tax rate	21.0 %	21.0 %	21.0 %
Increase (reduction) from:			
Income taxed at non-U.S. rates	0.2 %	(3.4)%	3.1 %
Non-U.S. income inclusion, net of tax credits	(1.6)%	2.5 %	4.0 %
State and local taxes, net of federal benefit	0.2 %	0.3 %	2.3 %
U.S. research and development tax credit	(0.6)%	(2.5)%	(2.0)%
U.S. deduction for foreign - derived intangible income	(1.0)%	(0.4)%	(5.7)%
Other	(0.8)%	1.6 %	(1.0)%
Effective tax rate	17.4 %	19.1 %	21.7 %

As of December 31, 2021, we have made the following determinations with regard to our non-U.S. earnings:

(in millions)	Permanently reinvested	Not permanently reinvested
Amount of earnings	$ 333.2	$ 1,294
Associated tax	NA *	$ 14.3

* Determination of U.S. income taxes and non-U.S. withholding taxes due upon repatriation of this $333.2 million of earnings is not practicable because the amount of such taxes depends upon circumstances existing in numerous taxing jurisdictions at the time the remittance occurs.

Tax Related to Comprehensive Income

During 2021, 2020 and 2019, tax (benefit) provision of $29.9 million, $(13.5) million and $(12.6) million, respectively, related to changes in pension and post-retirement plan assets and benefit obligations, were recorded to accumulated other comprehensive loss.

Deferred Taxes and Valuation Allowances

The components of deferred tax assets and liabilities included in our Consolidated Balance Sheets are as follows:

(in millions) December 31,	2021	2020
Deferred tax assets:		
Asbestos-related liabilities	$ 138.9	$ 150.3
Tax loss and credit carryforwards	111.2	124.5
Pension and post-retirement benefits	24.1	66.0
Inventories	28.7	29.5
Other	34.9	40.2
Total	$ 337.8	$ 410.5
Less: valuation allowance	141.5	153.4
Total deferred tax assets, net of valuation allowance	$ 196.3	$ 257.1
Deferred tax liabilities:		
Basis difference in fixed assets	$ (42.9)	$ (55.6)
Basis difference in intangible assets	(185.9)	(191.4)
Other	(20.9)	(22.7)
Total deferred tax liabilities	$ (249.7)	$ (269.7)
Net deferred tax asset (liability)	$ (53.4)	$ (12.6)
Balance sheet classification:		
Long-term deferred tax assets	17.7	41.0
Long-term deferred tax liability	(71.1)	(53.6)
Net deferred tax asset (liability)	$ (53.4)	$ (12.6)

As of December 31, 2021, we had U.S. federal, U.S. state and non-U.S. tax loss and credit carryforwards that will expire, if unused, as follows:

(in millions) Year of expiration	U.S. Federal Tax Credits	U.S. Federal Tax Losses	U.S. State Tax Credits	U.S. State Tax Losses	Non- U.S. Tax Losses	Total
2022-2026	$ —	$ —	$ 2.7	$ 114.3	$ 5.3	
After 2026	3.8	0.7	1.7	764.2	5.8	
Indefinite	—	—	22.0	9.5	184.8	
Total tax carryforwards	$ 3.8	$ 0.7	$ 26.4	$ 888.0	$ 195.9	
Deferred tax asset on tax carryforwards	$ 3.8	$ 0.2	$ 21.1	$ 43.9	$ 42.2	$ 111.2
Valuation allowance on tax carryforwards	(3.8)	(0.2)	(20.3)	(42.2)	(39.9)	(106.4)
Net deferred tax asset on tax carryforwards	$ —	$ —	$ 0.8	$ 1.7	$ 2.3	$ 4.8

As of December 31, 2021 and 2020, we determined that it was more likely than not that $106.4 million and $118.3 million, respectively, of our deferred tax assets related to tax loss and credit carryforwards will not be realized. As a result, we recorded a valuation allowance against these deferred tax assets. We also determined that it is more likely than not that a portion of the benefit related to U.S. state and non-U.S. deferred tax assets other than tax loss and credit carryforwards will not be realized. Accordingly, as of December 31, 2021 and 2020, a valuation allowance of $35.1 million and $35.1 million, respectively, was established against these U.S. state and non-U.S. deferred tax assets. Our total valuation allowance as of December 31, 2021 and 2020 was $141.5 million and $153.4 million, respectively.

Unrecognized Tax Benefits

A reconciliation of the beginning and ending amount of our gross unrecognized tax benefits, excluding interest and penalties, is as follows:

(in millions)	2021	2020	2019
Balance of liability as of January 1,	$ 34.0	$ 39.8	$ 42.0
Increase as a result of tax positions taken during a prior year	0.7	5.4	1.1
Decrease as a result of tax positions taken during a prior year	(0.3)	(0.4)	(0.5)
Increase as a result of tax positions taken during the current year	2.6	1.8	3.2
Decrease as a result of settlements with taxing authorities	(0.8)	(2.5)	—
Reduction as a result of a lapse of the statute of limitations	(4.6)	(10.1)	(6.0)
Balance of liability as of December 31,	$ 31.6	$ 34.0	$ 39.8

As of December 31, 2021, 2020 and 2019, the amount of our unrecognized tax benefits that, if recognized, would affect our effective tax rate were $33.5 million, $32.6 million and $43.8 million, respectively. The difference between these amounts and those reflected in the table above relates to (1) offsetting tax effects from other tax jurisdictions, and (2) interest expense, net of deferred taxes and (3) unrecognized tax benefits whose reversals would be recorded to goodwill.

We recognize interest and penalties related to unrecognized tax benefits as a component of our income tax expense. During the years ended December 31, 2021, 2020 and 2019, we recognized interest and penalty (income)/ expense of $(2.6) million, $(0.5) million and $0.8 million, respectively, in our Consolidated Statements of Operations. As of December 31, 2021 and 2020, we had accrued $4.9 million and $7.5 million, respectively, of interest and penalties related to unrecognized tax benefits on our Consolidated Balance Sheets.

During the next twelve months, it is reasonably possible that our unrecognized tax benefits could change by $6.6 million due to settlements of income tax examinations, the expiration of statutes of limitations or other resolution of uncertainties. However, if the ultimate resolution of income tax examinations results in amounts that differ from this estimate, we will record additional income tax expense or benefit in the period in which such matters are effectively settled.

Income Tax Examinations

Our income tax returns are subject to examination by the U.S. federal, U.S. state and local, and non-U.S. tax authorities. With few exceptions, the years for which we filed returns that are open to examination are as follows:

Jurisdiction	Year
U.S. federal	2018 - 2020
U.S. state and local	2015 - 2020
Non-U.S.	2015 - 2020

Currently, we and our subsidiaries are under examination in various jurisdictions, including Germany (2016 through 2019), Canada (2013 through 2015) and Luxembourg (2017 through 2018).

Note 11 – Accrued Liabilities

Accrued liabilities consist of:

(in millions) December 31,	2021	2020
Employee related expenses	$ 175.1	$ 120.5
Warranty	7.3	8.1
Current lease liabilities	22.5	23.0
Contract liabilities	101.1	103.0
Other	124.7	133.4
Total	$ 430.7	$ 388.0

We accrue warranty liabilities when it is probable that a liability has been incurred and the amount of the loss can be reasonably estimated. Warranty provision is included in "Cost of sales" in our Consolidated Statements of Operations.

A summary of the warranty liabilities is as follows:

(in millions) December 31,	2021	2020	2019
Balance at beginning of period	$ 8.1	$ 9.8	$ 17.2
Expense	7.6	8.0	8.5
Changes due to acquisitions/divestitures	—	0.3	—
Payments / deductions	(8.4)	(10.1)	(15.8)
Currency translation	—	0.1	(0.1)
Balance at end of period	$ 7.3	$ 8.1	$ 9.8

Note 12 – Other Liabilities

(in millions) December 31,	2021	2020
Environmental	$ 25.8	$ 29.4
Long-term lease liabilities	79.3	86.4
Other	56.0	55.5
Total	$ 161.1	$ 171.3

Note 13 - Commitments and Contingencies

Asbestos Liability

Information Regarding Claims and Costs in the Tort System

As of December 31, 2021, we were a defendant in cases filed in numerous state and federal courts alleging injury or death as a result of exposure to asbestos. Activity related to asbestos claims during the periods indicated was as follows:

For the year ended December 31,	2021	2020	2019
Beginning claims	29,138	29,056	29,089
New claims	2,975	2,620	2,848
Settlements	(980)	(885)	(983)
Dismissals	(1,175)	(1,653)	(1,898)
Ending claims	29,958	29,138	29,056

Of the 29,958 pending claims as of December 31, 2021, approximately 18,000 claims were pending in New York of which approximately 16,000 are non-malignancy claims that were filed over 15 years ago and have been inactive under New York court orders.

We have tried several cases resulting in defense verdicts by the jury or directed verdicts for the defense by the court. We further have pursued appeals of certain adverse jury verdicts that have resulted in reversals in favor of the defense. We have also tried several other cases resulting in plaintiff verdicts which we paid or settled after unsuccessful appeals.

The gross settlement and defense costs incurred (before insurance recoveries and tax effects) by us for the years ended December 31, 2021, 2020 and 2019 totaled $55.2 million, $50.9 million and $66.2 million, respectively. In contrast to the recognition of settlement and defense costs, which reflect the current level of activity in the tort system, cash payments and receipts generally lag the tort system activity by several months or more, and may show some fluctuation from period to period. Cash payments of settlement amounts are not made until all releases and other required documentation are received by us, and reimbursements of both settlement amounts and defense costs by insurers may be uneven due to insurer payment practices, transitions from one insurance layer to the next excess layer and the payment terms of certain reimbursement agreements. Our total pre-tax payments for settlement and defense costs, net of funds received from insurers, for the years ended December 31, 2021, 2020 and 2019 totaled $44.9 million, $31.1 million and $41.5 million, respectively. Detailed below are the comparable amounts for the periods indicated.

(in millions)			
For the year ended December 31,	2021	2020	2019
Settlement / indemnity costs incurred [(a)]	$ 40.6	$ 35.3	$ 45.5
Defense costs incurred [(a)]	14.6	15.6	20.7
Total costs incurred	$ 55.2	$ 50.9	$ 66.2
Settlement / indemnity payments	$ 42.6	$ 24.7	$ 38.9
Defense payments	15.4	16.7	21.4
Insurance receipts	(13.1)	(10.3)	(18.8)
Pre-tax cash payments, net	$ 44.9	$ 31.1	$ 41.5

(a) Before insurance recoveries and tax effects.

The amounts shown for settlement and defense costs incurred, and cash payments, are not necessarily indicative of future period amounts, which may be higher or lower than those reported.

Cumulatively through December 31, 2021, we have resolved (by settlement or dismissal) approximately 143,000 claims. The related settlement cost incurred by us and our insurance carriers is approximately $720 million, for an average settlement cost per resolved claim of approximately $5,000. The average settlement cost per claim resolved during the years ended December 31, 2021, 2020 and 2019 was $18,800, $13,900, and $15,800, respectively. Because claims are sometimes dismissed in large groups, the average cost per resolved claim, as well as the number of open claims, can fluctuate significantly from period to period. In addition to large group dismissals, the nature of the disease and corresponding settlement amounts for each claim resolved will also drive changes from period to period in the average settlement cost per claim. Accordingly, the average cost per resolved claim is not considered in our periodic review of our estimated asbestos liability. For a discussion regarding the four most significant factors affecting the liability estimate, see "Effects on the Consolidated Financial Statements."

Effects on the Consolidated Financial Statements

We have retained an independent actuarial firm to assist management in estimating our asbestos liability in the tort system. The actuarial consultants review information provided by us concerning claims filed, settled and dismissed, amounts paid in settlements and relevant claim information such as the nature of the asbestos-related disease asserted by the claimant, the jurisdiction where filed and the time lag from filing to disposition of the claim. The methodology used by the actuarial consultants to project future asbestos costs is based on our recent historical experience for claims filed, settled and dismissed during a base reference period. Our experience is then compared to estimates of the number of individuals likely to develop asbestos-related diseases determined based on widely used previously conducted epidemiological studies augmented with current data inputs. Those studies were undertaken in connection with national analyses of the population of workers believed to have been exposed to asbestos. Using that information, the actuarial consultants estimate the number of future claims that would be filed against us and estimates the aggregate settlement or indemnity costs that would be incurred to resolve both pending and future claims based upon the average settlement costs by disease during the reference period. This methodology has been accepted by numerous courts. After discussions with us, the actuarial consultants augment our liability estimate for the costs of defending asbestos claims in the tort system using a forecast from us which is based upon discussions with our defense counsel. Based on this information, the actuarial consultants compile an estimate of our asbestos liability for pending and future claims using a range of reference periods based on claim experience and claims expected to be filed through the indicated forecast period. The most significant factors affecting the liability estimate are (1) the number of new mesothelioma claims filed against us, (2) the average settlement costs for mesothelioma claims, (3) the percentage of mesothelioma claims dismissed against us and (4) the aggregate defense costs incurred by us. These factors are interdependent, and no one factor predominates in determining the liability estimate.

In our view, the forecast period used to provide the best estimate for asbestos claims and related liabilities and costs is a judgment based upon a number of trend factors, including the number and type of claims being filed each year; the jurisdictions where such claims are filed, and the effect of any legislation or judicial orders in such jurisdictions restricting the types of claims that can proceed to trial on the merits; and the likelihood of any comprehensive asbestos legislation at the federal level. In addition, the dynamics of asbestos litigation in the tort system have been significantly affected by the substantial number of companies that have filed for bankruptcy protection, thereby staying any asbestos claims against them until the conclusion of such proceedings, and the establishment of a number of post-bankruptcy trusts for asbestos claimants, which have been estimated to provide $36 billion for payments to current and future claimants. These trend factors have both positive and negative effects on the dynamics of asbestos litigation in the tort system and the related best estimate of our asbestos liability, and these effects do not move in a linear fashion but rather change over multi-year periods. Accordingly, management continues to monitor these trend factors over time and periodically assesses whether an alternative forecast period is appropriate.

Each quarter, the actuarial consultants compile an update based upon our experience in claims filed, settled and dismissed as well as average settlement costs by disease category (mesothelioma, lung cancer, other cancer, and non-malignant conditions including asbestosis). In addition to this claims experience, we also consider additional quantitative and qualitative factors such as the nature of the aging of pending claims, significant appellate rulings and legislative developments, and their respective effects on expected future settlement values. As part of this process, we also consider trends in the tort system such as those enumerated above. Management considers all these factors in conjunction with the liability estimate of the actuarial consultants and determines whether a change in the estimate is warranted.

Liability Estimate. In June 2016, the New York State Court of Appeals issued its opinion in *Dummitt v. Crane Co*., affirming a 2012 verdict for $4.9 million against us. In that opinion, the court ruled that in certain circumstances we are legally responsible for asbestos-containing materials made and sold by third parties that others attached post-sale to our equipment. This decision provided clarity regarding the nature of claims that may proceed to trial in New York and greater predictability regarding future claim activity. We also reflected the impact of the *Dummitt* decision on our expected settlement values. Accordingly, on December 31, 2016, we updated and extended our asbestos liability estimate through 2059, the generally accepted end point.

Following our experience in the tort system post the *Dummitt* decision, we entered into several, increasingly similar, group settlements with various plaintiff firms and we expect this new trend of these types of group settlements to continue. Accordingly, effective as of December 31, 2019, we updated our estimate of the asbestos liability, including revised costs of settlement or indemnity payments and defense costs relating to currently pending claims and future claims projected to be filed against us through the same expected end point of 2059. Our estimate of the asbestos liability for pending and future claims through 2059 is based on the projected future asbestos costs resulting from our experience using a range of reference periods for claims filed, settled and dismissed. Based on this estimate, we recorded an additional liability of $255 million as of December 31, 2019.

An aggregate liability of $712 million was recorded as of December 31, 2019 to cover the estimated cost of asbestos claims now pending or subsequently asserted through 2059, of which approximately 85% is attributable to settlement and defense costs for future claims projected to be filed through 2059. The liability is reduced when cash payments are made in respect of settled claims and defense costs. The liability was $612 million and $670 million as of December 31, 2021 and 2020, respectively. It is not possible to forecast when cash payments related to the asbestos liability will be fully expended; however, it is expected such cash payments will continue for a number of years past 2059, due to the significant proportion of future claims included in the estimated asbestos liability and the lag time between the date a claim is filed and when it is resolved. None of these estimated costs have been discounted to present value due to the inability to reliably forecast the timing of payments. The current portion of the total estimated liability at December 31, 2021 and 2020 is $62.3 million and $66.5 million, respectively and represents our best estimate of total asbestos costs expected to be paid during the twelve-month period. Such amount is based upon the actuarial model together with our prior year payment experience for both settlement and defense costs.

We have made our best estimate of the costs through 2059. Through December 31, 2021, our actual experience during the updated reference period for mesothelioma claims filed and dismissed generally approximated the assumptions in our liability estimate. In addition to this claims experience, we considered additional quantitative and qualitative factors such as the nature of the aging of pending claims, significant appellate rulings and legislative developments, and their respective effects on expected future settlement values. Based on this evaluation, we determined that no change in the estimate was warranted for the period ended December 31, 2021.

Insurance Coverage and Receivables. Prior to 2005, a significant portion of our settlement and defense costs were paid by our primary insurers. With the exhaustion of that primary coverage, we began negotiations with our excess insurers to reimburse us for a portion of our settlement and/or defense costs as incurred. To date, we have entered into agreements providing for such reimbursements, known as “coverage-in-place,” with eleven of our excess insurer groups. Under such coverage-in-place agreements, an insurer’s policies remain in force and the insurer undertakes to provide coverage for our present and future asbestos claims on specified terms and conditions that address, among other things, the share of asbestos claims costs to be paid by the insurer, payment terms, claims handling procedures and the expiration of the insurer’s obligations. Similarly, under a variant of coverage-in-place, we have entered into an agreement with a group of insurers confirming the aggregate amount of available coverage under the subject policies and setting forth a schedule for future reimbursement payments to us based on aggregate indemnity and defense payments made. In addition, with ten of our excess insurer groups, we entered into agreements settling all asbestos and other coverage obligations for an agreed sum and received a total of $82.5 million in aggregate as a result of those settlements. Reimbursements from insurers for past and ongoing settlement and defense costs allocable to their policies have been made in accordance with these coverage-in-place and other agreements. All these agreements include provisions for mutual releases, indemnification of the insurer and, for coverage-in-place, claims handling procedures. With the agreements referenced above, we have concluded settlements with all but two of our solvent excess insurers with policies expected to respond to the aggregate costs included in the liability estimate. The first such insurer, which issued a single applicable policy, has been paying for many years the shares of defense and indemnity costs we have allocated to it, subject to a reservation of rights. The second insurer issued a single applicable policy in a layer of coverage that we do not anticipate reaching until many years from now, and, prior to the policy being reached, we anticipate opening a dialogue with that insurer about the execution of a suitable agreement. There are no pending legal proceedings between us and any insurer contesting our asbestos claims under our insurance policies.

In conjunction with developing the aggregate updated liability estimate referenced above, we also developed an updated estimate of probable insurance recoveries for our asbestos liabilities. In developing this estimate, we considered our coverage-in-place and other settlement agreements described above, as well as several additional factors. These additional factors include the financial viability of the insurance companies, the method by which losses will be allocated to the various insurance policies and the years covered by those policies, how settlement and defense costs will be covered by the insurance policies and interpretation of the effect on coverage of various policy terms and limits. In addition, the timing and amount of reimbursements will vary because our insurance coverage for asbestos claims involves multiple insurers, with different policy terms and certain gaps in coverage. In addition to consulting with legal counsel on these insurance matters, we retained insurance consultants to assist management in the estimation of probable insurance recoveries based upon the aggregate liability estimate described above and assuming the continued viability of all solvent insurance carriers. Based upon the analysis of policy terms and other factors noted above by our legal counsel, and incorporating risk mitigation judgments by us where policy terms or other factors were not certain, our insurance consultants compiled a model indicating how our historical insurance policies would respond to varying levels of asbestos settlement and defense costs and the allocation of such costs between such insurers and us. Using the estimated liability as of December 31, 2019 (for claims filed or expected to be filed through 2059), the insurance consultant's model forecasted that approximately 14% of the liability would be reimbursed by our insurers. While there are overall limits on the aggregate amount of insurance available to us with respect to asbestos claims, certain limits were not reached by the total estimated liability currently recorded by us, and such overall limits did not influence our determination of the asset amount to record. We allocate to ourselves the amount of the asbestos liability (for claims filed or expected to be filed through 2059) that is in excess of available insurance coverage allocated to such years. An asset of $98 million was recorded as of December 31, 2019 representing the probable insurance reimbursement for claims expected through 2059. The asset is reduced as reimbursements and other payments from insurers are received. The asset was $74 million and $87 million as of December 31, 2021 and 2020, respectively.

We review the estimated reimbursement rate with our insurance consultants on a periodic basis in order to confirm overall consistency with our established reserves. The reviews encompass consideration of the performance of the insurers under coverage-in-place agreements and the effect of any additional lump-sum payments under other insurer agreements. Actual insurance reimbursements vary from period to period, and will decline over time, for the reasons cited above.

Uncertainties. Estimation of our ultimate exposure for asbestos-related claims is subject to significant uncertainties, as there are multiple variables that can affect the timing, severity and quantity of claims and the manner of their resolution. We caution that our estimated liability is based on assumptions with respect to future claims, settlement and defense costs based on past experience that may not prove reliable as predictors; the assumptions are interdependent and no single factor predominates in determining the liability estimate. A significant upward or downward trend in the number of claims filed, depending on the nature of the alleged injury, the jurisdiction where filed and the quality of the product identification, or a significant upward or downward trend in the costs of defending claims, could change the estimated liability, as would substantial adverse verdicts at trial that withstand appeal. A legislative solution, structured settlement transaction, or significant change in relevant case law could also change the estimated liability.

The same factors that affect developing estimates of probable settlement and defense costs for asbestos-related liabilities also affect estimates of the probable insurance reimbursements, as do a number of additional factors. These additional factors include the financial viability of the insurance companies, the method by which losses will be allocated to the various insurance policies and the years covered by those policies, how settlement and defense costs will be covered by the insurance policies and interpretation of the effect on coverage of various policy terms and limits and their interrelationships. In addition, due to the uncertainties inherent in litigation matters, no assurances can be given regarding the outcome of any litigation, if necessary, to enforce our rights under our insurance policies or settlement agreements.

Many uncertainties exist surrounding asbestos litigation, and we will continue to evaluate our estimated asbestos-related liability and corresponding estimated insurance reimbursement as well as the underlying assumptions and process used to derive these amounts. These uncertainties may result in our incurring future charges or increases to income to adjust the carrying value of recorded liabilities and assets, particularly if the number of claims and settlement and defense costs change significantly, or if there are significant developments in the trend of case law or court procedures, or if legislation or another alternative solution is implemented. Although the resolution of these claims will likely take many years, the effect on the results of operations, financial position and cash flow in any given period from a revision to these estimates could be material.

Other Contingencies

Environmental Matters

For environmental matters, we record a liability for estimated remediation costs when it is probable that we will be responsible for such costs and they can be reasonably estimated. Generally, third party specialists assist in the estimation of remediation costs. The environmental remediation liability as of December 31, 2021 is substantially related to the former manufacturing site in Goodyear, Arizona (the "Goodyear Site") discussed below. On June 21, 2021, we completed the sale of substantially all of the property associated with what we have historically called the Goodyear Site for $8.7 million, retaining only a small parcel on which our remediation and treatment systems are located. We will continue to be responsible for all remediation costs associated with the Goodyear Site.

Goodyear Site

The Goodyear Site was operated by Unidynamics/Phoenix, Inc. ("UPI"), which became an indirect subsidiary in 1985 when we acquired UPI's parent company, UniDynamics Corporation. UPI manufactured explosive and pyrotechnic compounds, including components for critical military programs, for the U.S. government at the Goodyear Site from 1962 to 1993, under contracts with the Department of Defense and other government agencies and certain of their prime contractors. In 1990, the U.S. Environmental Protection Agency ("EPA") issued administrative orders requiring UPI to design and carry out certain remedial actions, which UPI has done. Groundwater extraction and treatment systems have been in operation at the Goodyear Site since 1994. On July 26, 2006, we entered into a consent decree with the EPA with respect to the Goodyear Site providing for, among other things, a work plan for further investigation and remediation activities (inclusive of a supplemental remediation investigation and feasibility study). During the third quarter of 2014, the EPA issued a Record of Decision ("ROD") amendment permitting, among other things, additional source area remediation resulting in us recording a charge of $49.0 million, extending the accrued costs through 2022. Following the 2014 ROD amendment, we continued our remediation activities and explored an alternative strategy to accelerate remediation of the site. During the fourth quarter of 2019, we received conceptual agreement from the EPA on our alternative remediation strategy which is expected to further reduce the contaminant plume. Accordingly, in 2019, we recorded a pre-tax charge of $18.9 million, net of reimbursements, to extend our forecast period through 2027 and reflect our revised workplan. The total estimated gross liability was $32.3 million and $39.8 million as of December 31, 2021 and 2020, respectively and as described below, a portion is reimbursable by the U.S. Government. The current portion of the total estimated liability was $7.1 million and $10.9 million as of December 31, 2021 and 2020, respectively, and represents our best estimate, in consultation with our technical advisors, of total remediation costs expected to be paid during the twelve-month period. It is not possible at this point to reasonably estimate the amount of any obligation in excess of our current accruals through the 2027 forecast period because of the aforementioned uncertainties, in particular, the continued significant changes in the Goodyear Site conditions and additional expectations of remediation activities experienced in recent years.

On July 31, 2006, we entered into a consent decree with the U.S. Department of Justice on behalf of the Department of Defense and the Department of Energy pursuant to which, among other things, the U.S. Government reimburses us for 21% of qualifying costs of investigation and remediation activities at the Goodyear Site. As of December 31, 2021 and 2020, we recorded a receivable of $7.3 million and $7.8 million, respectively, for the expected reimbursements from the U.S. Government in respect of the aggregate liability as at that date. The receivable is reduced as reimbursements and other payments from the U.S. Government are received.

Other Environmental Matters

Marion, IL Site

We have been identified as a potentially responsible party ("PRP") with respect to environmental contamination at the Crab Orchard National Wildlife Refuge Superfund Site (the "Crab Orchard Site"). The Crab Orchard Site is located near Marion, Illinois, and consists of approximately 55,000 acres. Beginning in 1941, the United States used the Crab Orchard Site for the production of ordnance and other related products for use in World War II. In 1947, about half of the Crab Orchard Site was leased to a variety of industrial tenants whose activities (which continue to this day) included manufacturing ordnance and explosives. A predecessor of us formerly leased portions of the Crab Orchard Site and conducted manufacturing operations at the Crab Orchard Site from 1952 until 1964. General Dynamics Ordnance and Tactical Systems, Inc. ("GD-OTS") is in the process of conducting a remedial investigation and feasibility study for a portion of the Crab Orchard Site (the "AUS-OU"), which includes an area where we maintained operations, pursuant to an Administrative Order on Consent. A remedial investigation report was approved in February 2015, and work on the feasibility study is underway. It is unclear when the final feasibility study will be completed, or when a final Record of Decision may be issued.

GD-OTS has asked us to participate in a voluntary, multi-party mediation exercise with respect to response costs it has incurred or will incur with respect to the AUS-OU. We and other PRPs executed a non-binding mediation agreement on March 16, 2015, and the U.S. government executed the mediation agreement on August 6, 2015. The first phase of the mediation, involving certain former munitions or ordnance storage areas, began in November 2017, but did not result in a multi-party settlement agreement. Subsequently, we entered into discussions directly with GD-OTS and reached an agreement, as of July 13, 2021, to contribute toward GD-OTS's past RI-FS costs associated with the first-phase areas for a non-material amount. We have also agreed to pay a modest percentage of future RI-FS costs and the United States' claimed past response costs relative to the first-phase areas, a sum that we expect in the aggregate to be immaterial. We understand that GD-OTS has also reached agreements-in-principle with the U.S. Government and the other participating PRPs related to the first-phase areas of concern. Negotiations between GD-OTS and the U.S. Government are underway with respect to resolution of the remaining areas of the site, including those portions of the Crab Orchard Site where our predecessor conducted manufacturing and research activities. We at present cannot predict whether these further negotiations will result in an agreement, or when any determination of the ultimate allocable shares of the various PRPs, including the U.S. Government, is likely to be completed. It is not possible at this time to reasonably estimate the total amount of any obligation for remediation of the Crab Orchard Site as a whole because the allocation among PRPs, selection of remediation alternatives, and concurrence of regulatory authorities have not yet advanced to the stage where a reasonable estimate can be made. We notified our insurers of this potential liability and have obtained defense and indemnity coverage, subject to reservations of rights, under certain of our insurance policies.

Roseland, NJ Site

The Roseland Site was operated by Resistoflex Corporation ("Resistoflex"), which became an indirect subsidiary of ours in 1985 when we acquired Resistoflex's parent company, UniDynamics Corporation. Resistoflex manufactured specialty lined pipe and fittings at the site from the 1950s until it was closed in the mid-1980s. We undertook an extensive soil remediation effort at the Roseland Site following our closure and had been monitoring the Site's condition in the years that followed. In response to changes in remediation standards, in 2014 we began to conduct further site characterization and delineation studies at the Site. We are in the late stages of our remediation activities at the Site, which include a comprehensive delineation of contaminants of concern in soil, groundwater, surface water, sediment, and indoor air testing, all in accordance with the New Jersey Department of Environmental Protection guidelines and directives.

Other Proceedings

We regularly review the status of lawsuits, claims and proceedings that have been or may be asserted against us relating to the conduct of our business, including those pertaining to product liability, patent infringement, commercial, employment, employee benefits, environmental and stockholder matters. We record a provision for a liability for such matters when it is considered probable that a liability has been incurred and the amount of the loss can be reasonably estimated. These provisions, if any, are reviewed quarterly and adjusted as additional information becomes available. If either or both of the criteria are not met, we assess whether there is at least a reasonable possibility that a loss, or additional losses, may have been incurred. If there is a reasonable possibility that a loss or additional loss may have been incurred for such matters, we disclose the estimate of the amount of loss or range of loss, disclose that the amount is immaterial, or disclose that an estimate of loss cannot be made, as applicable. We believe that as of December 31, 2021 2020 and 2019, there was no reasonable possibility that a material loss, or any additional material losses, may have been incurred for such matters, and that adequate provision has been made in our financial statements for the potential impact of all such matters.

Note 14 – Financing

Our debt as of December 31, 2021 and 2020 consisted of the following:

(in millions) December 31,		2021		2020
Commercial paper	$	—	$	27.2
364-Day Credit Agreement		—		348.5
Total short-term borrowings	$	—	$	375.7
4.45% notes due December 2023	$	299.4	$	299.1
6.55% notes due November 2036		198.5		198.4
4.20% notes due March 2048		346.3		346.2
Other deferred financing costs associated with credit facilities		(1.8)		(0.8)
Total long-term debt	$	842.4	$	842.9

Debt discounts and debt issuance costs totaled $5.7 million and $6.6 million as of December 31, 2021 and 2020, respectively, and have been netted against the aggregate principal amounts of the related debt in the components of the debt table above.

Commercial paper program - On July 28, 2021, we increased the size of the commercial paper program ("CP Program") to permit the issuance of short-term, unsecured commercial paper notes in an aggregate principal amount not to exceed $650 million at any time outstanding. We may issue short-term, unsecured commercial paper notes pursuant to the exemption from registration contained in Section 4(a)(2) of the Securities Act of 1933, as amended. Prior to this increase, the CP Program permitted us to issue commercial paper notes in an aggregate principal amount not to exceed $550 million at any time outstanding. The other terms and conditions of the CP Program remain the same. Amounts available under the CP Program may be borrowed, repaid and re-borrowed from time to time. The notes will have maturities of up to 397 days from date of issue. The notes rank at least *pari passu* with all of our other unsecured and unsubordinated indebtedness. As of December 31, 2021 and 2020, there was $0.0 million and $27.2 million of outstanding borrowings, respectively. We issued $100 million in January 2020 and $150 million in December 2019 of commercial paper to fund the acquisitions of I&S and Cummins-Allison, respectively. See discussion in Note 2, "Acquisitions" for further details.

364-Day Credit Agreement - On April 16, 2020, we entered into a new senior unsecured 364-day credit facility (the "364-Day Credit Agreement"). We borrowed term loans denominated in dollars (the "Dollar Term Loans") in an aggregate principal amount equal to $300 million, and term loans denominated in euros (the "Euro Term Loans") in an aggregate principal amount equal to €40 million under the 364-Day Credit Agreement. Interest on the Dollar Term Loans accrues at a rate per annum equal to (a) a base rate (determined in a customary manner), plus a margin dependent upon ratings of our senior unsecured long-term debt (the "Index Debt Rating") or (2) an adjusted LIBO rate (determined in a customary manner) for an interest period to be selected by us, plus a margin dependent upon the Index Debt Rating. Interest on the Euro Term Loans accrues at an adjusted LIBO rate (determined in a customary manner) for an interest period to be selected by us, plus a margin. The 364- Day Credit Agreement contains customary affirmative and negative covenants and customary events of default and acceleration for credit facilities of this type. As of December 31, 2020, there was $348.5 million outstanding under the 364-Day Credit Agreement. On April 15, 2021, we repaid the amount outstanding under the 364-Day Credit Agreement with cash on hand and the issuance of commercial paper.

4.45% notes due December 2023 - In December 2013, we issued 10 year notes having an aggregate principal amount of $300 million. The notes are unsecured, senior obligations that mature on December 15, 2023 and bear interest at 4.45% per annum, payable semi-annually on June 15 and December 15 of each year. The notes have no sinking fund requirement, but may be redeemed, in whole or part, at our option. These notes do not contain any material debt covenants or cross default provisions. If there is a change in control of the Company, and if as a consequence, the notes are rated below investment grade by both Moody's Investors Service and Standard & Poor's, then holders of the notes may require us to repurchase them, in whole or in part, for 101% of the principal amount plus accrued and unpaid interest. Debt issuance costs are deferred and included in long-term debt and are amortized as a component of interest expense over the term of the notes. Including debt issuance cost amortization, these notes have an effective annualized interest rate of 4.56%. The notes were issued under an indenture dated as of December 13, 2013. The indentures contain certain restrictions, including a limitation that restricts our ability and the ability of certain of our subsidiaries to create or incur secured indebtedness, enter into certain sale and leaseback transactions, and consolidate, merge or transfer all or substantially all of our assets and the assets of our subsidiaries.

6.55% notes due November 2036 - In November 2006, we issued 30 year notes having an aggregate principal amount of $200 million. The notes are unsecured, senior obligations of us that mature on November 15, 2036 and bear interest at 6.55% per annum, payable semi-annually on May 15 and November 15 of each year. The notes have no sinking fund requirement, but may be redeemed, in whole or in part, at the option of us. These notes do not contain any material debt covenants or cross default provisions. If there is a change in control of the Company, and if as a consequence, the notes are rated below investment grade by both Moody's Investors Service and Standard & Poor's, then holders of the notes may require us to repurchase them, in whole or in part, for 101% of the principal amount plus accrued and unpaid interest. Debt issuance costs are deferred and included in long-term debt and are amortized as a component of interest expense over the term of the notes. Including debt issuance cost amortization, these notes have an effective annualized interest rate of 6.67%. The notes were issued under an indenture dated as of April 1, 1991. The indentures contain certain restrictions, including a limitation that restricts our ability and the ability of certain of our subsidiaries to create or incur secured indebtedness, enter into certain sale and leaseback transactions, and consolidate, merge or transfer all or substantially all of our assets and the assets of our subsidiaries.

4.20% notes due March 2048 - On February 5, 2018, we completed a public offering of $350 million aggregate principal amount of 4.20% Senior Notes due 2048 (the "2048 Notes"). The 2048 Notes bear interest at a rate of 4.20% per annum and mature on March 15, 2048. Interest on the 2048 Notes is payable on March 15 and September 15 of each year, commencing on September 15, 2018. These notes do not contain any material debt covenants or cross default provisions. If there is a change in control of the Company, and if as a consequence, the notes are rated below investment grade by both Moody's Investors Service and Standard & Poor's, then holders of the notes may require us to repurchase them, in whole or in part, for 101% of the principal amount plus accrued and unpaid interest. Debt issuance costs are deferred and included in long-term debt and are amortized as a component of interest expense over the term of the notes. Including debt issuance cost amortization, these notes have an effective annualized interest rate of 4.29%. The notes were issued under an indenture dated as of February 5, 2018. The indentures contain certain restrictions, including a limitation that restricts our ability and the ability of certain of our subsidiaries to create or incur secured indebtedness, enter into certain sale and leaseback transactions, and consolidate, merge or transfer all or substantially all of our assets and the assets of our subsidiaries.

Other - As of December 31, 2021, we had open standby letters of credit of $49.5 million issued pursuant to a $162.7 million uncommitted Letter of Credit Reimbursement Agreement, and certain other credit lines. As of December 31, 2020, we had open standby letters of credit of $57.9 million issued pursuant to a $183.4 million uncommitted Letter of Credit Reimbursement Agreement, and certain other credit lines.

Revolving Credit Facility - On July 28, 2021, we entered into a $650 million, 5-year Revolving Credit Agreement (the "2021 Facility"), which replaced the $550 million revolving credit facility that we had entered into in December 2017. The 2021 Facility allows us to borrow, repay, or to the extent permitted by the agreement, prepay and re-borrow funds at any time prior to the stated maturity date. Interest on loans made under the 2021 Facility accrues, at our option, at a rate per annum equal to (1) a base rate, plus a margin ranging from 0.00% to 0.50% depending upon the ratings by S&P and Moody's of our senior unsecured long-term debt (the "Index Debt Rating"), or (2) an adjusted LIBO rate or the applicable replacement rate (determined based on "hardwired" LIBOR transition provisions consistent with those published by the Alternative References Rates Committee) for an interest period to be selected by us, plus a margin ranging from 0.805% to 1.50% depending upon the Index Debt Rating. The 2021 Facility contains customary affirmative and negative covenants for credit facilities of this type, including limitations on us and our subsidiaries with respect to indebtedness, liens, mergers, consolidations, liquidations and dissolutions, sales of all or substantially all assets, transactions with affiliates and hedging arrangements. We must also maintain a debt to capitalization ratio not to exceed 0.65 to 1.00 at all times. The 2021 Facility also provides for customary events of default, including failure to pay principal, interest or fees when due, failure to comply with covenants, any representation or warranty made by us or any of our material subsidiaries being false in any material respect, default under certain other material indebtedness, certain insolvency or receivership events affecting us and our material subsidiaries, certain ERISA events, material judgments and a change in control of us. The undrawn portion of this revolving credit agreement is also available to serve as a backstop facility for the issuance of commercial paper. As of December 31, 2021 and 2020, there were no outstanding borrowings.

As of December 31, 2021, our total debt to total capitalization ratio was 31.5%, computed as follows:

(in millions)	
Total long-term debt	$ 842.4
Total shareholders' equity	1,832.3
Capitalization	$ 2,674.7
Total indebtedness to capitalization	31.5 %

Note 15 - Fair Value Measurements

Accounting standards define fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value measurements are to be considered from the perspective of a market participant that holds the asset or owes the liability. The standards also establish a fair value hierarchy which requires an entity to maximize the use of observable inputs and minimize the use of unobservable inputs when measuring fair value.

The standards describe three levels of inputs that may be used to measure fair value:

Level 1**:** Quoted prices in active markets for identical or similar assets and liabilities.

Level 2**:** Quoted prices for identical or similar assets and liabilities in markets that are not active or observable inputs other than quoted prices in active markets for identical or similar assets and liabilities. Level 2 assets and liabilities include over-the-counter derivatives, principally forward foreign exchange contracts, whose value is determined using pricing models with inputs that are generally based on published foreign exchange rates and exchange traded prices, adjusted for other specific inputs that are primarily observable in the market or can be derived principally from or corroborated by observable market data.

Level 3**:** Unobservable inputs that are supported by little or no market activity and that are significant to the fair value of the assets or liabilities.

Valuation Technique

The carrying value of our financial assets and liabilities, including cash and cash equivalents, accounts receivable, commercial paper and accounts payable approximate fair value, without being discounted, due to the short periods during which these amounts are outstanding.

We are exposed to certain risks related to our ongoing business operations, including market risks related to fluctuation in currency exchange. We use foreign exchange contracts to manage the risk of certain cross-currency business relationships to minimize the impact of currency exchange fluctuations on our earnings and cash flows. We do not hold or issue derivative financial instruments for trading or speculative purposes. Foreign exchange contracts not designated as hedging instruments had a notional value of $3.0 million and $34.2 million as of December 31, 2021 and 2020, respectively. Our derivative assets and liabilities include foreign exchange contract derivatives that are measured at fair value using internal models based on observable market inputs such as forward rates and interest rates. Based on these inputs, the derivatives are classified within Level 2 of the valuation hierarchy. Such derivative receivable amounts are recorded within “Other current assets” on our Consolidated Balance Sheets and were $0.0 million and less than $0.1 million as of the years ended December 31, 2020 and 2019, respectively. Such derivative liability amounts are recorded within “Accrued liabilities” on our Consolidated Balance Sheets and were less than $0.1 million and $0.1 million for the years ended December 31, 2021 and 2020, respectively.

Available-for-sale securities consist of marketable debt securities and rabbi trusts investments. Marketable debt securities consist of commercial paper which are measured at fair value using prices for comparable securities in active markets, and are therefore classified within Level 2 of the valuation hierarchy. The fair value of the commercial paper was $30.0 million as of December 31, 2020. These investments are included in “Other current assets” on our Consolidated Balance Sheets. We also have two rabbi trusts that hold marketable securities for the benefit of participants in the SERP. These investments are measured at fair value using quoted market prices in an active market, and are therefore classified within Level 1 of the valuation hierarchy. The fair value of available-for-sale securities was $1.6 million and $1.5 million as of December 31, 2021 and 2020, respectively. These investments are included in “Other assets” on our Consolidated Balance Sheets.

Long-term debt rates currently available to us for debt with similar terms and remaining maturities are used to estimate the fair value for debt issues that are not quoted on an exchange. The estimated fair value of long-term debt is measured using Level 2 inputs and was $984.9 million and $954.8 million as of December 31, 2021 and 2020, respectively.

Note 16 – Restructuring

Overview

2020 Repositioning - In the second quarter of 2020, we initiated actions in response to the adverse economic impact of COVID-19 and integration actions related to the Cummins-Allison acquisition. These actions include workforce reductions of approximately 1,200 employees, or about 11% of our global workforce, and the exiting of two leased office facilities and one leased warehouse facility. We do not expect to incur additional restructuring charges.

2019 Repositioning - In the fourth quarter of 2019, we initiated actions to consolidate two manufacturing operations in Europe within our Process Flow Technologies segment. In 2020, we recorded additional severance costs related to the final negotiation with the works council/union at both locations. These actions, taken together, included workforce reductions of approximately 180 employees, or less than 1% of our global workforce. We expect to complete the program in the fourth quarter of 2023.

2017 Repositioning - In the fourth quarter of 2017, we initiated broad-based repositioning actions designed to improve profitability. These actions included headcount reductions of approximately 300 employees, or about 3% of our global workforce, and select facility consolidations in North America and Europe. In 2020, we adjusted the estimate downward to reflect the impact of employees that chose to voluntarily terminate prior to receiving severance at the conclusion of the actions in North America. In 2021, we recorded a gain on sale of real estate related to these actions. We expect to complete the program in the first quarter of 2022.

Acquisition-Related Restructuring - In the third quarter of 2018, we initiated actions within our Payment & Merchandising Technologies segment related to the closure of Crane Currency's printing operations in Sweden, which were transitioned to a new print facility in Malta. These actions included workforce reductions of approximately 170 employees, or less than 2% of our global workforce. We do not expect to incur additional restructuring charges.

Other Restructuring - In the second quarter of 2020, we recorded other restructuring costs within our Payment & Merchandising Technologies segment. We do not expect to incur additional restructuring charges.

Restructuring (Gains) Charges, Net

We recorded restructuring (gains) charges which are reflected in the Consolidated Statements of Operations, as follows:

(in millions) For the year ended December 31,	2021	2020	2019
Aerospace & Electronics	$ —	$ 6.5	$ (0.4)
Process Flow Technologies	(13.2)	6.1	10.5
Payment & Merchandising Technologies	(3.7)	19.1	7.4
Total restructuring (gains) charges, net	$ (16.9)	$ 31.7	$ 17.5

The following table summarizes our restructuring (gains) charges by program, cost type and segment for the years ended December 31, 2021, 2020 and 2019:

	December 31, 2021			December 31, 2020			December 31, 2019		
(in millions)	Severance	Other	Total	Severance	Other	Total	Severance	Other	Total
Aerospace & Electronics	$ —	$ —	$ —	$ 6.5	$ —	$ 6.5	$ —	$ —	$ —
Process Flow Technologies	(0.1) [a]	—	(0.1)	3.8	—	3.8	—	—	—
Payment & Merchandising Technologies	(0.8) [a]	(2.8)	(3.6)	16.6	4.6 [b]	21.2	—	—	—
2020 Repositioning	(0.9) [a]	(2.8)	(3.7)	26.9	4.6	31.5	—	—	—
Process Flow Technologies	0.1	—	0.1	6.1 [a]	—	6.1	9.9	—	9.9
2019 Repositioning	0.1	—	0.1	6.1	—	6.1	9.9	—	9.9
Aerospace & Electronics	—	—	—	—	—	—	—	(0.4)	(0.4)
Process Flow Technologies	(0.4) [a]	(12.7) [c]	(13.1)	(3.8) [a]	—	(3.8)	0.6	—	0.6
Payment & Merchandising Technologies	(0.2) [a]	—	(0.2)	(0.9) [a]	(1.5) [d]	(2.4)	0.3	1.8	2.1
2017 Repositioning	(0.6) [a]	(12.7) [c]	(13.3)	(4.7) [a]	(1.5) [d]	(6.2)	0.9	1.4	2.3
Payment & Merchandising Technologies	—	—	—	—	—	—	1.7	3.6	5.3
Acquisition-Related Restructuring	—	—	—	—	—	—	1.7	3.6	5.3
Payment & Merchandising Technologies	—	—	—	0.3	—	0.3	—	—	—
Other Restructuring	—	—	—	0.3	—	0.3	—	—	—
Total	$ (1.4)	$ (15.5)	$ (16.9)	$ 28.6	$ 3.1	$ 31.7	$ 12.5	$ 5.0	$ 17.5

(a) Reflects changes in estimates for increases and decreases in costs related to our restructuring programs.

(b) Primarily reflects non-cash charges related to the impairment of ROU assets and leasehold improvements associated with the exit of the three leased facilities in 2020.

(c) Reflects a pre-tax gain related to the sale of real estate in 2021

(d) Reflects a pre-tax gain related to the sale of a facility in 2020.

The following table summarizes the cumulative restructuring costs incurred through December 31, 2021. We do not expect to incur additional facility consolidation costs to complete these actions as of December 31, 2021:

	Cumulative Restructuring Costs		
(in millions)	Severance	Other	Total
Aerospace & Electronics	$ 6.5	$ —	$ 6.5
Process Flow Technologies	3.7	—	3.7
Payment & Merchandising Technologies	15.8	1.8	17.6
2020 Repositioning	26.0	1.8	27.8
Process Flow Technologies	16.1	—	16.1
2019 Repositioning	16.1	—	16.1
Aerospace & Electronics	1.3	(1.4)	(0.1)
Process Flow Technologies	13.1	(12.7)	0.4
Payment & Merchandising Technologies	11.5	0.7	12.2
2017 Repositioning	$ 25.9	$ (13.4)	$ 12.5

Restructuring Liability

The following table summarizes the accrual balances related to these restructuring charges by program:

(in millions)	2020 Repositioning	2019 Repositioning	2017 Repositioning	Other Restructuring	Total
Severance:					
Balance at December 31, 2019	$ —	$ 9.9	$ 12.5	$ —	$ 22.4
Expense [(a)]	26.9	—	—	0.3	27.2
Adjustments [(b)]	—	6.1	(4.7)	—	1.4
Utilization	(22.7)	—	(3.1)	(0.3)	(26.1)
Balance at December 31, 2020 [(c)]	$ 4.2	$ 16.0	$ 4.7	$ —	$ 24.9
Expense [(a)]	—	0.1	—	—	0.1
Adjustments [(b)]	(0.9)	—	(0.5)	—	(1.4)
Utilization	(3.3)	(4.6)	(3.5)	—	(11.4)
Balance at December 31, 2021 [(c)]	$ —	$ 11.5	$ 0.7	$ —	$ 12.2

(a) Included within "Restructuring (gains) charges, net" in the Consolidated Statements of Operations

(b) Included within "Restructuring (gains) charges, net" in the Consolidated Statements of Operations and reflects changes in estimates for increases and decreases in costs related to our restructuring programs

(c) Included within Accrued Liabilities in the Consolidated Balance Sheets

Note 17 – Quarterly Results (Unaudited)

(in millions, except per share data) For year ended December 31,	First Quarter	Second Quarter	Third Quarter	Fourth Quarter	Full Year
2021					
Net sales	$ 779.6	$ 796.4	$ 833.5	$ 770.5	$ 3,180.0
Cost of sales	470.5	476.8	509.1	482.5	1,939.0
Gross profit	309.0	319.6	324.4	288.0	1,241.0
Operating profit	140.1	136.9	138.2	87.1	502.3
Net income from continuing operations attributable to common shareholders	103.4	110.7	111.4	68.8	394.3
Income from discontinued operations, net of tax	5.0	27.6	5.2	3.3	41.1
Net income attributable to common shareholders	108.4	138.3	116.6	72.1	435.4
Earnings per basic share:					
Earnings per basic share from continuing operations	$ 1.78	$ 1.89	$ 1.90	$ 1.19	$ 6.76
Earnings per basic share from discontinued operations	0.08	0.47	0.09	0.06	0.70
Earnings per basic share	$ 1.86	$ 2.36	$ 1.99	$ 1.25	$ 7.46
Earnings per diluted share:					
Earnings per diluted share from continuing operations	$ 1.76	$ 1.87	$ 1.87	$ 1.16	$ 6.66
Earnings per diluted share from discontinued operations	0.08	0.46	0.09	0.06	0.70
Earnings per diluted share	$ 1.84	$ 2.33	$ 1.96	$ 1.22	$ 7.36
2020					
Net sales	$ 746.9	$ 644.3	$ 686.5	$ 683.6	$ 2,761.3
Cost of sales	471.9	424.8	443.3	456.2	1,796.2
Gross profit	275.0	219.5	243.2	227.4	965.1
Operating profit	81.7	28.7	75.9	53.9	240.2
Net income from continuing operations attributable to common shareholders	57.7	13.4	49.4	42.6	163.1
Income from discontinued operations, net of tax	5.0	1.4	7.2	4.3	17.9
Net income attributable to common shareholders	62.7	14.8	56.6	46.9	181.0
Earnings per basic share:					
Earnings per basic share from continuing operations	$ 0.98	$ 0.23	$ 0.85	$ 0.73	$ 2.79
Earnings per basic share from discontinued operations	0.09	0.03	0.12	0.07	0.31
Earnings per basic share	$ 1.07	$ 0.26	$ 0.97	$ 0.80	$ 3.10
Earnings per diluted share:					
Earnings per diluted share from continuing operations	$ 0.96	$ 0.23	$ 0.84	$ 0.73	$ 2.77
Earnings per diluted share from discontinued operations	0.09	0.02	0.13	0.07	0.31
Earnings per diluted share	$ 1.05	$ 0.25	$ 0.97	$ 0.80	$ 3.08

Item 9. Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

None

Item 9A. Controls and Procedures

Evaluation of Disclosure Controls and Procedures. The Company's Chief Executive Officer and Principal Financial Officer evaluated the effectiveness of the design and operation of the Company's disclosure controls and procedures as of the end of the year covered by this annual report. The Company's disclosure controls and procedures are designed to ensure that information required to be disclosed by the Company in the reports that are filed or submitted under the Securities Exchange Act of 1934 is recorded, processed, summarized, and reported within the time periods specified in the SEC rules and forms and the information is accumulated and communicated to the Company's Chief Executive Officer and Principal Financial Officer to allow timely decisions regarding required disclosure. Based on this evaluation, the Company's Chief Executive Officer and Principal Financial Officer have concluded that these controls are effective as of the end of the year covered by this annual report.

Change in Internal Controls over Financial Reporting. During the fourth quarter ended December 31, 2021, there have been no changes in the Company's internal control over financial reporting, identified in connection with our evaluation thereof, that have materially affected, or are reasonably likely to materially affect, its internal control over financial reporting.

Design and Evaluation of Internal Control over Financial Reporting. Pursuant to Section 404 of the Sarbanes-Oxley Act of 2002, we included a report of our management's assessment of the design and effectiveness of our internal controls as part of this Annual Report on Form 10-K for the year ended December 31, 2021. Our independent registered public accounting firm also attested to, and reported on, our management's assessment of the effectiveness of internal control over financial reporting. Our management's report and our independent registered public accounting firm's attestation report are set forth in Item 8 of this Annual Report on Form 10-K under the captions entitled "Management's Responsibility for Financial Reporting" and "Report of Independent Registered Public Accounting Firm."

REPORT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

To the Shareholders and the Board of Directors of Crane Co.

Opinion on Internal Control over Financial Reporting

We have audited the internal control over financial reporting of Crane Co. and subsidiaries (the "Company") as of December 31, 2021, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO). In our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2021, based on criteria established in *Internal Control — Integrated Framework (2013)* issued by COSO.

We have also audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States) (PCAOB), the consolidated financial statements as of and for the year ended December 31, 2021, of the Company and our report dated February 28, 2022, expressed an unqualified opinion on those consolidated financial statements.

Basis for Opinion

The Company's management is responsible for maintaining effective internal control over financial reporting and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying "Management's Responsibility for Financial Reporting" appearing in Item 8. Our responsibility is to express an opinion on the Company's internal control over financial reporting based on our audit. We are a public accounting firm registered with the PCAOB and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audit in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether effective internal control over financial reporting was maintained in all material respects. Our audit included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, testing and evaluating the design and operating effectiveness of internal control based on the assessed risk, and performing such other procedures as we considered necessary in the circumstances. We believe that our audit provides a reasonable basis for our opinion.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

/s/ Deloitte & Touche LLP
Stamford, Connecticut
February 28, 2022

Item 9B. Other Information

None

Item 9C. Disclosure Regarding Foreign Jurisdictions That Prevent Inspections

Not Applicable.

Part III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by Item 10 is incorporated by reference to the definitive proxy statement with respect to the 2022 Annual Meeting of Shareholders which the Company expects to file with the Commission pursuant to Regulation l4A on or about March 11, 2022 except that such information with respect to Executive Officers of the Registrant is included, pursuant to Instruction 3, paragraph (b) of Item 401 of Regulation S-K, under Part I. The Company's Corporate Governance Guidelines, the charters of its Management Organization and Compensation Committee, its Nominating and Governance Committee and its Audit Committee and its Code of Ethics are available at www.craneco.com/governance. The information on our website is not part of this report.

Item 11. Executive Compensation

The information required by Item 11 is incorporated by reference to the definitive proxy statement with respect to the 2022 Annual Meeting of Shareholders which the Company expects to file with the Commission pursuant to Regulation 14A on or about March 11, 2022.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Except the information required by Section 201(d) of Regulation S-K which is set forth below, the information required by Item 12 is incorporated by reference to the definitive proxy statement with respect to the 2022 Annual Meeting of Shareholders which the Company expects to file with the Commission pursuant to Regulation 14A on or about March 11, 2022.

As of December 31, 2021:	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted average exercise price of outstanding options	Number of securities remaining available for future issuance under equity compensation plans
	(a)	(b)	(c)
Equity compensation plans approved by security holders:			
2018 Stock Incentive Plan (and predecessor plans)	2,952,781 [a]	$ 74.82	—
2018 Amended and Restated Stock Incentive Plan	24,060	—	4,734,667
Equity compensation plans not approved by security holders	—	—	—
Total	2,976,841	$ 74.82	4,734,667

[a] Includes 372,615 restricted share units ("RSUs"), 118,036 deferred stock units ("DSUs") and 419,854 performance-based restricted share units ("PRSUs"), assuming the maximum potential payout percentage. Actual numbers of shares may vary, depending on actual performance. If the PRSUs included in this total vest at the target performance level as opposed to the maximum level, the aggregate awards outstanding would be 2,742,854. Column (b) does not take RSUs, PRSUs or DSUs into account because they do not have an exercise price.

Item 13. Certain Relationships and Related Transactions, and Director Independence

The information required by Item 13 is incorporated by reference to the definitive proxy statement with respect to the 2022 Annual Meeting of Shareholders which the Company expects to file with the Commission pursuant to Regulation 14A on or about March 11, 2022.

Item 14. Principal Accounting Fees and Services

The information required by Item 14 is incorporated by reference to the definitive proxy statement with respect to the 2022 Annual Meeting of Shareholders which the Company expects to file with the Commission pursuant to Regulation 14A on or about March 11, 2022.

Item 15. Exhibits and Financial Statement Schedules

(a) Consolidated Financial Statements:

(b) Exhibits

Exhibit No.	Description
Exhibit 21	Subsidiaries of the Registrant.
Exhibit 23.1	Consent of Independent Registered Public Accounting Firm.
Exhibit 31.1	Certification of Chief Executive Officer pursuant to Rule 13a-14(a) or 15d-14(a).
Exhibit 31.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(a) or 15d-14(a).
Exhibit 32.1	Certification of Chief Executive Officer pursuant to Rule13a-14(b) or 15d-14(b).
Exhibit 32.2	Certification of Principal Financial Officer pursuant to Rule 13a-14(b) or 15d-14(b).
Exhibit 101.INS	XBRL Instance Document
Exhibit 101.SCH	XBRL Taxonomy Extension Schema Document
Exhibit 101.CAL	XBRL Taxonomy Calculation Linkbase Document
Exhibit 101.DEF	XBRL Taxonomy Extension Definition Linkbase Document
Exhibit 101.LAB	XBRL Taxonomy Label Linkbase Document
Exhibit 101.PRE	XBRL Taxonomy Presentation Linkbase Document
Exhibit 104	Cover Page Interactive Data File (formatted in Inline XBRL and contained in Exhibit 101)

Exhibits to Form 10-K — Documents incorporated by reference:

(2)	Instruments Defining the Rights of Security Holders:
2.1	Agreement and Plan of Merger, dated as of December 5, 2017, by and among the Company, FC Development Corp., Crane & Co., Inc and, solely in its capacity as the Company Equityholder Representative, Shareholder Representative Services LLC (incorporated by reference to Exhibit 2.1 to Form 8-K filed on December 5, 2017).
(3)	Certificate of Incorporation and Bylaws:
(3)(a)	The Company's Amended and Restated Certificate of Incorporation (incorporated by reference to Exhibit 3.1 to the Company's Current Report on Form 8-K filed on April 25, 2017).
3 (b)	By-laws of the Company, as amended through April 24, 2017 (incorporated by reference to Exhibit 3.2 to the Company's Current Report on Form 8-K filed on April 25, 2017).
(4)	Instruments Defining the Rights of Security Holders:
(4)(a)	Indenture dated as of April 1, 1991 between the Registrant and the Bank of New York (incorporated by reference to Exhibit 4.2 to the Company's Annual Report on Form 10-K for the year ended December 31, 2005).
(4)(b)(1)	Indenture, dated as of December 13, 2013, between the Company and The Bank of New York Mellon, as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed on December 13, 2013).
(4)(b)(2)	Form of Note for 4.450% Notes due 2023 (incorporated by reference to Exhibit 4.3 to the Company's Current Report on Form 8-K filed on December 13, 2013).
(4)(c)(1)	Indenture, dated as of dated as of February 5, 2018, between the Company and U.S. Bank National Association, as trustee (incorporated by reference to Exhibit 4.1 to the Company's Current Report on Form 8-K filed on February 5, 2018).
(4)(c)(2)	Form of Note for 4.200% Senior Notes due 2048 (incorporated by reference to Exhibit 4.2 to the Company's Current Report on Form 8-K filed on February 5, 2018).
(4)(d)	Description of Registrant's Securities Registered Pursuant to Section 12 of the Exchange Act (incorporated by reference to Exhibit 4.1 to the Company's Annual Report on Form 10-K for the year ended December 31, 2019).
(10)	
10(a)	Form of Commercial Paper dealer Agreement executed between Crane Co, as issuer and the Dealer party there to (incorporated by reference to Exhibit 10.1 to the Company's Current Report on Form 8-K filed on March 3, 2015).
10(b)	$650 million 5-Year Revolving Credit Agreement, dated as of July 28, 2021 (incorporated by reference to the Registrant's Current Report on Form 8-K filed on July 28, 2021).
(iii)	Compensatory Plans
(a)	The 2011 Annual Incentive Plan (incorporated by reference to Appendix A to the Company's Proxy Statement filed on March 9, 2011).
(b)	The Crane Co. 2013 Stock Incentive Plan (incorporated by reference to Appendix A to the Company's Proxy Statement filed on March 11, 2013).
(c)	The Crane Co. 2018 Stock Incentive Plan (incorporated by reference to Appendix A to the Company's Proxy Statement filed on March 15, 2018).
(d)	The Crane Co. Amended & Restated 2018 Stock Incentive Plan (incorporated by reference to Exhibit 10.1 to the Registrant's Current Report on Form 8-K filed on April 26, 2001).
(e)	2007 Non-Employee Director Compensation Plan (incorporated by reference to Appendix B to the Company's Proxy Statement filed on March 9, 2007).
(f)	The Crane Co. 2009 Non-Employee Director Compensation Plan (incorporated by reference to Appendix B to the Company's Proxy Statement filed on March 6, 2009).
(g)	The Crane Co. Benefit Equalization Plan, effective February 25, 2008 (incorporated by reference to Exhibit 10.1 to the Company's Quarterly Report on Form 10-Q for the quarter ended March 31, 2008).
(h)	The Crane Co. Benefit Equalization Plan as amended effective January 1, 2013 (incorporated by reference to Exhibit 10.1 to the Company's Form 8-K filed December 11, 2013).
(i)	Form of Employment/Severance Agreement between the Company and certain executive officers, which provides for the continuation of certain employee benefits upon a change in control (incorporated by reference to Exhibit 10.2 to the Company's Annual Report on Form 10-K for the year ended December 31, 2010). Agreements in this form have been entered into with all executive officers.
(j)	Form of Indemnification Agreement between the Company and each of its director and executive officers (incorporated by reference to Exhibit 10.3(i) to the Company's Annual Report on Form 10-K filed February 23, 2021).
(k)	Time-sharing Agreement dated January 31, 2014 between the Company and Max H. Mitchell (incorporated by reference to Exhibit 10.1 to the Company's Form 8-K filed on January 31, 2014).
(l)	Amendment, dated August 31, 2017, to Time Sharing Agreement with M. Mitchell (incorporated by reference to Exhibit 10.2 to the Company's Quarterly Report on Form 10-Q for the quarter ended September 30, 2017).
(m)	Time-sharing Agreement, dated April 27, 2020 between the Company and James L.L. Tullis (incorporated by reference to Exhibit 10.3(l) to the Company's Annual Report on Form 10-K filed February 23, 2021).

Item 16. Form 10-K Summary

Not applicable.

Part IV

Signatures

Pursuant to the requirements of Section l3 or l5 (d) of the Securities Exchange Act of l934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

CRANE CO.
(Registrant)

By /s/ MAX H. MITCHELL
Max H. Mitchell
President and Chief Executive Officer
Date 2/28/2022

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.

Officers

/s/ MAX H. MITCHELL	/s/ RICHARD A. MAUE	/s/ CHRISTINA CRISTIANO
Max H. Mitchell President, Chief Executive Officer and Director	Richard A. Maue Senior Vice President Chief Financial Officer (Principal Financial Officer)	Christina Cristiano Vice President, Controller Chief Accounting Officer (Principal Accounting Officer)
Date 2/28/2022	Date 2/28/2022	Date 2/28/2022

Directors

/s/ JAMES L.L. TULLIS	/s/ MARTIN R. BENANTE	/s/ DONALD G. COOK
James L.L. Tullis	Martin R. Benante	Donald G. Cook
Date 2/28/2022	Date 2/28/2022	Date 2/28/2022
/s/ MICHAEL DINKINS	/s/ RONALD C. LINDSAY	/s/ ELLEN MCCLAIN
Michael Dinkins	Ronald C. Lindsay	Ellen McClain
Date 2/28/2022	Date 2/28/2022	Date 2/28/2022
/s/ CHARLES G. MCCLURE, JR.	/s/ JENNIFER M. POLLINO	/s/ JOHN S. STROUP
Charles G. McClure, Jr.	Jennifer M. Pollino	John S. Stroup
Date 2/28/2022	Date 2/28/2022	Date 2/28/2022

SHAREHOLDER INFORMATION

CRANE CO. INTERNET SITE
Copies of Crane Co.'s report on Form 10-K for 2021 as filed with the Securities and Exchange Commission as well as other financial reports and news from Crane Co. may be read and downloaded at www.craneco.com.

ANNUAL MEETING
The Crane Co. annual meeting of shareholders will be held virtually online via live webcast at 10:00 a.m. Eastern Daylight Time, on Monday, May 16, 2022 at www.meetnow.global/MXUNZN9.

STOCK LISTING
Crane Co. common stock is traded on the New York Stock Exchange under the symbol CR.

AUDITORS
Deloitte & Touche LLP
695 East Main Street
Stamford, CT 06901

EQUAL EMPLOYMENT OPPORTUNITY POLICY
Crane Co. is an equal opportunity employer. It is the policy of the Company to recruit, hire, promote and transfer to all job classifications without regard to race, color, religion, national origin or ancestry, age, sex, pregnancy, marital status, sexual orientation or gender identity, physical or mental disability, military status, veteran status, or any other characteristics protected by law in all aspects of the employment process and relationship.

ENVIRONMENT, HEALTH AND SAFETY POLICY
Crane Co. is committed to protecting the environment by taking responsibility to prevent serious or irreversible environmental degradation through efficient operations and activities. Crane Co. recognizes environmental management among its highest priorities throughout the Company, and has established policies and programs that are integral and essential elements of the business plan of each of the business units.

STOCK TRANSFER AGENT AND REGISTRAR
For customer service, changes of address, transfer of stock certificates, and general correspondence:

Computershare Trust Company, N.A.
P.O. Box 505000
Louisville, KY 40233-5000
+1 (781) 575-2725
Toll free: +1 (877) 373-6374
www.computershare.com/investor

Private Couriers/Registered Mail:
Computershare Trust Company, N.A.
462 South 4th Street
Suite 1600
Louisville, KY 40202

BOND TRUSTEE AND PAYING AGENT
U.S. Bank Global Corporate Trust
CityPlace I
185 Asylum Street, 27th Floor
Hartford, CT 06103
Toll free: +1 (800) 934-6802
www.usbank.com

DIVIDEND REINVESTMENT AND STOCK PURCHASE PLAN
Crane Co. has authorized Computershare Trust Company, N.A. to offer the Computershare Investment Plan, a dividend reinvestment and stock purchase plan for Crane Co. shareholders. The plan brochure provides a detailed explanation and is available by calling +1 (781) 575-2725 or +1 (877) 373-6374 (toll free), online at www.computershare.com/investor or by writing to:

Computershare CIP
c/o Computershare Trust Company, N.A.
P.O. Box 505000
Louisville, KY 40233-5000

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CRANE

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