

FERRO CORP  
Form 10-Q  
November 08, 2018  
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UNITED STATES

SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-Q

(Mark One)

QUARTERLY REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

For the quarterly period ended September 30, 2018

or

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 1-584

FERRO CORPORATION

(Exact name of registrant as specified in its charter)

Ohio 34-0217820  
(State or other jurisdiction of (I.R.S. Employer Identification No.)  
incorporation or organization)

6060 Parkland Boulevard 44124  
Suite 250 (Zip Code)

Mayfield Heights, OH  
(Address of principal executive offices)

216-875-5600  
(Registrant's telephone number, including area code)

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

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

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

If an emerging growth company, indicate by checkmark 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 is a shell company (as defined in Rule 12b-2 of the Act). YES    NO

At October 31, 2018, there were 83,262,093 shares of Ferro Common Stock, par value \$1.00, outstanding.

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## PART I — FINANCIAL INFORMATION

## Item 1. Financial Statements (Unaudited)

## Ferro Corporation and Subsidiaries

## Condensed Consolidated Statements of Operations

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(Dollars in thousands, except per share amounts)			
Net sales	\$ 395,163	\$ 350,012	\$ 1,216,934	\$ 1,019,199
Cost of sales	289,676	246,396	866,116	708,447
Gross profit	105,487	103,616	350,818	310,752
Selling, general and administrative expenses	64,344	65,941	207,560	188,368
Restructuring and impairment charges	2,561	1,471	10,435	7,713
Other expense (income):				
Interest expense	8,553	7,248	24,715	19,921
Interest earned	(110)	(201)	(497)	(556)
Foreign currency losses, net	2,554	1,021	7,054	5,575
Loss on extinguishment of debt	—	—	3,226	3,905
Miscellaneous expense (income), net	74	(2,182)	(523)	(3,675)
Income before income taxes	27,511	30,318	98,848	89,501
Income tax expense	11,368	7,353	29,246	23,186
Net income	16,143	22,965	69,602	66,315
Less: Net income attributable to noncontrolling interests	85	148	485	575
Net income attributable to Ferro Corporation common shareholders	\$ 16,058	\$ 22,817	\$ 69,117	\$ 65,740
Earnings per share attributable to Ferro Corporation common shareholders:				
Basic earnings per share	\$ 0.19	\$ 0.27	\$ 0.82	\$ 0.79
Diluted earnings per share	\$ 0.19	\$ 0.27	\$ 0.81	\$ 0.77

See accompanying notes to condensed consolidated financial statements.

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## Ferro Corporation and Subsidiaries

## Condensed Consolidated Statements of Comprehensive Income

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(Dollars in thousands)			
Net income	\$ 16,143	\$ 22,965	\$ 69,602	\$ 66,315
Other comprehensive income, net of income tax:				
Foreign currency translation (loss) income	(5,380)	(2,996)	(29,908)	18,081
Cash flow hedging instruments, unrealized gain	3,610	104	3,588	104
Postretirement benefit liabilities (loss) income	—	(33)	17	(21)
Other comprehensive (loss) income, net of income tax	(1,770)	(2,925)	(26,303)	18,164
Total comprehensive income	14,373	20,040	43,299	84,479
Less: Comprehensive (loss) income attributable to noncontrolling interests	(115)	294	106	837
Comprehensive income attributable to Ferro Corporation	\$ 14,488	\$ 19,746	\$ 43,193	\$ 83,642

See accompanying notes to condensed consolidated financial statements.

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## Ferro Corporation and Subsidiaries

## Condensed Consolidated Balance Sheets

	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
<b>ASSETS</b>		
Current assets		
Cash and cash equivalents	\$ 126,278	\$ 63,551
Accounts receivable, net	381,435	354,416
Inventories	377,555	324,180
Other receivables	70,261	67,137
Other current assets	27,084	16,448
Total current assets	982,613	825,732
Other assets		
Property, plant and equipment, net	353,878	321,742
Goodwill	214,750	195,369
Intangible assets, net	189,689	187,616
Deferred income taxes	102,606	108,025
Other non-current assets	38,423	43,718
Total assets	\$ 1,881,959	\$ 1,682,202
<b>LIABILITIES AND EQUITY</b>		
Current liabilities		
Loans payable and current portion of long-term debt	\$ 9,637	\$ 25,136
Accounts payable	217,266	211,711
Accrued payrolls	38,855	48,201
Accrued expenses and other current liabilities	78,809	70,151
Total current liabilities	344,567	355,199
Other liabilities		
Long-term debt, less current portion	923,640	726,491
Postretirement and pension liabilities	159,895	166,680
Other non-current liabilities	65,856	77,152
Total liabilities	1,493,958	1,325,522
Equity		
Ferro Corporation shareholders' equity:		
Common stock, par value \$1 per share; 300.0 million shares authorized; 93.4 million shares issued; 83.7 million and 84.0 million shares outstanding at September 30, 2018, and December 31, 2017, respectively	93,436	93,436
Paid-in capital	296,069	302,158
Retained earnings	245,002	171,744
Accumulated other comprehensive loss	(101,392)	(75,468)



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Common shares in treasury, at cost	(154,086)	(147,056)
Total Ferro Corporation shareholders' equity	379,029	344,814
Noncontrolling interests	8,972	11,866
Total equity	388,001	356,680
Total liabilities and equity	\$ 1,881,959	\$ 1,682,202

See accompanying notes to condensed consolidated financial statements.

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## Ferro Corporation and Subsidiaries

## Condensed Consolidated Statements of Equity

	Ferro Corporation Shareholders Common Shares in Treasury		Common Stock	Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive (Loss)	Non- controlling Interests	Total Equity
	Shares (In thousands)	Amount						
Balances at December 31, 2016	9,996	\$ (160,936)	\$ 93,436	\$ 306,566	\$ 114,690	\$ (106,643)	\$ 7,919	\$ 255,032
Net income	—	—	—	—	65,740	—	575	66,315
Other comprehensive income	—	—	—	—	—	17,902	262	18,164
Stock-based compensation transactions	(359)	9,036	—	(3,138)	—	—	—	5,898
Change in ownership interests	—	—	—	—	—	—	2,178	2,178
Distributions to noncontrolling interests	—	—	—	—	—	—	(474)	(474)
Balances at September 30, 2017	9,637	(151,900)	93,436	303,428	180,430	(88,741)	10,460	347,113
Balances at December 31, 2017	9,386	(147,056)	93,436	302,158	171,744	(75,468)	11,866	356,680
Net income	—	—	—	—	69,117	—	485	69,602
Other comprehensive loss	—	—	—	—	—	(25,924)	(379)	(26,303)
Purchase of treasury stock	807	(16,999)	—	—	—	—	—	(16,999)
Stock-based compensation transactions	(415)	9,969	—	(6,878)	—	—	—	3,091
	—	—	—	789	—	—	(2,228)	(1,439)

Change in ownership interest								
Distributions to noncontrolling interests	—	—	—	—	—	—	(772)	(772)
Adjustment for accounting standards update 2016-16	—	—	—	—	4,141	—	—	4,141
Balances at September 30, 2018	9,778	\$ (154,086)	\$ 93,436	\$ 296,069	\$ 245,002	\$ (101,392)	\$ 8,972	\$ 388,001

See accompanying notes to condensed consolidated financial statements.

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## Ferro Corporation and Subsidiaries

## Condensed Consolidated Statements of Cash Flows

	Nine Months Ended September 30,	
	2018	2017
	(Dollars in thousands)	
Cash flows from operating activities		
Net cash provided by operating activities	\$ 35,686	\$ 34,691
Cash flows from investing activities		
Capital expenditures for property, plant and equipment and other long lived assets	(64,154)	(30,134)
Proceeds from sale of equity method investment	—	2,268
Business acquisitions, net of cash acquired	(47,802)	(71,930)
Other investing activities	37	551
Net cash used in investing activities	(111,919)	(99,245)
Cash flows from financing activities		
Net (repayments) under loans payable	(17,182)	(10,803)
Proceeds from revolving credit facility - 2014 Credit Facility	—	15,628
Principal payments on revolving credit facility - 2014 Credit Facility	—	(327,183)
Proceeds from term loan facility - Credit Facility	—	623,827
Principal payments on term loan facility - 2014 Credit Facility	—	(243,250)
Principal payments on term loan facility - Credit Facility	(304,060)	(3,232)
Principal payments on term loan facility - Amended Credit Facility	(4,100)	—
Proceeds from term loan facility - Amended Credit Facility	466,075	—
Proceeds from revolving credit facility - Credit Facility	134,950	69,787
Principal payments on revolving credit facility - Credit Facility	(212,950)	(42,400)
Proceeds from revolving credit facility - Amended Credit Facility	168,023	—
Principal payments on revolving credit facility - Amended Credit Facility	(56,090)	—
Proceeds from other long-term debt	—	2,700
Principal payments on other long-term debt	—	(2,978)
Payment of debt issuance costs	(3,466)	(12,927)
Acquisition-related contingent consideration payment	(9,464)	(1,315)
Purchase of treasury stock	(16,999)	—
Other financing activities	(3,516)	182
Net cash provided by financing activities	141,221	68,036
Effect of exchange rate changes on cash and cash equivalents	(2,261)	3,147
Increase in cash and cash equivalents	62,727	6,629
Cash and cash equivalents at beginning of period	63,551	45,582
Cash and cash equivalents at end of period	\$ 126,278	\$ 52,211
Cash paid during the period for:		
Interest	\$ 24,857	\$ 20,594
Income taxes	\$ 17,577	\$ 16,619

See accompanying notes to condensed consolidated financial statements.

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Ferro Corporation and Subsidiaries

Notes to Condensed Consolidated Financial Statements

1. Basis of Presentation

The accompanying unaudited condensed consolidated financial statements of Ferro Corporation (“Ferro,” “we,” “us” or “the Company”) have been prepared in accordance with accounting principles generally accepted in the United States of America (“U.S. GAAP”) for interim financial information, the instructions to Form 10-Q, and Article 10 of Regulation S-X. These statements reflect all normal and recurring adjustments which are, in the opinion of management, necessary to present fairly the financial position, results of operations and cash flows for the periods presented. The preparation of financial statements in conformity with U.S. GAAP requires us to make estimates and assumptions that affect the amounts reported in the financial statements and accompanying notes. These interim condensed consolidated financial statements should be read in conjunction with the consolidated financial statements and related notes included in our Annual Report on Form 10-K for the year ended December 31, 2017.

We produce our products primarily in the Europe, Middle East and Africa (“EMEA”) region, the United States, the Asia Pacific region, and Latin America.

Operating results for the three and nine months ended September 30, 2018, are not necessarily indicative of the results expected in subsequent quarters or for the full year ending December 31, 2018.

2. Recent Accounting Pronouncements

Recently Adopted Accounting Standards

On April 1, 2018, we adopted Financial Accounting Standards Board (“FASB”) Accounting Standards Update (“ASU”) 2017-12, Derivatives and Hedging (Topic 815): Targeted Improvements to Accounting for Hedging Activities. ASU 2017-12 provides guidance to better align an entity’s risk management activities and financial reporting for hedging relationships through changes to both the designation and measurement guidance for qualifying hedging relationships and the presentation of hedge results. The adoption of this ASU did not have an impact to the opening balance of Retained earnings. We will apply the guidance of this ASU to applicable future transactions.

On April 1, 2018, we adopted FASB ASU 2018-03, Technical Corrections and Improvements to Financial Instruments - Overall (Subtopic 825-10): Recognition and Measurement of Financial Assets and Financial Liabilities. ASU 2018-03 provides targeted improvements to address certain aspects of recognition, measurement presentation, and disclosure of financial instruments. The adoption of ASU 2018-03 did not have a material impact on the Company’s condensed consolidated financial statements.

On January 1, 2018, we adopted FASB ASU 2017-09, Compensation – Stock Compensation: (Topic 718): Scope of Modification Accounting. ASU 2017-09 provides guidance about which changes to the terms or conditions of a

share-based payment award require an entity to apply modification accounting in Topic 718. This new guidance would only impact our consolidated financial statements if, in the future, we modified the terms of any of our share-based awards. We will apply the guidance of this ASU to applicable future transactions. The adoption of ASU 2017-09 did not have a material impact on the Company's condensed consolidated financial statements.

On January 1, 2018, we adopted FASB ASU 2017-07, Compensation – Retirement Benefits: (Topic 715): Improving the Presentation of Net Periodic Pension Cost and Net Periodic Postretirement Benefit Costs. ASU 2017-07 requires that an employer report the service cost component in the same line item as other compensation costs arising from services rendered during the period. The other components of net benefit costs are to be presented in the income statement separately from the service cost component and outside a subtotal of income from operations. This ASU also allows only the service cost component of net benefit costs to be eligible for capitalization. We adopted this ASU using the retrospective approach for the presentation of the service cost component and the other components of the net periodic pension (credit) cost and net periodic postretirement benefit cost in the income statement. This resulted in the reclassification of income of \$0.5 million and \$1.4 million from Selling, general and administrative expenses to Other income, expense in our condensed consolidated statement of operations for the three and nine months ended September 30, 2018, respectively. The Company used a practical expedient where the amount disclosed in our Retirement Benefits footnote for the prior

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year comparative period was the basis for the estimation for applying the retrospective presentation requirements. Other than this reclassification, the adoption of ASU 2017-07 did not have an impact on the Company's condensed consolidated financial statements.

On January 1, 2018, we adopted FASB ASU 2017-01, Business Combinations: (Topic 805): Clarifying the Definition of a Business. ASU 2017-01 is intended to clarify the definition of a business with the objective of adding guidance to assist entities in evaluating whether transactions should be accounted for as acquisitions (or dispositions) of assets or businesses. We will apply the guidance of this ASU to applicable future transactions. The adoption of ASU 2017-01 did not have a material impact on the Company's condensed consolidated financial statements.

On January 1, 2018, we adopted FASB ASU 2016-16, Income Taxes: (Topic 740): Intra-Entity Transfers of Assets Other Than Inventory. ASU 2016-16 is intended to improve the accounting for the income tax consequences of intra-entity transfers of assets other than inventory and requires the recognition of the income tax consequences of an intra-entity transfer of an asset, other than inventory, when the transfer occurs. We adopted this ASU using the modified retrospective method. The impact of adopting this guidance on the Company's condensed consolidated financial statements resulted in an increase to Retained earnings of \$4.1 million and Deferred income taxes of \$4.7 million and a decrease to Other receivables of \$0.6 million on January 1, 2018.

On January 1, 2018, we adopted FASB ASU 2016-15, Statement of Cash Flow: (Topic 230): Classification of Certain Cash Receipts and Cash Payments. ASU 2016-15 is intended to address eight specific cash flow issues with the objective of reducing the existing diversity in practice. Adoption of ASU 2016-15 did not have a material effect on our condensed consolidated financial statements.

On January 1, 2018, we adopted FASB ASU 2014-09, Revenue from Contracts with Customers: (Topic 606) ("ASC 606"). This ASU replaces nearly all existing U.S. GAAP guidance on revenue recognition. The standard prescribes a five-step model for recognizing revenue, the application of which require significant judgment. We have completed our assessment and review of specific contracts and have adopted this ASU using the modified retrospective method with no impact to the opening Retained earnings balance. We expect the impact of the adoption of this ASU will not have a material effect on our consolidated financial statements on an ongoing basis.

## New Accounting Standards

In August 2018, the FASB issued ASU 2018-14, Compensation-Retirement Benefits-Defined Benefit Plans-General (Subtopic 715-20): Disclosure Framework-Changes to the Disclosure Requirements for Defined Benefit Plans. ASU 2018-14 modifies disclosure requirements for employers that sponsor defined benefit pension or other postretirement plans. This pronouncement is effective for fiscal years beginning after December 15, 2020. The Company is in the process of assessing the impact that the adoption of this ASU will have on our consolidated financial statements.

In August 2018, the FASB issued ASU 2018-13, Fair Value Measurement (Topic 820): Disclosure Framework-Changes to the Disclosure Requirements for Fair Value Measurement. ASU 2018-13 modifies the disclosure requirements on fair value measurements. This pronouncement is effective for fiscal years beginning after December 15, 2019, including interim periods within those fiscal years. Early adoption is permitted. The Company is in the process of assessing the impact that the adoption of this ASU will have on our consolidated financial statements.



In February 2018, the FASB issued ASU 2018-02, Income Statement – Reporting Comprehensive Income (Topic 220): Reclassification of Certain Tax Effects from Accumulated Other Comprehensive Income. ASU 2018-02 allows a reclassification from Accumulated Other Comprehensive (Loss) Income to Retained Earnings for stranded tax effects resulting from the Tax Cuts and Jobs Act and requires certain disclosures about stranded tax effects. This pronouncement is effective for fiscal years beginning after December 15, 2018, including interim periods within those fiscal years. Early adoption is permitted, including adoption in any interim period. The Company is in the process of assessing the impact that the adoption of this ASU will have on our consolidated financial statements.

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In January 2017, the FASB issued ASU 2017-04, Intangibles – Goodwill and Other: (Topic 350): Simplifying the Test for Goodwill Impairment. ASU 2017-04 is intended to simplify the subsequent measurement of goodwill by eliminating Step 2 from the current goodwill impairment test. This pronouncement is effective for the annual or any interim goodwill impairment tests conducted in fiscal years beginning after December 15, 2019. The Company is in the process of assessing the impact that the adoption of this ASU will have on our consolidated financial statements.

In February 2016, the FASB issued ASU 2016-02, Leases: (Topic 842). ASU 2016-02 requires companies to recognize a lease liability and asset on the balance sheet for operating leases with a term greater than one year. In July 2018, the FASB issued ASU 2018-11, Targeted Improvements. This ASU provides an additional transition method to adopt the new leasing standard. Under this new transition method, an entity initially applies the new leasing standard using a cumulative-effect adjustment to the opening balance of retained earnings but will continue to report comparative periods under existing guidance in accordance with ASC 840, Leases. The amendments in ASU 2018-11 are effective for fiscal years beginning after December 15, 2018, and interim periods within those fiscal years. The Company has elected to adopt ASU 2016-02 using this new transition method. The Company is in the process of assessing the impact the adoption of this ASU will have on our consolidated financial statements.

No other new accounting pronouncements issued had, or are expected to have, a material impact on the Company's consolidated financial statements.

### 3. Revenue

#### Revenue Recognition

Under ASC 606, revenues are recognized when control of the promised goods is transferred to our customers, in an amount that reflects the consideration we expect to be entitled to in exchange for those goods. In order to achieve that core principle, the Company applies the following five-step approach: 1) identify the contract with a customer, 2) identify the performance obligations, 3) determine the transaction price, 4) allocate the transaction price to the performance obligations in the contract, and 5) recognize revenue when a performance obligation is satisfied.

The Company considers confirmed customer purchase orders, which in some cases are governed by master sales agreements, to be the contracts, from an accounting perspective, with customers. Under our standard contracts, the only performance obligation is the delivery of manufactured goods and the performance obligation is satisfied at a point in time, when the Company transfers control of the manufactured goods. The Company may receive orders for products to be delivered over multiple dates that may extend across several reporting periods. The Company invoices for each order and recognizes revenue for each distinct product upon shipment, once transfer of control has occurred. Payment terms are standard for the industry and jurisdiction in which we operate. In determining the transaction price, the Company evaluates whether the price is subject to refund or adjustment, to determine the net

consideration to which the Company expects to be entitled. Discounts or rebates are specifically stated in customer contracts or invoices, and are recorded as a reduction of revenue in the period the related revenue is recognized. The product price as specified on the customer confirmed orders is considered the standalone selling price. The Company allocates the transaction price to each distinct product based on its relative standalone selling price. Revenue is recognized when control of the product is transferred to the customer (i.e., when the Company's performance obligation is satisfied), which generally occurs at shipment. We review material contracts to determine transfer of control based upon the business practices and legal requirements of each country.

The amount of shipping and handling fees invoiced to our customers at the time our product is shipped is included in net sales as we are the principal in those activities. Sales, valued-added and other taxes collected from our customers and remitted to governmental authorities are excluded from net sales.

There were no changes in amounts previously reported in the Company's condensed consolidated financial statements due to adopting ASC 606.

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Revenues disaggregated by geography and reportable segment for the three months ended September 30, 2018, follow:

	EMEA	United States	Asia Pacific	Latin America	Total
	(Dollars in thousands)				
Performance Coatings	\$ 110,261	\$ 12,170	\$ 27,914	\$ 25,594	\$ 175,939
Performance Colors and Glass	55,782	43,087	18,564	5,844	123,277
Color Solutions	33,276	43,699	10,136	8,836	95,947
Total net sales	\$ 199,319	\$ 98,956	\$ 56,614	\$ 40,274	\$ 395,163

Revenues disaggregated by geography and reportable segment for the three months ended September 30, 2017, follow:

	EMEA	United States	Asia Pacific	Latin America	Total
	(Dollars in thousands)				
Performance Coatings	\$ 83,910	\$ 11,365	\$ 24,264	\$ 26,699	\$ 146,238
Performance Colors and Glass	52,408	35,836	16,663	5,671	110,578
Color Solutions	33,400	41,190	9,937	8,669	93,196
Total net sales	\$ 169,718	\$ 88,391	\$ 50,864	\$ 41,039	\$ 350,012

Revenues disaggregated by geography and reportable segment for the nine months ended September 30, 2018, follow:

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	EMEA	United States	Asia Pacific	Latin America	Total
	(Dollars in thousands)				
Performance Coatings	\$ 355,510	\$ 36,704	\$ 82,990	\$ 78,832	\$ 554,036
Performance Colors and Glass	180,801	118,682	53,142	17,184	369,809
Color Solutions	109,985	126,598	30,606	25,900	293,089
Total net sales	\$ 646,296	\$ 281,984	\$ 166,738	\$ 121,916	\$ 1,216,934

Revenues disaggregated by geography and reportable segment for the nine months ended September 30, 2017, follow:

	EMEA	United States	Asia Pacific	Latin America	Total
	(Dollars in thousands)				
Performance Coatings	\$ 241,884	\$ 33,727	\$ 68,670	\$ 80,268	\$ 424,549
Performance Colors and Glass	144,586	112,772	47,091	16,284	320,733
Color Solutions	103,538	118,886	26,971	24,522	273,917
Total net sales	\$ 490,008	\$ 265,385	\$ 142,732	\$ 121,074	\$ 1,019,199

#### Practical Expedients and Exemptions

All material contracts have an original duration of one year or less and, as such, the Company uses the practical expedient applicable to such contracts, and has not disclosed the transaction price for the remaining performance obligations as of the end of each reporting period, or when the Company expects to recognize this revenue.

When the period of time between the transfer of control of the goods and the time the customer pays for the goods is one year or less, the Company uses the practical expedient allowed by ASC 606 that provides relief from adjusting the amount of promised consideration for the effects of a financing component.

We generally expense sales commissions when incurred because the amortization period is one year or less. These costs are recorded within Selling, general and administrative expenses.

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4. Acquisitions

UWiZ Technology Co., Ltd.

On September 25, 2018, the Company acquired 100% of the equity interests of UWiZ Technology Co., Ltd. (“UWiZ”) for TWD823.4 million (approximately \$26.9 million) in cash. The information included herein has been prepared based on the preliminary allocation of the purchase price using estimates of the fair value and useful lives of the assets acquired and liabilities assumed, which were determined with the assistance of third parties who performed independent valuations using discounted cash flow and comparative market approaches, and estimates made by management. As of September 30, 2018, the purchase price allocation is subject to further adjustment until all information is fully evaluated by the Company. The Company preliminarily recorded \$12.5 million of net working capital, \$7.1 million of goodwill, \$6.6 million of amortizable intangible assets, \$2.4 million of personal and real property and \$1.7 million of deferred tax liability on the condensed consolidated balance sheet.

Ernst Diegel GmbH

On August 31, 2018, the Company acquired 100% of the equity interests of Ernst Diegel GmbH (“Diegel”), including the real property of a related party, for €12.1 million (approximately \$14.0 million) in cash. The information included herein has been prepared based on the preliminary allocation of the purchase price using estimates of the fair value and useful lives of the assets acquired and liabilities assumed, which were determined with the assistance of third parties who performed independent valuations using discounted cash flow and comparative market approaches, and estimates made by management. As of September 30, 2018, the purchase price allocation is subject to further adjustment until all information is fully evaluated by the Company. The Company preliminarily recorded \$7.0 million of personal and real property, \$4.8 million of net working capital, \$2.8 million of goodwill, \$2.6 million of deferred tax liability and \$2.0 million of amortizable intangible assets on the condensed consolidated balance sheet.

MRA Laboratories, Inc.

On July 12, 2018, the Company acquired 100% of the equity interests of MRA Laboratories, Inc. (“MRA”) for \$15.7 million in cash. The information included herein has been prepared based on the preliminary allocation of the purchase price using estimates of the fair value and useful lives of the assets acquired and liabilities assumed, which were determined with the assistance of third parties who performed independent valuations using discounted cash flow and comparative market approaches, and estimates made by management. As of September 30, 2018, the purchase price allocation is subject to further adjustment until all information is fully evaluated by the Company. The Company preliminarily recorded \$6.9 million of goodwill, \$6.7 million of amortizable intangible assets, \$3.4 million of net working capital, \$1.6 million of deferred tax liability and \$0.3 million of personal and real property on the condensed consolidated balance sheet.

PT Ferro Materials Utama

On June 29, 2018, the Company acquired 66% of the equity interests of PT Ferro Materials Utama (“FMU”) for \$2.7 million in cash, in addition to the forgiveness of debt of \$9.2 million, bringing our total ownership to 100%. The Company previously recorded its investment in FMU as an equity method investment, and following this transaction, the Company fully consolidates FMU. Due to the change of control that occurred, the Company recorded a gain on purchase of \$2.6 million, which is recorded in Miscellaneous expense (income), net, related to the difference between the Company’s carrying value and fair value of the previously held equity method investment during the second quarter of 2018.

Endeka Group

On November 1, 2017, the Company acquired 100% of the equity interests of Endeka Group (“Endeka”), a global producer of high-value coatings and key raw materials for the ceramic tile market, for €72.8 million (approximately \$84.8 million), including the assumption of debt of €13.1 million (approximately \$15.3 million). The Company incurred acquisition costs for the nine months ended September 30, 2018, of \$0.5 million, which is included in Selling, general and administrative expenses in our condensed consolidated statements of operations. The acquired business contributed net sales of \$25.6 million and \$86.8 million for the three and nine months ended September 30, 2018, respectively, and net income attributable to Ferro Corporation of \$0.6 million and \$9.4 million for the three and nine months ended September 30, 2018, respectively.

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The information included herein has been prepared based on the preliminary allocation of the purchase price using estimates of the fair value and useful lives of the assets acquired and liabilities assumed, which were determined with the assistance of third parties who performed independent valuations using discounted cash flow and comparative market approaches, and estimates made by management. During the first half of 2018, the Company adjusted the net working capital on the opening balance sheet and as such, the carrying amount of the personal and real property decreased \$4.1 million. As of September 30, 2018, the purchase price allocation is subject to further adjustment until all information is fully evaluated by the Company. The Company preliminarily recorded \$44.1 million of net working capital, \$24.1 million of deferred tax assets, \$17.7 million of personal and real property and \$1.1 million of noncontrolling interest on the condensed consolidated balance sheet.

### Gardenia Quimica S.A.

On August 3, 2017, the Company acquired a majority interest of Gardenia Quimica S.A. (“Gardenia”) for \$3.0 million. The Company previously owned 46% of Gardenia and recorded it as an equity method investment. Following this transaction, the Company owned 83.5% and fully consolidates Gardenia. Due to the change of control that occurred, the Company recorded a gain on purchase of \$2.6 million related to the difference between the Company’s carrying value and fair value of the previously held equity method investment during the third quarter of 2017. On March 1, 2018, the Company acquired the remaining equity interest in Gardenia for \$1.4 million.

### Dip Tech Ltd.

On August 2, 2017, the Company acquired 100% of the equity interests of Dip Tech Ltd. (“Dip-Tech”), a leading provider of digital printing solutions for glass coatings, for \$77.0 million. Dip-Tech is headquartered in Kfar Saba, Israel. The purchase price consideration consisted of cash paid at closing of \$60.1 million, net of the net working capital adjustment, and contingent consideration of \$16.9 million. The Company incurred acquisition costs of \$0.1 million and \$2.1 million for the nine months ended September 30, 2018 and 2017, respectively, which is included in Selling, general and administrative expenses in our condensed consolidated statements of operations. The acquired business contributed net sales of \$7.7 million and \$18.6 million for the three and nine months ended September 30, 2018, respectively, and net loss attributable to Ferro Corporation of \$0.7 million and \$4.7 million for the three and nine months ended September 30, 2018, respectively. The acquired business contributed net sales of \$6.4 million for the three and nine months ended September 30, 2017, and net loss attributable to Ferro Corporation of \$1.1 million for the three and nine months ended September 30, 2017. The net loss attributable to Ferro Corporation was driven by acquired intangible asset amortization costs of \$0.9 million and \$2.9 million for the three and nine months ended September 30, 2018, respectively and \$0.6 million for the three and nine months ended September 30, 2017. Dip-Tech incurred research and development costs of \$1.3 million and \$4.6 million for the three and nine months ended September 30, 2018, respectively and \$1.1 million for the three and nine months ended September 30, 2017.

The information included herein has been prepared based on the allocation of the purchase price using the fair value and useful lives of the assets acquired and liabilities assumed, which were determined with the assistance of third parties who performed independent valuations using discounted cash flow and comparative market approaches, and estimates made by management. The Company recorded \$41.2 million of amortizable intangible assets, \$33.5 million of goodwill, \$7.2 million of a deferred tax liability, \$5.1 million of indefinite-lived intangible assets, \$3.2 million of personal and real property and \$1.2 million of net working capital on the condensed consolidated balance sheet.

### Smalti per Ceramiche, s.r.l

On April 24, 2017, the Company acquired 100% of the equity interests of S.P.C. Group s.r.l., and 100% of the equity interests of Smalti per Ceramiche, s.r.l. (“SPC”), for €18.7 million (approximately \$20.3 million), including the



assumption of debt of €5.7 million (approximately \$6.2 million). SPC is a high-end tile coatings manufacturer based in Italy focused on fast-growing specialty products. SPC's products, strong technology, design capabilities, and customer-centric business model are complementary to our Performance Coatings segment, and position us for continued growth in the high-end tile markets.

The information included herein has been prepared based on the allocation of the purchase price using the fair value and useful lives of the assets acquired and liabilities assumed, which were determined with the assistance of third parties who performed independent valuations using discounted cash flow and comparative market approaches, and estimates made by management. The

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Company recorded \$6.1 million of personal and real property, \$6.0 million of amortizable intangible assets, \$5.2 million of goodwill, \$5.0 million of net working capital and \$2.0 million of a deferred tax liability on the condensed consolidated balance sheet.

## 5. Inventories

	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
Raw materials	\$ 130,660	\$ 112,300
Work in process	58,622	39,454
Finished goods	188,273	172,426
Total inventories	\$ 377,555	\$ 324,180

In the production of some of our products, we use precious metals, which we obtain from financial institutions under consignment agreements with terms of one year or less. The financial institutions retain ownership of the precious metals and charge us fees based on the amounts we consign. These fees were \$0.5 million and \$0.3 million for the three months ended September 30, 2018 and 2017, respectively, and were \$1.3 million and \$0.8 million for the nine months ended September 30, 2018 and 2017, respectively. We had on-hand precious metals owned by participants in our precious metals consignment program of \$47.1 million at September 30, 2018, and \$37.7 million at December 31, 2017, measured at fair value based on market prices for identical assets.

## 6. Property, Plant and Equipment

Property, plant and equipment is reported net of accumulated depreciation of \$520.9 million at September 30, 2018, and \$502.9 million at December 31, 2017. Unpaid capital expenditure liabilities, which are non-cash investing activities, were \$7.7 million at September 30, 2018, and \$3.2 million at September 30, 2017.



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## 7. Goodwill and Other Intangible Assets

Details and activity in the Company's goodwill by segment follow:

	Performance Coatings (Dollars in thousands)	Color Solutions	Performance Colors and Glass	Total
Goodwill, net at December 31, 2017	\$ 38,236	\$ 42,535	\$ 114,598	\$ 195,369
Acquisitions	5,140 (2)	9,984 (4)	8,236 (1),(3)	23,360
Foreign currency adjustments	(1,533)	(663)	(1,783)	(3,979)
Goodwill, net at September 30, 2018	\$ 41,843	\$ 51,856	\$ 121,051	\$ 214,750

(1) During the first quarter of 2018, the Company recorded a purchase price adjustment within the measurement period for goodwill related to the Dip-Tech acquisition.

(2) During the second quarter of 2018, the Company recorded goodwill related to the FMU acquisition.

(3) During the third quarter of 2018, the Company recorded goodwill related to the MRA acquisition. Refer to Note 4 for additional details.

(4) During the third quarter of 2018, the Company recorded goodwill related to the UWIZ and Diegel acquisition. Refer to Note 4 for additional details.

	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
Goodwill, gross	\$ 273,217	\$ 253,836
Accumulated impairment	(58,467)	(58,467)
Goodwill, net	\$ 214,750	\$ 195,369

Goodwill is tested for impairment at the reporting unit level on an annual basis in the fourth quarter, and between annual tests if an event occurs, or circumstances change, that would more likely than not reduce the fair value of a reporting unit below its carrying value. As of September 30, 2018, the Company is not aware of any events or circumstances that occurred which would require a goodwill impairment test.



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Amortizable intangible assets consisted of the following:

	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
Gross amortizable intangible assets:		
Patents	\$ 5,200	\$ 5,279
Land rights	4,781	4,947
Technology/know-how and other	135,683	131,070
Customer relationships	98,468	93,500
Total gross amortizable intangible assets	244,132	234,796
Accumulated amortization:		
Patents	(5,149)	(5,226)
Land rights	(2,888)	(2,883)
Technology/know-how and other	(49,063)	(45,214)
Customer relationships	(14,270)	(11,114)
Total accumulated amortization	(71,370)	(64,437)
Amortizable intangible assets, net	\$ 172,762	\$ 170,359

Indefinite-lived intangible assets consisted of the following:

	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
Indefinite-lived intangibles assets:		
Trade names and trademarks	\$ 16,927	\$ 17,257

8. Debt

Loans payable and current portion of long-term debt consisted of the following:

	September	December
	30,	31,
	2018	2017
	(Dollars in thousands)	
Loans payable	\$ —	\$ 16,360
Current portion of long-term debt	9,637	8,776
Loans payable and current portion of long-term debt	\$ 9,637	\$ 25,136

Long-term debt consisted of the following:

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	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
Term loan facility, net of unamortized issuance costs, maturing 2024(1)	\$ 810,837	\$ 645,242
Revolving credit facility	111,933	78,000
Capital lease obligations	4,182	4,913
Other notes	6,325	7,112
Total long-term debt	933,277	735,267
Current portion of long-term debt	(9,637)	(8,776)
Long-term debt, less current portion	\$ 923,640	\$ 726,491

(1) The carrying value of the term loan facility, maturing 2024, is net of unamortized debt issuance costs of \$5.1 million at September 30, 2018, and \$7.5 million at December 31, 2017.



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### Amended Credit Facility

On April 25, 2018, the Company entered into an amendment (the “Amended Credit Facility”) to its existing credit facility (the “Credit Facility”) which Amended Credit Facility (a) provided a new revolving facility (the “2018 Revolving Facility”), which replaced the Company’s existing revolving facility, (b) repriced the (“Tranche B-1 Loans”), (c) provided new tranches of term loans (“Tranche B-2 Loans” and “Tranche B-3 Loans”) denominated in U.S. dollars and borrowed by the Company’s existing credit facility and will be used for ongoing working capital requirements and general corporate purposes. The (“Tranche B-2 Loans”) are borrowed by the Company and the (“Tranche B-3 Loans”) are borrowed on a joint and several basis by Ferro GmbH and Ferro Europe Holdings LLC.

The Amended Credit Facility consists of a \$500 million secured revolving line of credit with a maturity of February 2023, a \$355 million secured term loan facility with a maturity of February 2024, a \$235 million secured term loan facility with a maturity of February 2024 and a \$230 million secured term loan facility with a maturity of February 2024. The term loans are payable in equal quarterly installments in an amount equal to 0.25% of the original principal amount of the term loans, with the remaining balance due on the maturity date thereof. In addition, the Company is required, on an annual basis, to make a prepayment in an amount equal to a portion of the Company’s excess cash flow, as calculated pursuant to the Amended Credit Facility, which prepayment will be applied first to the term loans until they are paid in full, and then to the revolving loans.

Subject to the satisfaction of certain conditions, the Company can request additional commitments under the revolving line of credit or term loans in the aggregate principal amount of up to \$250 million to the extent that existing or new lenders agree to provide such additional commitments and/or term loans. The Company can also raise certain additional debt or credit facilities subject to satisfaction of certain covenant levels.

Certain of the Company’s U.S. subsidiaries have guaranteed the Company’s obligations under the Amended Credit Facility and such obligations are secured by (a) substantially all of the personal property of the Company and the U.S. subsidiary guarantors and (b) a pledge of 100% of the stock of certain of the Company’s U.S. subsidiaries and 65% of the stock of certain of the Company’s direct foreign subsidiaries. The Tranche B-3 Loans are guaranteed by the Company, the U.S. subsidiary guarantors and a cross-guaranty by the borrowers of the Tranche B-3 Loans, and are secured by the collateral securing the revolving loans and the other term loans, in addition to a pledge of the equity interests of Ferro GmbH.

**Interest Rate – Term Loans:** The interest rates applicable to the term loans will be, at the Company’s option, equal to either a base rate or a LIBOR rate plus, in both cases, an applicable margin.

- The base rate for term loans will be the highest of (i) the federal funds rate plus 0.50%, (ii) syndication agent’s prime rate, (iii) the daily LIBOR rate plus 1.00% or (iv) 0.00%. The applicable margin for base rate loans is 1.25%.
- The LIBOR rate for term loans shall not be less than 0.0% and the applicable margin for LIBOR rate term loans is 2.25%.
- For LIBOR rate term loans, the Company may choose to set the duration on individual borrowings for periods of one, two, three or six months, with the interest rate based on the applicable LIBOR rate for the corresponding duration.

At September 30, 2018, the Company had borrowed \$353.2 million under the Tranche B-1 Loans at an interest rate of 4.64%, \$233.8 million under the Tranche B-2 Loans at an interest rate of 4.64%, and \$228.9 million under the Tranche B-3 Loans at an interest rate of 4.64%. At September 30, 2018, there were no additional borrowings available under the Tranche B-1 Loans, Tranche B-2 Loans, and Tranche B-3 Loans.

**Interest Rate – Revolving Credit Line:** The interest rates applicable to loans under the revolving credit line will be, at the Company’s option, equal to either a base rate or a LIBOR rate plus, in both cases, an applicable variable

margin. The variable margin will be based on the ratio of (a) the Company's total consolidated net debt outstanding (as defined in the Amended Credit Agreement) at such time to (b) the Company's consolidated EBITDA (as defined in the Amended Credit Agreement) computed for the period of four consecutive fiscal quarters most recently ended.

- The base rate for revolving loans will be the highest of (i) the federal funds rate plus 0.50%, (ii) syndication agent's prime rate, (iii) the daily LIBOR rate plus 1.00% or (iv) 0.00%. The applicable margin for base rate loans will vary between 0.50% to 1.50%.

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- The LIBOR rate for revolving loans shall not be less than 0% and the applicable margin for LIBOR rate revolving loans will vary between 1.50% and 2.50%.
- For LIBOR rate revolving loans, the Company may choose to set the duration on individual borrowings for periods of one, two, three or six months, with the interest rate based on the applicable LIBOR rate for the corresponding duration.

At September 30, 2018, there were \$111.9 million borrowings under the revolving credit line at an interest rate of 2.59%. After reductions for outstanding letters of credit secured by these facilities, we had \$383.4 million of additional borrowings available under the revolving credit facilities at September 30, 2018.

The Amended Credit Facility contains customary restrictive covenants including, but not limited to, limitations on use of loan proceeds, limitations on the Company's ability to pay dividends and repurchase stock, limitations on acquisitions and dispositions, and limitations on certain types of investments. The Amended Credit Facility also contains standard provisions relating to conditions of borrowing and customary events of default, including the non-payment of obligations by the Company and the bankruptcy of the Company.

Specific to the 2018 Revolving Facility, the Company is subject to a financial covenant regarding the Company's maximum leverage ratio. If an event of default occurs, all amounts outstanding under the Amended Credit Facility agreement may be accelerated and become immediately due and payable. At September 30, 2018, we were in compliance with the covenants of the Amended Credit Facility.

### Credit Facility

On February 14, 2017, the Company entered into a credit facility (the "Credit Facility") with a group of lenders to refinance its then outstanding credit facility debt and to provide liquidity for ongoing working capital requirements and general corporate purposes. The Credit Facility consisted of a \$400 million secured revolving line of credit with a term of five years, a \$357.5 million secured term loan facility with a term of seven years and a €250 million secured Euro term loan facility with a term of seven years. For discussion of the Company's Credit Facility, refer to Note 8 in the Company's Annual Report on Form 10-K for the year ended December 31, 2017.

In conjunction with the refinancing of the Credit Facility, we recorded a charge of \$3.2 million in connection with the write-off of unamortized issuance costs, which is recorded within Loss on extinguishment of debt in our condensed consolidated statement of operations for the nine months ended September 30, 2018.

### 2014 Credit Facility

In 2014, the Company entered into a credit facility that was amended on January 25, 2016, and August 29, 2016, resulting in a \$400 million secured revolving line of credit with a term of five years and a \$300 million secured term loan facility with a term of seven years from the original issuance date (the "2014 Credit Facility") with a group of lenders that was replaced on February 14, 2017, by the Credit Facility (as defined above). For discussion of the Company's 2014 Credit Facility, refer to Note 8 in the Company's Annual Report on Form 10-K for the year ended December 31, 2017.

In conjunction with the refinancing of the 2014 Credit Facility, we recorded a charge of \$3.9 million in connection with the write-off of unamortized issuance costs, which is recorded within Loss on extinguishment of debt in our condensed consolidated statement of operations for the nine months ended September 30, 2017.

### Other Financing Arrangements

We maintain other lines of credit to provide global flexibility for our short-term liquidity requirements. These facilities are uncommitted lines for our international operations and totaled \$40.3 million and \$64.5 million at September 30, 2018, and December 31, 2017, respectively. The unused portions of these lines provided additional liquidity of \$31.4 million at September 30, 2018, and \$39.4 million at December 31, 2017.

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## 9. Financial Instruments

The following financial instrument assets (liabilities) are presented at their respective carrying amount, fair value and classification within the fair value hierarchy:

	September 30, 2018		Level 1	Level 2	Level 3
	Carrying Amount	Fair Value Total			
	(Dollars in thousands)				
Cash and cash equivalents	\$ 126,278	\$ 126,278	\$ 126,278	\$ —	\$ —
Term loan facility, maturing 2024(1)	(810,837)	(813,897)	—	(813,897)	—
Revolving credit facility, maturing 2023	(111,933)	(117,535)	—	(117,535)	—
Other long-term notes payable	(6,325)	(3,835)	—	(3,835)	—
Cross currency swaps	14,069	14,069	—	14,069	—
Cross currency swaps	(992)	(992)	—	(992)	—
Interest rate swaps	1,714	1,714	—	1,714	—
Interest rate swaps	(689)	(689)	—	(689)	—
Foreign currency forward contracts, net	3,004	3,004	—	3,004	—

	December 31, 2017		Level 1	Level 2	Level 3
	Carrying Amount	Fair Value Total			
	(Dollars in thousands)				
Cash and cash equivalents	\$ 63,551	\$ 63,551	\$ 63,551	\$ —	\$ —
Loans payable	(16,360)	(16,360)	—	(16,360)	—
Term loan facility, maturing 2024(1)	(645,242)	(646,979)	—	(646,979)	—
Revolving credit facility, maturing 2022	(78,000)	(79,295)	—	(79,295)	—
Other long-term notes payable	(7,112)	(3,973)	—	(3,973)	—
Interest rate swaps	1,616	1,616	—	1,616	—
Interest rate swaps	(124)	(124)	—	(124)	—
Foreign currency forward contracts, net	(469)	(469)	—	(469)	—

(1) The carrying values of the term loan facility are net of unamortized debt issuance costs of \$5.1 million and \$7.5 million for the period ended September 30, 2018, and December 31, 2017, respectively.

The fair values of cash and cash equivalents are based on the fair values of identical assets. The fair values of loans payable are based on the present value of expected future cash flows and approximate their carrying amounts due to the short periods to maturity. The fair value of the term loan facility is based on market price information and is measured using the last available bid price of the instrument on a secondary market. The revolving credit facility and other long-term notes payable are based on the present value of expected future cash flows and interest rates that would be currently available to the Company for issuance of similar types of debt instruments with similar terms and remaining maturities adjusted for the Company's performance risk. The fair values of our interest rate swaps and cross currency swaps are determined based on inputs that are readily available in public markets or can be derived from information available in publicly quoted markets. The fair values of the foreign currency forward contracts are based on market prices for comparable contracts.

#### Derivative Instruments

The Company may use derivative instruments to partially offset its business exposure to foreign currency and interest rate risk on expected future cash flows, on net investment in certain foreign subsidiaries and on certain existing assets and liabilities. However,

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the Company may choose not to hedge in countries where it is not economically feasible to enter into hedging arrangements or where hedging inefficiencies exist, such as timing of transactions.

## Derivatives Designated as Hedging Instruments

**Cash Flow Hedges.** For derivative instruments that are designated and qualify as cash flow hedges, the effective portion of the gain or loss on the derivative is recorded in Accumulated other comprehensive loss (“AOCL”) and reclassified into earnings in the same period during which the hedged transaction affects earnings.

The Company utilizes interest rate swaps to limit exposure to market fluctuations on floating-rate debt. During the second quarter of 2017, the Company entered into interest rate swap agreements that converted \$150 million and €90 million of our term loans from variable interest rates to fixed interest rates. These swaps qualified for, and were designated as, cash flow hedges. This interest rate swap agreement was terminated in the second quarter of 2018 in connection with the refinancing of the Credit Facility.

During the second quarter of 2018, the Company entered into variable to fixed interest rate swaps with a maturity date of February 28, 2024. The notional amount is \$318.4 million at September 30, 2018. These swaps are hedging risk associated with the Tranche B-1 Loans. These interest rate swaps are designated as cash flow hedges. As of September 30, 2018, the Company expects it will reclassify net losses of approximately \$0.7 million, currently recorded in AOCL, into earnings within the next twelve months. However, the actual amount reclassified could vary due to future changes in the fair value of these derivatives.

The Company has converted a US dollar denominated, variable rate debt obligation into a euro fixed rate obligation using a receive-float, pay fixed cross currency swaps in the second quarter of 2018. These swaps are hedging risk associated with the Tranche B-3 Loans. These cross currency swaps are designated as cash flow hedges. The notional amount is \$228.9 million at September 30, 2018, with a maturity date of February 28, 2024. As of September 30, 2018, the Company expects it will reclassify net gains of approximately \$5.9 million, currently recorded in AOCL, into earnings within the next twelve months. However, the actual amount reclassified could vary due to future changes in the fair value of these derivatives.

The amount of gain recognized in AOCL and the amount of (loss) gain reclassified into earnings for the three months ended September 30, 2018 and 2017, follow:

	Amount of Gain Recognized in AOCL		Amount of (Loss) Gain Reclassified from AOCL into Income		Location of (Loss) Gain Reclassified from AOCL into Income
	2018	2017	2018	2017	
	(Dollars in thousands)				
Interest rate swaps	\$ 2,135	\$ 166	\$ (186)	\$ —	Interest expense
Cross currency swaps	3,237	—	1,327	—	Interest expense
			\$ 1,141	\$ —	Total Interest expense
Cross currency swaps			1,549	—	Foreign currency losses, net
			\$ 1,549	\$ —	Total Foreign currency losses, net





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The amount of gain recognized in AOCL and the amount of (loss) gain reclassified into earnings for the nine months ended September 30, 2018 and 2017, follow:

	Amount of Gain Recognized in AOCL		Amount of (Loss) Gain Reclassified from AOCL into Income		Location of (Loss) Gain Reclassified from AOCL into Income
	2018	2017	2018	2017	
	(Dollars in thousands)				
Interest rate swaps	\$ 1,761	\$ 166	\$ (197)	\$ —	Interest expense
Cross currency swaps	12,666	—	2,215	—	Interest expense
			\$ 2,018	\$ —	Total Interest expense
Cross currency swap			11,864	—	Foreign currency losses, net
			\$ 11,864	\$ —	Total Foreign currency losses, net

Net investment hedge. To help protect the value of the Company's net investment in European operations against adverse changes in exchange rates, the Company uses non-derivative financial instruments, such as its foreign currency denominated debt, as economic hedges of its net investments in certain foreign subsidiaries. Net investment hedges that use foreign currency denominated debt to hedge net investments are not impacted by ASC Topic 820, Fair Value Measurements, as the debt used as a hedging instrument is marked to a value with respect to changes in spot foreign currency exchange rates and not with respect to other factors that may impact fair value.

In the second quarter of 2017, the Company designated a portion of its Euro denominated debt as a net investment hedge for accounting purposes. This net investment hedge was terminated in the second quarter of 2018.

In the second quarter of 2018, the Company entered into cross currency swap agreements where we pay variable rate interest in Euros and receive variable rate interest in US dollars. The notional amount is \$116.9 million at September 30, 2018. These swaps are hedging risk associated with the Tranche B-2 Loans. These cross currency swaps are designated as net investment hedges with the spot method of accounting applied. The effective portions of net investment hedges are recorded in AOCL as a part of the cumulative translation adjustment.

The amount of gain (loss) recognized in AOCL, the amount reclassified into earnings and the amount of gain recognized in income on derivative (amount excluded from effectiveness testing) for the three months ended September 30, 2018 and 2017, follow:

Amount of Gain (Loss)	Amount of Gain Reclassified from	Amount of Gain Recognized in Income on Derivative (Amount
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	Recognized in AOCL		AOCL into Income		Excluded from Effectiveness Testing)		Location of Gain (Loss) in Earnings
	2018	2017	2018	2017	2018	2017	
	(Dollars in thousands)						
Cross currency swaps	\$ 1,272	\$ —	\$ —	\$ —	\$ 858	\$ —	Interest expense
Net investment hedge	—	(8,020)	—	—	—	—	Foreign currency losses, net

The amount of gain (loss) recognized in AOCL, the amount reclassified into earnings and the amount of gain recognized in income on derivative (amount excluded from effectiveness testing) for the nine months ended September 30, 2018 and 2017, follow:

	Amount of Gain (Loss)		Amount of Gain		Amount of Gain Recognized in Income on Derivative (Amount Excluded from Effectiveness Testing)		Location of Gain (Loss) in Earnings
	Recognized in AOCL	Recognized in AOCL	Reclassified from	Reclassified from	2018	2017	
	(Dollars in thousands)						
Cross currency swaps	\$ 4,046	\$ —	\$ —	\$ —	\$ 1,353	\$ —	Interest expense
Net investment hedge	—	(14,848)	—	—	—	—	Foreign currency losses, net

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## Derivatives Not Designated as Hedging Instruments

Foreign currency forward contracts. We manage foreign currency risks principally by entering into forward contracts to mitigate the impact of currency fluctuations on transactions. These forward contracts are not formally designated as hedges. Gains and losses on these foreign currency forward contracts are netted with gains and losses from currency fluctuations on transactions arising from international trade and reported as Foreign currency losses, net in the condensed consolidated statements of operations. We recognized net gains of \$1.3 million and \$2.7 million in the three and nine months ended September 30, 2018, respectively, and net losses of \$1.4 million and \$4.1 million in the three and nine months ended September 30, 2017, respectively, arising from the change in fair value of our financial instruments, which partially offset the related net gains and losses on international trade transactions. The notional amount of foreign currency forward contracts was \$371.1 million at September 30, 2018, and \$238.5 million at December 31, 2017.

The following table presents the effect on our condensed consolidated statements of operations for the three and nine months ended September 30, 2018 and 2017, respectively, of our foreign currency forward contracts:

	Amount of Gain (Loss) Recognized in Earnings Three Months Ended September 30, 2018    2017		Location of Gain (Loss) in Earnings
	(Dollars in thousands)		
Foreign currency forward contracts	\$ 1,339	\$ (1,438)	Foreign currency losses, net

Amount of Gain  
(Loss)  
Recognized in  
Earnings

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Nine Months  
Ended  
September 30,

	2018	2017	Location of Gain (Loss) in Earnings
	(Dollars in thousands)		
Foreign currency forward contracts	\$ 2,728	\$ (4,149)	Foreign currency losses, net
Location and Fair Value Amount of Derivative Instruments			

The following table presents the fair values of our derivative instruments on our condensed consolidated balance sheets. All derivatives are reported on a gross basis.

	September 30, 2018	December 31, 2017	Balance Sheet Location
	(Dollars in thousands)		
Asset derivatives:			
Interest rate swaps	\$ 1,714	\$ 1,616	Other non-current assets
Cross currency swaps	9,591	—	Other current assets
Cross currency swaps	4,478	—	Other non-current assets
Foreign currency forward contracts	3,664	661	Other current assets
Liability derivatives:			
Interest rate swaps	(689)	(124)	Accrued expenses and other current liabilities
Cross currency swaps	(992)	—	Other non-current liabilities
Foreign currency forward contracts	\$ (660)	\$ (1,130)	Accrued expenses and other current liabilities



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10. Income Taxes

Income tax expense for the nine months ended September 30, 2018, was \$29.2 million, or 29.6% of pre-tax income. Income tax expense for the nine months ended September 30, 2017, was \$23.2 million, or 25.9% of pre-tax income. The tax expense for the nine months ended September 30, 2018, as a percentage of pre-tax income, is higher than the U.S. federal statutory income tax rate of 21% primarily as a result of foreign statutory rate differences and discrete items recorded in the third quarter. The discrete items recorded in the third quarter primarily include a reduction to the tax expense related to the provision to return adjustments and an increase from the impact of resolving a foreign tax audit. The tax expense for the nine months ended September 30, 2017, as a percentage of pre-tax income, is lower than the U.S. federal statutory income tax rate of 35% primarily as a result of foreign statutory rate differences.

We have recognized the provisional tax impacts related to the 2017 Tax Cut and Jobs Act (the “Tax Act”) under the guidance of the SEC Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (“SAB 118”). The ultimate impact may differ from these provisional amounts due to additional analysis, changes in interpretations and assumptions, additional regulatory guidance that may be issued, and actions we may take as a result of the Tax Act. The Company’s preliminary determinations related to the estimable impacts of the Tax Act that are effective for the year ended December 31, 2017 have not changed in the current quarter.

The Company continues to review the anticipated impacts of the global intangible low taxed income (“GILTI”) and the foreign-derived intangible income (“FDII”) on the Company for 2018. For the current quarter the company has made reasonable estimates of GILTI and FDII, as well as the impact of changes to valuation allowances related to certain positions. The combined provisional net impact of these items are not anticipated to be material to the tax rate in 2018. The Company has not recorded any potential deferred tax effects related to GILTI in the financial statements and has not made a policy decision regarding whether to record deferred taxes on GILTI or use the period cost method.

11. Contingent Liabilities

We have recorded environmental liabilities of \$6.9 million at September 30, 2018, and \$6.7 million at December 31, 2017, for costs associated with the remediation of certain of our properties that have been contaminated. The liability at September 30, 2018, and December 31, 2017, was primarily comprised of liabilities related to a non-operating facility in Brazil, and for retained environmental obligations related to a site in the United States that was part of the sale of our North American and Asian metal powders product lines in 2013. The costs include legal and consulting fees, site studies, the design and implementation of remediation plans, post-remediation monitoring and related activities. The ultimate liability could be affected by numerous uncertainties, including the extent of contamination found, the required period of monitoring and the ultimate cost of required remediation. During the third quarter of 2018, the Company incurred a \$1.5 million environmental liability related to acquired subsidiaries.

In November 2017, Suffolk County Water Authority filed a complaint, Suffolk County Water Authority v. The Dow Chemical Company et al., against the Company and a number of other companies in the U.S. Federal Court for the Eastern District of New York with regard to the product 1,4 dioxane. The plaintiff alleges, among other things, that the Suffolk County water supply is contaminated with 1,4 dioxane and that the defendants are liable for unspecified costs of cleanup and remediation of the water supply, among other damages. The Company has not manufactured 1,4 dioxane since 2008, denies the allegations related to liability for the plaintiff's claims, and is vigorously defending this proceeding. In March 2018, the defendants, including the Company, filed a motion to dismiss the complaint, which was heard by the court in June 2018. The Company currently does not expect the outcome of this proceeding to have a material adverse impact on its consolidated financial condition, results of operations, or cash flows, net of any insurance coverage. However, it is not possible to predict the ultimate outcome of this proceeding due to the unpredictable nature of litigation.

In addition to the proceeding described above, the Company and its consolidated subsidiaries are subject from time to time to various claims, lawsuits, investigations, and proceedings related to products, services, contracts, environmental, health and safety, employment, intellectual property, and other matters, including with respect to divested businesses. The outcome of such matters is unpredictable, our assessment of them may change, and resolution of them could have a material adverse effect on the Company's

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consolidated financial position, results of operations, or cash flows. We do not currently expect the resolution of such matters to materially affect the consolidated financial position, results of operations, or cash flows of the Company.

## 12. Retirement Benefits

Net periodic benefit (credit) cost of our U.S. pension plans (including our unfunded nonqualified plans), non-U.S. pension plans, and postretirement health care and life insurance benefit plans for the three months ended September 30, 2018 and 2017, respectively, follow:

	U.S. Pension Plans		Non-U.S. Pension Plans		Other Benefit Plans	
	2018	2017	2018	2017	2018	2017
	Three Months Ended September 30,					
	(Dollars in thousands)					
Service cost	\$ 3	\$ 4	\$ 436	\$ 432	\$ 1	\$ —
Interest cost	2,788	3,666	653	621	183	211
Expected return on plan assets	(3,995)	(4,740)	(222)	(227)	—	—
Amortization of prior service cost	—	2	10	11	—	—
Net periodic benefit (credit) cost	\$ (1,204)	\$ (1,068)	\$ 877	\$ 837	\$ 184	\$ 211

Net periodic benefit (credit) cost for the nine months ended September 30, 2018 and 2017, respectively, follow:

	U.S. Pension Plans		Non-U.S. Pension Plans		Other Benefit Plans	
	2018	2017	2018	2017	2018	2017
	Nine Months Ended September 30,					
	(Dollars in thousands)					
Service cost	\$ 9	\$ 13	\$ 1,344	\$ 1,259	\$ 2	\$ —
Interest cost	8,363	10,997	2,009	1,801	549	632



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Expected return on plan assets	(11,984)	(14,218)	(681)	(659)	—	—
Amortization of prior service cost	—	5	32	33	—	—
Net periodic benefit (credit) cost	\$ (3,612)	\$ (3,203)	\$ 2,704	\$ 2,434	\$ 551	\$ 632

Interest cost, expected return on plan assets and amortization of prior service cost are recorded in Miscellaneous expense (income), net on the condensed consolidated statement of operations.

### 13. Stock-Based Compensation

On May 3, 2018, our shareholders approved the 2018 Omnibus Incentive Plan (the “Plan”), which was adopted by the Board of Directors on February 22, 2018, subject to shareholder approval. The Plan’s purpose is to promote the Company’s long-term financial interests and growth by attracting, retaining and motivating high-quality key employees and directors, motivating such employees and directors to achieve the Company’s short- and long-range performance goals and objectives, and thereby align their interests with those of the Company’s shareholders. The Plan reserves 4,500,000 shares of common stock to be issued for grants of several different types of long-term incentives including stock options, stock appreciation rights, restricted awards, performance awards, other common stock-based awards, and dividend equivalent rights.

The 2013 Omnibus Incentive Plan (the “Previous Plan”), was replaced by the Plan, and no future grants may be made under the Previous Plan. However, any outstanding awards or grants made under the Previous Plan will continue until the end of their specified terms.

In the first nine months of 2018, our Board of Directors granted 0.2 million stock options, 0.1 million performance share units, and 0.1 million restricted stock units.

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We estimate the fair value of each stock option on the date of grant using the Black-Scholes option pricing model. The following table details the weighted-average grant-date fair values and the assumptions used for estimating the fair values of stock option grants made during the nine months ended September 30, 2018:

	Stock Options
Weighted-average grant-date fair value	\$ 8.91
Expected life, in years	5.4
Risk-free interest rate	2.7 %
Expected volatility	39.7 %

The weighted average grant date fair value of our performance share units granted in the nine months ended September 30, 2018, was \$22.92. We measure the fair value of performance share units based on the closing market price of our common stock on the date of the grant. These shares are evaluated each reporting period for respective attainment rates against the performance criteria.

The weighted-average grant date fair value per unit for grants made during the nine months ended September 30, 2018, was \$22.27. We measure the fair value of restricted share units based on the closing market price of our common stock on the date of the grant. The restricted share units vest over three years.

We recognized stock-based compensation expense of \$1.4 million and \$5.2 million for the three and nine months ended September 30, 2018, respectively, and \$1.5 million and \$6.9 million for three and nine months ended September 30, 2017. At September 30, 2018, unearned compensation cost related to the unvested portion of all stock-based compensation awards was approximately \$7.7 million and is expected to be recognized over the remaining vesting period of the respective grants, through the first quarter of 2021.

#### 14. Restructuring and Optimization Programs

Total restructuring and impairment charges were \$2.6 million and \$10.4 million for the three and nine months ended September 30, 2018, respectively, and \$1.5 million and \$7.7 million for the three and nine months ended September 30, 2017, respectively. Included in the charges for the nine months ended September 30, 2017, was an impairment charge of \$1.5 million related to an equity method investment. The remainder of the charges primarily relate to costs associated with integration of our recent acquisitions and optimization programs, and are further summarized below.

	Employee Severance	Other Costs	Total
	(Dollars in thousands)		
Balances at December 31, 2017	\$ 2,286	\$ 1,234	\$ 3,520
Restructuring charges	4,711	5,724	10,435
Cash payments	(5,283)	(875)	(6,158)
Non-cash items	(125)	(4,253)	(4,378)
Balances at September 30, 2018	\$ 1,589	\$ 1,830	\$ 3,419

We expect to make cash payments to settle the remaining liability for employee severance benefits and other costs over the next twelve months, except where legal or contractual obligations would require it to extend beyond that period.

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## 15. Earnings Per Share

Details of the calculation of basic and diluted earnings per share are shown below:

	Three Months Ended September 30,		Nine Months Ended September 30,	
	2018	2017	2018	2017
	(Dollars in thousands, except per share amounts)			
Basic earnings per share computation:				
Net income attributable to Ferro Corporation common shareholders	\$ 16,058	\$ 22,817	\$ 69,117	\$ 65,740
Weighted-average common shares outstanding	83,893	83,735	84,154	83,646
Basic earnings per share attributable to Ferro Corporation common shareholders	\$ 0.19	\$ 0.27	\$ 0.82	\$ 0.79
Diluted earnings per share computation:				
Net income attributable to Ferro Corporation common shareholders	\$ 16,058	\$ 22,817	\$ 69,117	\$ 65,740
Weighted-average common shares outstanding	83,893	83,735	84,154	83,646
Assumed exercise of stock options	788	808	811	671
Assumed satisfaction of restricted stock unit conditions	289	424	281	383
Assumed satisfaction of performance share unit conditions	192	483	182	474
Weighted-average diluted shares outstanding	85,162	85,450	85,428	85,174
Diluted earnings per share attributable to Ferro Corporation common shareholders	\$ 0.19	\$ 0.27	\$ 0.81	\$ 0.77

The number of anti-dilutive or unearned shares was 1.7 million and 1.7 million for the three and nine months ended September 30, 2018, respectively, and 1.6 million and 1.8 million for the three and nine months ended September 30, 2017. These shares were excluded from the calculation of diluted earnings per share due to their anti-dilutive impact.

## 16. Share Repurchase Program

The Company's Board of Directors has approved \$50 million of a share repurchase program, under which the Company is authorized to repurchase the Company's outstanding shares of Common Stock on the open market, including through a Rule 10b5-1 plan, or in privately negotiated transactions.

The timing and amount of shares to be repurchased will be determined by the Company, based on evaluation of market and business conditions, share price, and other factors. The share repurchase program does not obligate the

Company to repurchase any dollar amount or number of common shares, and may be suspended or discontinued at any time.

For the nine months ended September 30, 2018, the Company repurchased 807,816 shares of common stock at an average price of \$21.04 per share for a total cost of \$17.0 million. As of September 30, 2018, \$33.0 million could still be purchased under the program.

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## 17. Accumulated Other Comprehensive Loss

Changes in accumulated other comprehensive income (loss) by component, net of tax, were as follows:

	Three Months Ended September 30,			
	Postretirement Benefit Liability Adjustments (Dollars in thousands)	Translation Adjustments	Net Gain on Cash Flow Hedges	Total
Balances at June 30, 2017	\$ 1,153	\$ (86,823)	\$ —	\$ (85,670)
Other comprehensive loss before reclassifications, before tax	—	(141)	—	(141)
Reclassification to earnings:				
Postretirement benefit liabilities loss, before tax	(39)	—	—	(39)
Cash flow hedge income, before tax	—	—	166	166
Current period other comprehensive (loss) income, before tax	(39)	(141)	166	(14)
Tax effect	(6)	3,001	62	3,057
Current period other comprehensive (loss) income, net of tax	(33)	(3,142)	104	(3,071)
Balances at September 30, 2017	\$ 1,120	\$ (89,965)	\$ 104	\$ (88,741)
Balances at June 30, 2018	\$ 1,182	\$ (101,927)	\$ 923	\$ (99,822)
Other comprehensive (loss) income before reclassifications, before tax	—	(5,086)	6,644	1,558
Reclassification to earnings:				
Cash flow hedge loss, before tax	—	—	(3,548)	(3,548)
Current period other comprehensive (loss) income, before tax	—	(5,086)	3,096	(1,990)
Tax effect	—	94	(514)	(420)
Current period other comprehensive (loss) income, net of tax	—	(5,180)	3,610	(1,570)
Balances at September 30, 2018	\$ 1,182	\$ (107,107)	\$ 4,533	\$ (101,392)

	Nine Months Ended September 30,			
	Postretirement Benefit Liability Adjustments	Translation Adjustments	Net Gain on Cash Flow Hedges	Total

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(Dollars in thousands)

Balances at December 31, 2016	\$ 1,141	\$ (107,784)	\$ —	\$ (106,643)
Other comprehensive income before reclassifications, before tax	—	20,820	—	20,820
Reclassification to earnings:				
Postretirement benefit liabilities loss, before tax	(30)	—	—	(30)
Cash flow hedge income, before tax	—	—	166	166
Current period other comprehensive (loss) income, before tax	(30)	20,820	166	20,956
Tax effect	(9)	3,001	62	3,054
Current period other comprehensive (loss) income, net of tax	(21)	17,819	104	17,902
Balances at September 30, 2017	\$ 1,120	\$ (89,965)	\$ 104	\$ (88,741)
Balances at December 31, 2017	\$ 1,165	\$ (77,578)	\$ 945	\$ (75,468)
Other comprehensive (loss) income before reclassifications, before tax	—	(29,107)	18,473	(10,634)
Reclassification to earnings:				
Postretirement benefit liabilities income, before tax	22	—	—	22
Cash flow hedge loss, before tax	—	—	(15,235)	(15,235)
Current period other comprehensive income (loss), before tax	22	(29,107)	3,238	(25,847)
Tax effect	5	422	(350)	77
Current period other comprehensive income (loss), net of tax	17	(29,529)	3,588	(25,924)
Balances at September 30, 2018	\$ 1,182	\$ (107,107)	\$ 4,533	\$ (101,392)

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## 18. Reporting for Segments

Net sales to external customers by segment are presented in the table below. Sales between segments were not material.

	Three Months Ended		Nine Months Ended	
	September 30,		September 30,	
	2018	2017	2018	2017
	(Dollars in thousands)			
Performance Coatings	\$ 175,939	\$ 146,238	\$ 554,036	\$ 424,549
Performance Colors and Glass	123,277	110,578	369,809	320,733
Color Solutions	95,947	93,196	293,089	273,917
Total net sales	\$ 395,163	\$ 350,012	\$ 1,216,934	\$ 1,019,199

Each segment's gross profit and reconciliations to income before income taxes are presented in the table below:

	Three Months Ended		Nine Months Ended	
	September 30,		September 30,	
	2018	2017	2018	2017
	(Dollars in thousands)			
Performance Coatings	\$ 36,257	\$ 35,470	\$ 130,319	\$ 109,205
Performance Colors and Glass	40,095	37,880	128,785	115,385



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Color Solutions	30,174	31,044	93,864	87,642
Other cost of sales	(1,039)	(778)	(2,150)	(1,480)
Total gross profit	105,487	103,616	350,818	310,752
Selling, general and administrative expenses	64,344	65,941	207,560	188,368
Restructuring and impairment charges	2,561	1,471	10,435	7,713
Other expense, net	11,071	5,886	33,975	25,170
Income before income taxes	\$ 27,511	\$ 30,318	\$ 98,848	\$ 89,501

## 19. Subsequent Events

On October 1, 2018, the Company acquired 100% of the equity interests of Quimicer, S.A. for €27.8 million (approximately \$32.2 million), excluding customary adjustments and fees.

The operating results related to the Quimicer, S.A. acquisition will be included in the Company's condensed consolidated financial statements commencing on the date of the acquisition.

Due to the timing of the acquisition, the Company's initial purchase price accounting was incomplete at the time these financial statements were issued. As such, the Company cannot disclose the allocation of the acquisition price to acquired assets and liabilities and the related disclosures at this time.

In October 2018, the Company's Board of Directors approved a new share repurchase program under which the Company is authorized to repurchase up to an additional \$50 million of the Company's outstanding common stock on the open market, including through Rule 10b5-1 plans, in privately negotiated transactions, or otherwise.



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Item 2. Management's Discussion and Analysis of Financial Condition and Results of Operations

Overview

Net sales for the three months ended September 30, 2018, increased by \$45.2 million, or 12.9%, compared with the prior-year same period. The increase in net sales was driven by higher sales in Performance Coatings, Performance Colors and Glass and Color Solutions of \$29.7 million, \$12.7 million and \$2.8 million, respectively. During the three months ended September 30, 2018, gross profit increased \$1.9 million, or 1.8%, compared with the prior-year same period; as a percentage of net sales, it decreased approximately 290 basis points to 26.7%. Our total gross profit for the third quarter of 2018 was \$105.5 million, compared with \$103.6 million for the three months ended September 30, 2017. The increase in gross profit was attributable to increases in Performance Colors and Glass and Performance Coatings of \$2.2 million and \$0.8 million, respectively, partially offset by a decrease in Color Solutions of \$0.9 million.

For the three months ended September 30, 2018, selling, general and administrative ("SG&A") expenses decreased \$1.6 million, or 2.4%, compared with the prior-year same period. As a percentage of net sales, it decreased approximately 260 basis points to 16.3%. The lower SG&A expenses compared to the prior-year same period are primarily driven by a decrease in incentive compensation, partially offset by greater expenses associated with businesses acquired within the last year.

For the three months ended September 30, 2018, net income was \$16.1 million, compared with net income of \$23.0 million for the prior-year same period, and net income attributable to common shareholders was \$16.1 million, compared with net income attributable to common shareholders of \$22.8 million for the prior-year same period.

Outlook

We expect to continue to execute the dynamic innovation and optimization phase of our value creation strategy and remain focused on driving toward our Vision 2020 goals. We expect organic growth to be driven by sales of new products and technical services oriented to the higher end of our target markets. We expect to invest approximately \$100 million to \$150 million per year in strategic investments, while we remain focused on integrating recent acquisitions and achieving identified synergies. We also are implementing and executing optimization programs to improve efficiency and upgrade operations throughout our business.

The Company expects gross margins to rebound in the fourth quarter, as raw material prices decrease and Ferro pricing is expected to more than offset raw material headwinds for the first time since early 2017. Management believes that actions taken in the third quarter of 2018 reinforced the Company's ability to deliver its Vision 2020 goals, even if macroeconomic circumstances become more challenging.

Foreign currency rates may continue to be volatile through the fourth quarter of 2018 and changes in interest rates could adversely impact reported results. We expect cash flow from operating activities to be positive for 2018, providing additional liquidity.

Factors that could adversely affect our future performance include those described under the heading “Risk Factors” in Item 1A of Part I of our Annual Report on Form 10-K for the year ended December 31, 2017.

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## Results of Operations - Consolidated

## Comparison of the three months ended September 30, 2018 and 2017

For the three months ended September 30, 2018, net income was \$16.1 million, compared with net income of \$23.0 million for the three months ended September 30, 2017. For the three months ended September 30, 2018, net income attributable to common shareholders was \$16.1 million, or earnings per share of \$0.19, compared with net income attributable to common shareholders of \$22.8 million, or earnings per share of \$0.27, for the three months ended September 30, 2017.

## Net Sales

	Three Months Ended September 30,		\$ Change	% Change
	2018	2017		
	(Dollars in thousands)			
Net sales	\$ 395,163	\$ 350,012	\$ 45,151	12.9 %
Cost of sales	289,676	246,396	43,280	17.6 %
Gross profit	\$ 105,487	\$ 103,616	\$ 1,871	1.8 %
Gross profit as a % of net sales	26.7 %	29.6 %		

Net sales increased by \$45.2 million, or 12.9%, for the three months ended September 30, 2018, compared with the prior-year same period, driven by higher sales in Performance Coatings, Performance Colors and Glass and Color Solutions of \$29.7 million, \$12.7 million and \$2.8 million, respectively. The increase in net sales was driven in part by acquisitions, including Endeka, which contributed sales of \$25.6 million, and was acquired after the third quarter of 2017. The increase in net sales was also driven by organic growth, with Performance Colors and Glass growing \$9.3 million, Performance Coatings growing \$3.0 million and Color Solutions growing \$1.8 million.

## Gross Profit

Gross profit increased \$1.9 million, or 1.8%, for the three months ended September 30, 2018, compared with the prior-year same period, and as a percentage of net sales, it decreased 290 basis points to 26.7%. The increase in gross profit was attributable to increases in Performance Colors and Glass and Performance Coatings of \$2.2 million and \$0.8 million, respectively, partially offset by a decrease in Color Solutions of \$0.9 million. The increase in gross profit was driven by favorable product pricing of \$8.9 million, higher sales volumes and mix of \$5.5 million and gross

profit from acquisitions of \$5.1 million, partially offset by higher raw material costs of \$10.8 million, higher manufacturing costs of \$4.5 million and unfavorable foreign currency impacts of \$2.1 million.

### Geographic Revenues

The following table presents our sales on the basis of where sales originated.

	Three Months Ended September 30,			% Change
	2018	2017	\$ Change	
(Dollars in thousands)				
Geographic Revenues on a sales origination basis				
EMEA	\$ 199,319	\$ 169,718	\$ 29,601	17.4 %
United States	98,956	88,391	10,565	12.0 %
Asia Pacific	56,614	50,864	5,750	11.3 %
Latin America	40,274	41,039	(765)	(1.9) %
Net sales	\$ 395,163	\$ 350,012	\$ 45,151	12.9 %

The increase in net sales of \$45.2 million, compared with the prior-year same period, was driven by an increase in sales from EMEA, the United States and Asia Pacific. The increase in sales from EMEA was attributable to higher sales in Performance Coatings and Performance Colors and Glass of \$26.4 million and \$3.4 million, respectively, partially offset by a decrease in sales in Color Solutions of \$0.1 million. The increase in sales from Asia Pacific was attributable to higher sales in Performance Coatings,

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Performance Colors and Glass and Color Solutions of \$3.7 million, \$1.9 million and \$0.2 million, respectively. The increase in sales from the United States was attributable to higher sales in Performance Colors and Glass, Color Solutions and Performance Coatings of \$7.3 million \$2.5 million and \$0.8 million, respectively. The decrease in sales from Latin America was attributable to lower sales in Performance Coatings of \$1.1 million, partially mitigated by an increase in sales from Performance Colors and Glass and Color Solutions of \$0.2 million and \$0.2 million, respectively.

The following table presents our sales on the basis of where sold products were shipped.

	Three Months Ended September 30,			
	2018	2017	\$ Change	% Change
Geographic Revenues on a shipped-to basis				
EMEA	\$ 188,112	\$ 161,764	\$ 26,348	16.3 %
Asia Pacific	88,991	75,274	13,717	18.2 %
United States	71,333	65,356	5,977	9.1 %
Latin America	46,727	47,618	(891)	(1.9) %
Net sales	\$ 395,163	\$ 350,012	\$ 45,151	12.9 %

## Selling, General and Administrative Expenses

The following table includes SG&A components with significant changes between 2018 and 2017.

	Three Months Ended September 30,			
	2018	2017	\$ Change	% Change
Personnel expenses	\$ 38,245	\$ 36,364	\$ 1,881	5.2 %
Incentive compensation	(489)	3,637	(4,126)	(113.4) %



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Stock-based compensation	1,361	1,510	(149)	(9.9)	%
Pension and other postretirement benefits	328	436	(108)	(24.8)	%
Bad debt	(64)	289	(353)	(122.1)	%
Business development	4,261	4,649	(388)	(8.3)	%
Research and development expenses	9,159	9,698	(539)	(5.6)	%
Intangible asset amortization	2,042	2,898	(856)	(29.5)	%
All other expenses	9,501	6,460	3,041	47.1	%
Selling, general and administrative expenses	\$ 64,344	\$ 65,941	\$ (1,597)	(2.4)	%

SG&A expenses were \$1.6 million lower in the three months ended September 30, 2018, compared with the prior-year same period. The lower SG&A expenses compared to the prior-year same period are primarily driven by a decrease in incentive compensation, partially offset by greater expenses associated with businesses acquired within the last year.

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The following table presents SG&A expenses attributable to sales, research and development and operations costs as strategic services and other SG&A costs as functional services.

	Three Months Ended September 30,			
	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Strategic services	\$ 37,084	\$ 34,408	\$ 2,676	7.8 %
Functional services	26,388	26,386	2	0.0 %
Incentive compensation	(489)	3,637	(4,126)	(113.4) %
Stock-based compensation	1,361	1,510	(149)	(9.9) %
Selling, general and administrative expenses	\$ 64,344	\$ 65,941	\$ (1,597)	(2.4) %

## Restructuring and Impairment Charges

	Three Months Ended September 30,			
	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Employee severance	\$ 1,278	\$ 660	\$ 618	93.6 %
Other restructuring costs	1,283	811	472	58.2 %
Restructuring and impairment charges	\$ 2,561	\$ 1,471	\$ 1,090	74.1 %

Restructuring and impairment charges increased in the third quarter of 2018 compared with the prior-year same period. The increase primarily relates to costs associated with integration of our recent acquisitions and optimization programs.

## Interest Expense

	Three Months Ended September 30,			
	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Interest expense	\$ 8,632	\$ 6,326	\$ 2,306	36.5 %
Amortization of bank fees	911	943	(32)	(3.4) %
Interest swap amortization	(316)	—	(316)	— %
Interest capitalization	(674)	(21)	(653)	NM %
Interest expense	\$ 8,553	\$ 7,248	\$ 1,305	18.0 %

Interest expense increased in the third quarter of 2018 compared with the prior-year same period. The increase in interest expense was due to an increase in the average long-term debt balance during the three months ended September 30, 2018, compared with the prior-year same period and an increase in LIBOR, offset by the decrease in the applicable margin rate from borrowing from the Amended Credit Facility.

#### Income Tax Expense

During the third quarter of 2018, income tax expense was \$11.4 million, or 41.3% of pre-tax income. In the third quarter of 2017, we recorded tax expense of \$7.4 million, or 24.3% of pre-tax income. The tax expense in the third quarter of 2018, as a percentage of pre-tax income, is higher than the U.S. federal statutory income tax rate of 21% primarily as a result of foreign statutory rate differences and discrete items recorded in the period. The discrete items recorded in the quarter primarily include a reduction to the tax expense related to the provision to return adjustments and an increase from the impact of resolving a foreign tax audit. The tax expense for the third quarter of 2017, as a percentage of pre-tax income, is lower than the U.S. federal statutory income tax rate of 35% primarily as a result of foreign statutory rate differences.

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We have recognized the provisional tax impacts related to the 2017 Tax Cut and Jobs Act (the “Tax Act”) under the guidance of the SEC Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (“SAB 118”). The ultimate impact may differ from these provisional amounts due to additional analysis, changes in interpretations and assumptions, additional regulatory guidance that may be issued, and actions we may take as a result of the Tax Act. The Company’s preliminary determinations related to the estimable impacts of the Tax Act that are effective for the year ended December 31, 2017 have not changed in the current quarter.

The Company continues to review the anticipated impacts of the global intangible low taxed income (“GILTI”) and the foreign-derived intangible income (“FDII”) on the Company for 2018. For the current quarter the company has made reasonable estimates of GILTI and FDII, as well as the impact of changes to valuation allowances related to certain positions. The combined provisional net impact of these items are not anticipated to be material to the tax rate in 2018. The Company has not recorded any potential deferred tax effects related to GILTI in the financial statements and has not made a policy decision regarding whether to record deferred taxes on GILTI or use the period cost method.

## Results of Operations - Segment Information

Comparison of the three months ended September 30, 2018 and 2017

## Performance Coatings

	Three Months Ended			%	Change due to				
	September 30,				Price	Mix	Currency	Acquisition	Other
	2018	2017	\$ Change	Change					
	(Dollars in thousands)								
Segment net sales	\$ 175,939	\$ 146,238	\$ 29,701	20.3 %	\$ 5,741	\$ 4,013	\$ (6,797)	\$ 26,744	\$ —
Segment gross profit	36,257	35,470	787	2.2 %	5,741	462	(1,059)	4,189	(8,545)
Gross profit as a % of segment net sales	20.6 %	24.3 %							

Net sales increased in Performance Coatings compared with the prior-year same period, primarily driven by sales from Endeka of \$25.3 million and FMU of \$1.0 million, each of which was acquired after the third quarter of 2017, and increases in sales of frits and glazes and digital inks of \$2.8 million and \$0.8 million, respectively. The increase in net sales was driven by sales from acquisitions of \$26.7 million, higher product pricing of \$5.7 million and favorable volume and mix of \$4.0 million, partially offset by unfavorable foreign currency impacts of \$6.8 million. Gross profit increased \$0.8 million from the prior-year same period, primarily driven by favorable product pricing impacts of \$5.7 million, gross profit from acquisitions of \$4.2 million and higher sales volume and mix of \$0.5 million, partially offset by higher raw material costs of \$8.1 million, unfavorable foreign currency impacts of \$1.1 million and higher manufacturing costs of \$0.4 million.

	Three Months Ended September 30,		\$ Change	% Change
	2018	2017		
Segment net sales by Region	(Dollars in thousands)			
EMEA	\$ 110,261	\$ 83,910	\$ 26,351	31.4 %
Latin America	25,594	26,699	(1,105)	(4.1) %
Asia Pacific	27,914	24,264	3,650	15.0 %
United States	12,170	11,365	805	7.1 %
Total	\$ 175,939	\$ 146,238	\$ 29,701	20.3 %

The net sales increase of \$29.7 million was driven by increases in sales in EMEA, Asia Pacific, and the United States, partially offset by a decrease in sales in Latin America. The increase in sales from EMEA was primarily attributable to sales from Endeka and

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Gardenia, which contributed \$24.7 million and \$0.4 million, respectively, and higher sales of frits and glazes and porcelain enamel of \$2.9 million and \$0.6 million, respectively, partially offset by a decrease in sales of colors of \$2.7 million. The increase in sales from Asia Pacific was driven by higher sales of frits and glazes and digital inks of \$1.4 million and \$0.7 million, respectively, and sales from FMU and Endeka, which contributed \$1.0 million and \$0.7 million, respectively. The increase in sales from the United States was fully attributable to higher sales of porcelain enamel. The decrease in sales from Latin America was primarily driven by lower sales of frits and glazes and porcelain enamel of \$1.5 million and \$0.8 million, respectively, partially mitigated by an increase in sales of digital inks and opacifiers of \$0.6 million and \$0.6 million, respectively.

## Performance Colors and Glass

	Three Months Ended September 30,		\$ Change	% Change	Change due to Volume /				
	2018	2017			Price	Mix	Currency	Acquisition	Other
Segment net sales	\$ 123,277	\$ 110,578	\$ 12,699	11.5 %	\$ 1,077	\$ 10,175	\$ (1,969)	\$ 3,417	\$ —
Segment gross profit	40,095	37,880	2,215	5.8 %	1,077	2,268	(629)	751	(1,251)
Gross profit as a % of segment net sales	32.5 %	34.3 %							

Net sales increased compared with the prior-year same period, primarily driven by organic sales of \$9.3 million and \$1.3 million in sales from Dip-Tech, which was acquired in the third quarter of 2017, and \$1.3 million in sales from MRA, which was acquired in the third quarter of 2018. The increase in net sales was driven by favorable volume and mix of \$10.2 million, sales from acquisitions of \$3.4 million and higher product pricing of \$1.1 million, partially offset by unfavorable foreign currency impacts of \$2.0 million. Gross profit increased from the prior-year same period, primarily due to favorable volume and mix of \$2.3 million, higher product pricing of \$1.1 million and higher gross profit from acquisitions of \$0.8 million, partially offset by higher raw material costs of \$1.0 million, unfavorable foreign currency impacts of \$0.6 million and unfavorable manufacturing costs of \$0.3 million.

Three Months Ended  
September 30,

	2018	2017	\$ Change	% Change
Segment net sales by Region				
EMEA	\$ 55,782	\$ 52,408	\$ 3,374	6.4 %
United States	43,087	35,836	7,251	20.2 %
Asia Pacific	18,564	16,663	1,901	11.4 %
Latin America	5,844	5,671	173	3.1 %
Total	\$ 123,277	\$ 110,578	\$ 12,699	11.5 %

The net sales increase of \$12.7 million was driven by higher sales from all regions. The increase in sales from the United States was primarily attributable to an increase in sales of electronics products and decoration products of \$3.9 million and \$1.0 million, respectively, and increased sales from Dip-Tech and MRA of \$1.3 million and \$1.3 million, respectively, partially offset by lower sales of industrial products. The increase in sales from EMEA was primarily attributable to higher sales of electronic products and decorations products of \$3.4 million and \$1.5 million, respectively, partially offset by lower sales from Dip-Tech of \$1.1 million. The increase from Asia Pacific was primarily due to an increase in sales of automobile products of \$1.2 million and sales from Dip-Tech of \$1.0 million. Sales from Latin America remained relatively flat.

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## Color Solutions

	Three Months Ended				Change due to					
	September 30,				Volume					
	2018	2017	\$ Change	% Change	Price	Mix	Currency	Acquisition	Other	
	(Dollars in thousands)									
Segment net sales	\$ 95,947	\$ 93,196	\$ 2,751	3.0 %	\$ 2,123	\$ 1,110	\$ (1,443)	\$ 961	\$ —	
Segment gross profit	30,174	31,044	(870)	(2.8) %	2,123	2,794	(412)	186	(5,562)	
Gross profit as a % of segment net sales	31.4 %	33.3 %								

Net sales increased compared with the prior-year same period, primarily due to higher sales of surface technology products and sales from Diegel of \$1.9 million and \$1.0 million, respectively. The increase in net sales was driven by higher product pricing of \$2.1 million, higher volume and mix of \$1.1 million, and sales from acquisitions of \$1.0 million, partially offset by unfavorable foreign currency impacts of \$1.4 million. Gross profit decreased from the prior-year same period, primarily due higher manufacturing costs of \$3.8 million, higher raw material costs of \$1.7 million and unfavorable foreign currency impacts of \$0.4 million, partially mitigated by favorable sales volume and mix of \$2.8 million, higher product pricing of \$2.1 million and gross profit from acquisitions of \$0.2 million.

Segment net sales by Region	Three Months Ended			
	September 30,			
	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
United States	\$ 43,699	\$ 41,190	\$ 2,509	6.1 %
EMEA	33,276	33,400	(124)	(0.4) %
Asia Pacific	10,136	9,937	199	2.0 %
Latin America	8,836	8,669	167	1.9 %
Total	\$ 95,947	\$ 93,196	\$ 2,751	3.0 %



The net sales increase of \$2.8 million was driven by higher sales from the United States. The increase in sales from the United States was primarily driven by higher sales of surface technology and pigment products of \$1.9 million and \$0.5 million, respectively. Sales from Asia Pacific and Latin America remained primarily flat. The decrease in sales in EMEA was primarily attributable to lower sales of pigment products of \$1.1 million, partially mitigated by sales from Diegel of \$0.9 million.

Comparison of the nine months ended September 30, 2018 and 2017

For the nine months ended September 30, 2018, net income was \$69.6 million, compared with net income of \$66.3 million for the nine months ended September 30, 2017. For the nine months ended September 30, 2018, net income attributable to common shareholders was \$69.1 million, or earnings per share of \$0.82, compared with net income attributable to common shareholders of \$65.7 million, or earnings per share of \$0.79, for the nine months ended September 30, 2017.

Net Sales

	Nine Months Ended September 30,		\$ Change	% Change
	2018	2017		
	(Dollars in thousands)			
Net sales	\$ 1,216,934	\$ 1,019,199	\$ 197,735	19.4 %
Cost of sales	866,116	708,447	157,669	22.3 %
Gross profit	\$ 350,818	\$ 310,752	\$ 40,066	12.9 %
Gross profit as a % of net sales	28.8 %	30.5 %		

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Net sales increased by \$197.7 million, or 19.4%, in the nine months ended September 30, 2018, compared with the prior-year same period, driven by higher sales in Performance Coatings, Performance Colors and Glass and Color Solutions of \$129.5 million, \$49.1 million and \$19.2 million, respectively. The increase in net sales was driven by Endeka, which contributed sales of \$86.8 million, and Dip-Tech, which contributed sales of \$12.2 million. The increase in net sales was also driven by organic growth, with Performance Coatings growing \$32.1 million, Performance Colors and Glass growing \$30.5 million and Color Solutions growing \$18.2 million.

## Gross Profit

Gross profit increased \$40.1 million, or 12.9%, in the nine months ended September 30, 2018, compared with the prior-year same period, and as a percentage of net sales, it decreased 170 basis points to 28.8%. The increase in gross profit was attributable to increases across all segments, with increases in Performance Coatings, Performance Colors and Glass and Color Solutions of \$21.1 million, \$13.4 million and \$6.2 million, respectively. The increase in gross profit was driven by favorable product pricing of \$33.0 million, gross profit from acquisitions of \$28.4 million, higher sales volumes and mix of \$11.6 million, favorable foreign currency impacts of \$8.6 million and lower manufacturing costs of \$2.3 million, partially offset by higher raw material costs of \$43.1 million.

## Geographic Revenues

The following table presents our sales on the basis of where sales originated.

	Nine Months Ended September 30,			% Change
	2018	2017	\$ Change	
(Dollars in thousands)				
Geographic Revenues on a sales origination basis				
EMEA	\$ 646,296	\$ 490,008	\$ 156,288	31.9 %
United States	281,984	265,385	16,599	6.3 %
Asia Pacific	166,738	142,732	24,006	16.8 %
Latin America	121,916	121,074	842	0.7 %
Net sales	\$ 1,216,934	\$ 1,019,199	\$ 197,735	19.4 %

The increase in net sales of \$197.7 million, compared with the prior-year same period, was driven by an increase in sales from all regions. The increase in sales from EMEA was primarily attributable to higher sales in Performance Coatings, Performance Colors and Glass and Color Solutions of \$113.6 million, \$36.2 million and \$6.4 million, respectively. The increase in sales from Asia Pacific was primarily attributable to higher sales in Performance Coatings, Performance Colors and Glass and Color Solutions of \$14.3 million, \$6.1 million and \$3.6 million, respectively. The increase in sales from the United States was attributable to higher sales in Color Solutions, Performance Colors and Glass and Performance Coatings of \$7.7 million, \$5.9 million and \$3.0 million, respectively. The increase in sales from Latin America was attributable to higher sales in Color Solutions and Performance Colors and Glass of \$1.4 million and \$0.9 million, respectively, partially offset by a decrease in sales in Performance Coatings of \$1.4 million.

The following table presents our sales on the basis of where sold products were shipped.

	Nine Months Ended September 30,			
	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Geographic Revenues on a shipped-to basis				
EMEA	\$ 611,532	\$ 464,872	\$ 146,660	31.5 %
Asia Pacific	253,975	220,095	33,880	15.4 %
United States	209,707	197,135	12,572	6.4 %
Latin America	141,720	137,097	4,623	3.4 %
Net sales	\$ 1,216,934	\$ 1,019,199	\$ 197,735	19.4 %

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## Selling, General and Administrative Expenses

The following table includes SG&A components with significant changes between 2018 and 2017.

	Nine Months Ended September 30,			
	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Personnel expenses	\$ 121,073	\$ 102,872	\$ 18,201	17.7 %
Incentive compensation	5,008	7,932	(2,924)	(36.9) %
Stock-based compensation	5,217	6,901	(1,684)	(24.4) %
Pension and other postretirement benefits	1,009	1,272	(263)	(20.7) %
Bad debt	430	(78)	508	(651.3) %
Business development	9,897	11,260	(1,363)	(12.1) %
Research and development expenses	30,263	26,488	3,775	14.3 %
Intangible asset amortization	6,126	7,037	(911)	(12.9) %
All other expenses	28,537	24,684	3,853	15.6 %
Selling, general and administrative expenses	\$ 207,560	\$ 188,368	\$ 19,192	10.2 %

SG&A expenses were \$19.2 million higher in the nine months ended September 30, 2018, compared with the prior-year same period. The higher SG&A expenses compared with the prior-year same period are primarily driven by businesses acquired within the last year, primarily related to personnel expenses and research and development expenses.

The following table presents SG&A expenses attributable to sales, research and development and operations costs as strategic services and other SG&A costs as functional services.

Nine Months Ended  
September 30,

	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Strategic services	\$ 117,905	\$ 99,081	\$ 18,824	19.0 %
Functional services	79,430	74,454	4,976	6.7 %
Incentive compensation	5,008	7,932	(2,924)	(36.9)%
Stock-based compensation	5,217	6,901	(1,684)	(24.4)%
Selling, general and administrative expenses	\$ 207,560	\$ 188,368	\$ 19,192	10.2 %

Restructuring and Impairment Charges

Nine Months Ended  
September 30,

	2018	2017	\$ Change	% Change
	(Dollars in thousands)			
Employee severance	\$ 4,710	\$ 2,455	\$ 2,255	91.9 %
Equity method investment impairment	—	1,499	(1,499)	— %
Asset impairment	—	1,176	(1,176)	— %
Other restructuring costs	5,725	2,583	3,142	121.6 %
Restructuring and impairment charges	\$ 10,435	\$ 7,713	\$ 2,722	35.3 %

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Restructuring and impairment charges increased in the nine months ended September 30, 2018 compared with the prior-year same period. The increase primarily relates to costs associated with integration of our recent acquisitions and optimization programs.

## Interest Expense

	Nine Months Ended September 30,				
	2018	2017	\$ Change	% Change	
	(Dollars in thousands)				
Interest expense	\$ 23,582	\$ 17,591	\$ 5,991	34.1	%
Amortization of bank fees	2,684	2,375	309	13.0	%
Interest swap amortization	(447)	—	(447)	—	%
Interest capitalization	(1,104)	(45)	(1,059)	2,353.3	%
Interest expense	\$ 24,715	\$ 19,921	\$ 4,794	24.1	%

Interest expense increased in the nine months ended September 30, 2018 compared with the prior-year same period. The increase in interest expense was due to an increase in the average long-term debt balance during the nine months ended September 30, 2018, compared with the prior-year same period. Also, interest expense increased due to the increase in LIBOR, offset by the decrease in the applicable margin rate from borrowings from the Amended Credit Facility.

## Income Tax Expense

During the nine months ended September 30, 2018, income tax expense was \$29.2 million, or 29.6% of pre-tax income. In the nine months ended September 30, 2017, we recorded tax expense of \$23.2 million, or 25.9% of pre-tax income. The tax expense nine months ended September 30, 2018, as a percentage of pre-tax income, is higher than the U.S. federal statutory income tax rate of 21% primarily as a result of foreign statutory rate differences and discrete items recorded in the third quarter. The discrete items recorded in the third quarter primarily include a reduction to the tax expense related to the provision to return adjustments and an increase from the impact of resolving a foreign tax audit. The tax expense for the nine months ended September 30, 2017, as a percentage of pre-tax income, is lower than the U.S. federal statutory income tax rate of 35% primarily as a result of foreign statutory rate differences.

We have recognized the provisional tax impacts related to the 2017 Tax Cut and Jobs Act (the “Tax Act”) under the guidance of the SEC Staff Accounting Bulletin No. 118, Income Tax Accounting Implications of the Tax Cuts and Jobs Act (“SAB 118”). The ultimate impact may differ from these provisional amounts due to additional analysis, changes in interpretations and assumptions, additional regulatory guidance that may be issued, and actions we may take as a result of the Tax Act. The Company’s preliminary determinations related to the estimable impacts of the Tax Act that are effective for the year ended December 31, 2017 have not changed in the current quarter.

The Company continues to review the anticipated impacts of the global intangible low taxed income (“GILTI”) and the foreign-derived intangible income (“FDII”) on the Company for 2018. For the current quarter the company has made reasonable estimates of GILTI and FDII, as well as the impact of changes to valuation allowances related to certain positions. The combined provisional net impact of these items are not anticipated to be material to the tax rate in 2018. The Company has not recorded any potential deferred tax effects related to GILTI in the financial statements and has not made a policy decision regarding whether to record deferred taxes on GILTI or use the period cost method.

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## Results of Operations - Segment Information

Comparison of the nine months ended September 30, 2018 and 2017

## Performance Coatings

	Nine Months Ended			%	Change due to					
	September 30,				Price	Mix	Currency	Acquisition	Other	
	2018	2017	\$ Change	% Change						
	(Dollars in thousands)									
Segment net sales	\$ 554,036	\$ 424,549	\$ 129,487	30.5 %	\$ 21,372	\$ 5,124	\$ 5,652	\$ 97,340	\$ —	
Segment gross profit	130,319	109,205	21,114	19.3 %	21,372	577	3,419	23,976	(28,230)	
Gross profit as a % of segment net sales	23.5 %	25.7 %								

Net sales increased in Performance Coatings compared with the prior-year same period, primarily driven by sales from Endeka of \$82.9 million, SPC of \$10.1 million and Gardenia of \$3.3 million, and increases in sales of frits and glazes, porcelain enamel and digital inks of \$15.9 million, \$8.3 million and \$7.7 million, respectively. The increase in net sales was driven by sales from acquisitions of \$97.3 million, higher product pricing of \$21.4 million, favorable foreign currency impacts of \$5.7 million, and favorable volume and mix of \$5.1 million. Gross profit increased \$21.1 million from the prior-year same period, primarily driven by gross profit from acquisitions of \$24.0 million, favorable product pricing impacts of \$21.4 million, favorable foreign currency impacts of \$3.4 million, lower manufacturing costs of \$1.1 million and higher sales volume and mix of \$0.6 million, partially offset by higher raw material costs of \$29.3 million.

Nine Months Ended



September 30,

	2018	2017	\$ Change	% Change
(Dollars in thousands)				
Segment net sales by Region				
EMEA	\$ 355,510	\$ 241,884	\$ 113,626	47.0 %
Latin America	78,832	80,268	(1,436)	(1.8) %
Asia Pacific	82,990	68,670	14,320	20.9 %
United States	36,704	33,727	2,977	8.8 %
Total	\$ 554,036	\$ 424,549	\$ 129,487	30.5 %

The net sales increase of \$129.5 million was primarily driven by increases in sales from EMEA and Asia Pacific. The increase in sales from EMEA was primarily attributable to sales from acquisitions which contributed \$94.0 million and higher sales of all product lines. The increase in sales from Asia Pacific was driven by sales from acquisitions which contributed \$3.4 million and higher sales of frits and glazes, digital inks and porcelain enamel of \$6.6 million, \$2.8 million and \$1.5 million, respectively. The increase in sales from the United States was fully attributable to higher sales of porcelain enamel. The decrease in sales from Latin America was driven by lower sales of porcelain enamel and frits and glazes, partially offset by higher sales of digital inks.

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## Performance Colors and Glass

	Nine Months Ended September 30,		\$ Change	% Change	Change due to Volume /				
	2018 (Dollars in thousands)	2017			Price	Mix	Currency	Acquisitions	Other
Segment net sales	\$ 369,809	\$ 320,733	\$ 49,076	15.3 %	\$ 3,308	\$ 17,945	\$ 9,237	\$ 18,587	\$ —
Segment gross profit	128,785	115,385	13,400	11.6 %	3,308	3,468	3,319	4,209	(904)
Gross profit as a % of segment net sales	34.8 %	36.0 %							

Net sales increased compared with the prior-year same period, primarily driven by \$12.2 million in sales from Dip-Tech, and \$3.9 million in sales from Endeka. The increase in net sales was driven by sales from acquisitions of \$18.6 million, favorable volume and mix of \$17.9 million, favorable foreign currency impacts of \$9.2 million and higher product pricing of \$3.3 million. Gross profit increased from the prior-year same period, primarily due to gross profit from acquisitions of \$4.2 million, favorable manufacturing costs of \$3.5 million, favorable foreign currency impacts of \$3.3 million, higher sales volume and mix of \$3.5 million and higher product pricing of \$3.3 million, partially offset by higher raw material costs of \$4.4 million.

	Nine Months Ended September 30,		\$ Change	% Change
	2018	2017		
	(Dollars in thousands)			
Segment net sales by Region				
EMEA	\$ 180,801	\$ 144,586	\$ 36,215	25.0 %
United States	118,682	112,772	5,910	5.2 %

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Asia Pacific	53,142	47,091	6,051	12.8 %
Latin America	17,184	16,284	900	5.5 %
Total	\$ 369,809	\$ 320,733	\$ 49,076	15.3 %

The net sales increase of \$49.1 million was driven by higher sales from EMEA, Asia Pacific, the United States and Latin America. The increase in sales from EMEA was primarily attributable to \$10.6 million in sales from acquisitions and higher sales from all product groups. The increase from Asia Pacific was primarily due to an increase in sales of automobile products of \$4.6 million and sales from Dip-Tech of \$1.4 million. The increase in sales from the United States was primarily attributable an increase in sales from acquisitions of \$5.6 million and to higher sales in electronics, partially offset by lower sales of automobile products and industrial products. The increase in sales from Latin America was primarily attributable to sales in automobile products and industrial products, partially offset by lower sales of decoration products.

Color Solutions

	Nine Months Ended				Change due to				
	September 30,						Volume /		
	2018	2017	\$ Change	% Change			Price	Mix	Currency
	(Dollars in thousands)								
Segment net sales	\$ 293,089	\$ 273,917	\$ 19,172	7.0 %	\$ 8,327	\$ 3,108	\$ 6,776	\$ 961	\$ —
Segment gross profit	93,864	87,642	6,222	7.1 %	8,327	7,567	1,878	186	(11,737)
Gross profit as a % of segment net sales	32.0 %	32.0 %							

Net sales increased compared with the prior-year same period, primarily due to higher sales of pigments and surface technology products of \$10.4 million and \$8.2 million, respectively. The increase in net sales was driven by higher product pricing of \$8.3 million, favorable foreign currency impacts of \$6.8 million, higher volume and mix of \$3.1 million and sales from acquisitions of \$1.0

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million. Gross profit increased from the prior-year same period, primarily due to higher product pricing of \$8.3 million, favorable sales volume and mix of \$7.6 million, favorable foreign currency impacts of \$1.9 million and gross profit from acquisitions of \$0.2 million, partially offset by higher raw material costs of \$9.4 million and higher manufacturing costs of \$2.3 million.

	Nine Months Ended September 30,			
	2018	2017	\$ Change	% Change
Segment net sales by Region	(Dollars in thousands)			
United States	\$ 126,598	\$ 118,886	\$ 7,712	6.5 %
EMEA	109,985	103,538	6,447	6.2 %
Asia Pacific	30,606	26,971	3,635	13.5 %
Latin America	25,900	24,522	1,378	5.6 %
Total	\$ 293,089	\$ 273,917	\$ 19,172	7.0 %

The net sales increase of \$19.2 million was driven by higher sales from all regions. The higher sales from EMEA, Asia Pacific and Latin America were driven by sales of pigment products. The increase in sales from the United States was primarily driven by sales of surface technology products.

## Summary of Cash Flows for the nine months ended September 2018 and 2017

	Nine Months Ended September 30,		
	2018	2017	\$ Change
	(Dollars in thousands)		
Net cash provided by operating activities	\$ 35,686	\$ 34,691	\$ 995
Net cash used in investing activities	(111,919)	(99,245)	(12,674)
Net cash provided by financing activities	141,221	68,036	73,185
Effect of exchange rate changes on cash and cash equivalents	(2,261)	3,147	(5,408)
Increase in cash and cash equivalents	\$ 62,727	\$ 6,629	\$ 56,098

The following table includes details of net cash provided by operating activities.

	Nine Months Ended		
	2018	2017	\$ Change
	(Dollars in thousands)		
Cash flows from operating activities:			
Net income	\$ 69,602	\$ 66,315	\$ 3,287
Loss (gain) on sale of assets and business	485	(1,214)	1,699
Depreciation and amortization	40,238	36,040	4,198
Interest amortization	2,684	2,375	309
Restructuring and impairment	4,277	3,629	648
Loss on extinguishment of debt	3,226	3,905	(679)
Accounts receivable	(36,439)	(44,952)	8,513
Inventories	(58,833)	(31,379)	(27,454)
Accounts payable	11,103	581	10,522
Other current assets and liabilities, net	(17,331)	(11,655)	(5,676)
Other adjustments, net	16,674	11,046	5,628
Net cash provided by operating activities	\$ 35,686	\$ 34,691	\$ 995

Cash flows from operating activities. Cash flows provided by operating activities increased \$1.0 million in the first nine months of 2018 compared with the prior-year same period. The increase was primarily due to an increase in net income of \$3.3 million and other non-cash items, partially offset by higher cash outflows for net working capital of \$8.4 million.

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Cash flows used in investing activities. Cash flows used in investing activities increased \$12.7 million in the first nine months of 2018 compared with the prior-year same period. The increase was primarily due to higher cash outflows for capital expenditures of \$34.0 million, partially offset by lower cash outflows for business acquisitions, net of cash acquired of \$24.1 million.

Cash flows from financing activities. Cash flows provided by financing activities increased \$73.2 million in the first nine months of 2018 compared with the prior-year same period. As further discussed in Note 8, during the nine months ended September 30, 2018, we paid off our Credit Facility and entered into our Amended Credit Facility, consisting of a \$500 million secured revolving line of credit and \$820 million secured term loan facilities. Further, compared to the prior-year same period, purchase of treasury stock increased in the nine months ended by \$17.0 million.

Capital Resources and Liquidity

Amended Credit Facility

On April 25, 2018 the Company entered into an amendment (the “Amended Credit Facility”) to its existing credit facility (the “Credit Facility”) which Amended Credit Facility (a) provided a new revolving facility (the “2018 Revolving Facility”), which replaced the Company’s existing revolving facility, (b) repriced the (“Tranche B-1 Loans”), (c) provided new tranches of term loans (“Tranche B-2 Loans” and “Tranche B-3 Loans”) denominated in U.S. dollars and borrowed by the Company’s existing credit facility and will be used for ongoing working capital requirements and general corporate purposes. The (“Tranche B-2 Loans”) are borrowed by the Company and the (“Tranche B-3 Loans”) are borrowed on a joint and several basis by Ferro GmbH and Ferro Europe Holdings LLC.

The Amended Credit Facility consists of a \$500 million secured revolving line of credit with a maturity of February 2023, a \$355 million secured term loan facility with a maturity of February 2024, a \$235 million secured term loan facility with a maturity of February 2024 and a \$230 million secured term loan facility with a maturity of February 2024. The term loans are payable in equal quarterly installments in an amount equal to 0.25% of the original principal amount of the term loans, with the remaining balance due on the maturity date thereof. In addition, the Company is required, on an annual basis, to make a prepayment in an amount equal to a portion of the Company’s excess cash flow, as calculated pursuant to the Amended Credit Facility, which prepayment will be applied first to the term loans until they are paid in full, and then to the revolving loans.

Subject to the satisfaction of certain conditions, the Company can request additional commitments under the revolving line of credit or term loans in the aggregate principal amount of up to \$250 million to the extent that existing or new lenders agree to provide such additional commitments and/or term loans. The Company can also raise certain additional debt or credit facilities subject to satisfaction of certain covenant levels.

Certain of the Company’s U.S. subsidiaries have guaranteed the Company’s obligations under the Amended Credit Facility and such obligations are secured by (a) substantially all of the personal property of the Company and the U.S. subsidiary guarantors and (b) a pledge of 100% of the stock of certain of the Company’s U.S. subsidiaries and 65% of

the stock of certain of the Company's direct foreign subsidiaries. The Tranche B-3 Loans are guaranteed by the Company, the U.S. subsidiary guarantors and a cross-guaranty by the borrowers of the Tranche B-3 Loans, and are secured by the collateral securing the revolving loans and the other term loans, in addition to a pledge of the equity interests of Ferro GmbH.

**Interest Rate – Term Loans:** The interest rates applicable to the term loans will be, at the Company's option, equal to either a base rate or a LIBOR rate plus, in both cases, an applicable margin.

- The base rate for term loans will be the highest of (i) the federal funds rate plus 0.50%, (ii) syndication agent's prime rate, (iii) the daily LIBOR rate plus 1.00% or (iv) 0.00%. The applicable margin for base rate loans is 1.25%.
- The LIBOR rate for term loans shall not be less than 0.0% and the applicable margin for LIBOR rate term loans is 2.25%.
- For LIBOR rate term loans, the Company may choose to set the duration on individual borrowings for periods of one, two, three or six months, with the interest rate based on the applicable LIBOR rate for the corresponding duration.

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At September 30, 2018, the Company had borrowed \$353.2 million under the Tranche B-1 Loans at an interest rate of 4.64%, \$233.8 million under the Tranche B-2 Loans at an interest rate of 4.64%, and \$228.9 million under the Tranche B-3 Loans at an interest rate of 4.64%. At September 30, 2018, there were no additional borrowings available under the Tranche B-1 Loans, Tranche B-2 Loans and Tranche B-3 Loans.

**Interest Rate – Revolving Credit Line:** The interest rates applicable to loans under the revolving credit line will be, at the Company's option, equal to either a base rate or a LIBOR rate plus, in both cases, an applicable variable margin. The variable margin will be based on the ratio of (a) the Company's total consolidated net debt outstanding (as defined in the Amended Credit Agreement) at such time to (b) the Company's consolidated EBITDA (as defined in the Amended Credit Agreement) computed for the period of four consecutive fiscal quarters most recently ended.

- The base rate for revolving loans will be the highest of (i) the federal funds rate plus 0.50%, (ii) syndication agent's prime rate, (iii) the daily LIBOR rate plus 1.00% or (iv) 0.00%. The applicable margin for base rate loans will vary between 0.50% to 1.50%.
- The LIBOR rate for revolving loans shall not be less than 0% and the applicable margin for LIBOR rate revolving loans will vary between 1.50% and 2.50%.
- For LIBOR rate revolving loans, the Company may choose to set the duration on individual borrowings for periods of one, two, three or six months, with the interest rate based on the applicable LIBOR rate for the corresponding duration.

At September 30, 2018, there were \$111.9 million borrowings under the revolving credit line at an interest rate of 2.59%. After reductions for outstanding letters of credit secured by these facilities, we had \$383.4 million of additional borrowings available under the revolving credit facilities at September 30, 2018.

The Amended Credit Facility contains customary restrictive covenants including, but not limited to, limitations on use of loan proceeds, limitations on the Company's ability to pay dividends and repurchase stock, limitations on acquisitions and dispositions, and limitations on certain types of investments. The Amended Credit Facility also contains standard provisions relating to conditions of borrowing and customary events of default, including the non-payment of obligations by the Company and the bankruptcy of the Company.

Specific to the 2018 Revolving Facility, the Company is subject to a financial covenant regarding the Company's maximum leverage ratio. If an event of default occurs, all amounts outstanding under the Amended Credit Facility agreement may be accelerated and become immediately due and payable. At September 30, 2018, we were in compliance with the covenants of the Amended Credit Facility.

## Off Balance Sheet Arrangements

**Consignment and Customer Arrangements for Precious Metals.** We use precious metals, primarily silver, in the production of some of our products. We obtain precious metals from financial institutions under consignment agreements. The financial institutions retain ownership of the precious metals and charge us fees based on the amounts we consign and the period of consignment. These fees were \$0.5 million and \$0.3 million for the three months ended September 30, 2018 and 2017 respectively. We had on hand precious metals owned by participants in our precious metals program of \$47.1 million at September 30, 2018, and \$37.7 million at December 31, 2017, measured at fair value based on market prices for identical assets.

The consignment agreements under our precious metals program involve short-term commitments that typically mature within 30 to 90 days of each transaction and are typically renewed on an ongoing basis. As a result, the Company relies on the continued willingness of financial institutions to participate in these arrangements to maintain



this source of liquidity. On occasion, we have been required to deliver cash collateral. While no deposits were outstanding at September 30, 2018, or December 31, 2017, we may be required to furnish cash collateral in the future based on the quantity and market value of the precious metals under consignment and the amount of collateral-free lines provided by the financial institutions. The amount of cash collateral required is subject to review by the financial institutions and can be changed at any time at their discretion, based in part on their assessment of our creditworthiness.

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### Bank Guarantees and Standby Letters of Credit.

At September 30, 2018, the Company and its subsidiaries had bank guarantees and standby letters of credit issued by financial institutions that totaled \$8.0 million. These agreements primarily relate to Ferro's insurance programs, foreign energy purchase contracts and foreign tax payments.

### Other Financing Arrangements

We maintain other lines of credit to provide global flexibility for Ferro's short-term liquidity requirements. These facilities are uncommitted lines for our international operations and totaled \$40.3 million and \$64.5 million at September 30, 2018, and December 31, 2017, respectively. We had \$31.4 million and \$39.4 million of additional borrowings available under these lines at September 30, 2018, and December 31, 2017, respectively.

### Liquidity Requirements

Our primary sources of liquidity are available cash and cash equivalents, available lines of credit under the revolving credit facility, and cash flows from operating activities. As of September 30, 2018, we had \$126.3 million of cash and cash equivalents. Cash generated in the U.S. is generally used to pay down amounts outstanding under our revolving credit facility and for general corporate purposes, including acquisitions. If needed, we could repatriate the majority of cash held by foreign subsidiaries without the need to accrue and pay U.S. income taxes. We do not anticipate a liquidity need requiring such repatriation of these funds to the U.S.

Our liquidity requirements and uses primarily include debt service, purchase commitments, labor costs, working capital requirements, restructuring expenditures, acquisition costs, capital investments, precious metals cash collateral requirements, and postretirement obligations. We expect to meet these requirements in the long term through cash provided by operating activities and availability under existing credit facilities or other financing arrangements. Cash flows provided by operating activities are primarily driven by earnings before non-cash charges and changes in working capital needs. We had additional borrowing capacity of \$414.7 million at September 30, 2018, and \$356.7 million at December 31, 2017, available under our various credit facilities, primarily the 2018 Revolving Facility.

The 2018 Revolving Facility subjects us to a customary financial covenant regarding the Company's maximum leverage ratio. This covenant under our Amended Credit Facility restricts the amount of our borrowings, reducing our flexibility to fund ongoing operations and strategic initiatives.

As of September 30, 2018, we were in compliance with our maximum leverage ratio covenant of 4.25x as our actual ratio was 2.93x, providing \$89.7 million of EBITDA cushion on the leverage ratio, as defined within the Amended Credit Facility. To the extent that economic conditions in key markets deteriorate or we are unable to meet our business projections and EBITDA falls below approximately \$197 million for rolling four quarters, based on reasonably consistent net debt levels with those as of September 30, 2018, we could become unable to maintain compliance with our leverage ratio covenant. In such case, our lenders could demand immediate payment of outstanding amounts and we would need to seek alternate financing sources to pay off such debts and to fund our ongoing operations. Such financing may not be available on favorable terms, if at all.

Difficulties experienced in global capital markets could affect the ability or willingness of counterparties to perform under our various lines of credit, forward contracts, and precious metals program. These counterparties are major, reputable, multinational institutions, all having investment-grade credit ratings. Accordingly, we do not anticipate counterparty default. However, an interruption in access to external financing could adversely affect our business prospects and financial condition.

We assess on an ongoing basis our portfolio of businesses, as well as our financial and capital structure, to ensure that we have sufficient capital and liquidity to meet our strategic objectives. As part of this process, from time to time we evaluate the possible divestiture of businesses that are not critical to our core strategic objectives and, where appropriate, pursue the sale of such businesses and assets. We also evaluate and pursue acquisition opportunities that we believe will enhance our strategic position. Generally, we publicly announce divestiture and acquisition transactions only when we have entered into a material definitive agreement or closed on those transactions.

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Critical Accounting Policies and Their Application

There were no material changes to our critical accounting policies described in “Critical Accounting Policies” within Item 7 of our Annual Report on Form 10-K for the year ended December 31, 2017.

Impact of Newly Issued Accounting Pronouncements

Refer to Note 2 to the condensed consolidated financial statements under Item 1 of this Quarterly Report on Form 10-Q for a discussion of accounting standards we recently adopted or will be required to adopt.

Risk Factors

Certain statements contained here and in future filings with the SEC reflect the Company’s expectations with respect to future performance and constitute “forward-looking statements” within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. These statements are subject to a variety of uncertainties, unknown risks and other factors concerning the Company’s operations and business environment, which are difficult to predict and are beyond the control of the Company. Factors that could adversely affect our future financial performance include those described under the heading “Risk Factors” in Item 1A of Part I of our Annual Report on Form 10-K for the year ended December 31, 2017.

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## Item 3. Quantitative and Qualitative Disclosures About Market Risk

The primary objective of the following information is to provide forward-looking quantitative and qualitative information about our exposure to instruments that are sensitive to fluctuations in interest rates and foreign currency exchange rates.

Our exposure to interest rate risk arises from our debt portfolio. We manage this risk by controlling the mix of fixed versus variable-rate debt after considering the interest rate environment and expected future cash flows. To reduce our exposure to interest rate changes on variable rate debt, we entered into interest rate swap agreements. These swaps effectively convert a portion of our variable rate debt to a fixed rate. Our objective is to limit variability in earnings, cash flows and overall borrowing costs caused by changes in interest rates, while preserving operating flexibility.

We operate internationally and enter into transactions denominated in foreign currencies. These transactions expose us to gains and losses arising from exchange rate movements between the dates foreign currencies are recorded and the dates they are settled. We manage this risk by entering into forward currency contracts that substantially offset these gains and losses.

The notional amounts, carrying amounts of assets (liabilities), and fair values associated with our exposure to these market risks and sensitivity analysis about potential gains (losses) resulting from hypothetical changes in market rates are presented in the table below.

	September 30, 2018	December 31, 2017
	(Dollars in thousands)	
Variable-rate debt:		
Carrying amount	\$ 922,770	\$ 739,602
Fair value	931,432	742,634
Increase in annual interest expense from 1% increase in interest rates	3,821	4,890
Decrease in annual interest expense from 1% decrease in interest rates	(3,821)	(2,992)
Fixed-rate debt:		
Carrying amount	6,325	7,112
Fair value	3,835	3,973
Change in fair value from 1% increase in interest rates	NM	NM
Change in fair value from 1% decrease in interest rates	NM	NM
Interest rate swaps:		
Notional amount	318,402	258,045
Carrying amount and fair value	1,025	1,492
Change in fair value from 1% increase in interest rates	14,909	9,157
Change in fair value from 1% decrease in interest rates	(14,096)	(3,678)
Cross currency swaps:		

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Notional amount	345,763	—
Carrying amount and fair value	13,077	—
Change in fair value from 10% increase	(35,811)	—
Change in fair value from 10% decrease	40,945	—
Foreign currency forward contracts:		
Notional amount	371,117	238,457
Carrying amount and fair value	3,004	(469)
Change in fair value from 10% appreciation of U.S. dollar	10,410	3,541
Change in fair value from 10% depreciation of U.S. dollar	(12,735)	(4,328)







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Item 4. Controls and Procedures

Evaluation of Disclosure Controls and Procedures

Ferro is committed to maintaining disclosure controls and procedures that are designed to ensure that information required to be disclosed in its Exchange Act reports is recorded, processed, summarized, and reported within the time periods specified in the U.S. Securities and Exchange Commission's rules and forms, and that such information is accumulated and communicated to its management, including its Chief Executive Officer and Chief Financial Officer, as appropriate to allow timely decisions regarding required disclosure.

As required by Rule 13a-15(b) of the Exchange Act, Ferro has carried out an evaluation, under the supervision and with the participation of its management, including its Chief Executive Officer and its Chief Financial Officer, of the effectiveness of the design and operation of its disclosure controls and procedures. The evaluation examined those disclosure controls and procedures as of September 30, 2018, the end of the period covered by this report. Based on that evaluation, our Chief Executive Officer and our Chief Financial Officer concluded that the disclosure controls and procedures were effective as of September 30, 2018.

Changes in Internal Control over Financial Reporting

During the third quarter of 2018, there were no changes in our internal control over financial reporting that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

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PART II — OTHER INFORMATION

Item 1. Legal Proceedings

In November 2017, Suffolk County Water Authority filed a complaint, Suffolk County Water Authority v. The Dow Chemical Company et al., against the Company and a number of other companies in the U.S. Federal Court for the Eastern District of New York with regard to the product 1,4 dioxane. The plaintiff alleges, among other things, that the Suffolk County water supply is contaminated with 1,4 dioxane and that the defendants are liable for unspecified costs of cleanup and remediation of the water supply, among other damages. The Company has not manufactured 1,4 dioxane since 2008, denies the allegations related to liability for the plaintiff's claims, and is vigorously defending this proceeding. In March 2018, the defendants, including the Company, filed a motion to dismiss the complaint, which was heard by the court in June 2018. The Company currently does not expect the outcome of this proceeding to have a material adverse impact on its consolidated financial condition, results of operations, or cash flows, net of any insurance coverage. However, it is not possible to predict the ultimate outcome of this proceeding due to the unpredictable nature of litigation.

In addition to the proceeding described above, the Company and its consolidated subsidiaries are subject from time to time to various claims, lawsuits, investigations, and proceedings related to products, services, contracts, environmental, health and safety, employment, intellectual property, and other matters, including with respect to divested businesses. The outcome of such matters is unpredictable, our assessment of them may change, and resolution of them could have a material adverse effect on the Company's consolidated financial position, results of operations, or cash flows. We do not currently expect the resolution of such matters to materially affect the consolidated financial position, results of operations, or cash flows of the Company.

Item 1A. Risk Factors

There were no material changes to the risk factors disclosed in the Company's Annual Report on Form 10-K for the year ended December 31, 2017.

Item 2. Unregistered Sales of Equity Securities and Use of Proceeds

Our ability to pay common stock dividends is limited by certain covenants in our Amended Credit Facility other than dividends payable solely in Capital Securities, as defined in the agreement.

The following table summarizes purchases of our common stock by the Company and affiliated purchasers during the three months ended September 30, 2018:

Total Number of Shares Purchased	Maximum Dollar Amount that May
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	Total Number of Shares Purchased	Average Price Paid per Share	as Part of Publicly Announced Plans or Programs	Yet Be Purchased Under the Plans or Programs
July 1, 2018 to July 31, 2018	406,115	\$ 21.05	8,548,782	\$ 35,437,419
August 1, 2018 to August 31, 2018	114,250	\$ 21.29	2,432,728	\$ 33,004,691
September 1, 2018 to September 30, 2018	194	\$ 21.48	4,167	\$ 33,000,524
Total	520,559		10,985,677	

(Dollars in thousands, except for per share amounts)

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Item 3. Defaults Upon Senior Securities

Not applicable.

Item 4. Mine Safety Disclosures

Not applicable.

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Item 5. Other Information

Not applicable.

Item 6. Exhibits

The exhibits listed in the attached Exhibit Index are the exhibits required by Item 601 of Regulation S-K.

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SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned thereunto duly authorized.

FERRO CORPORATION

(Registrant)

Date: November 8, 2018

/s/ Peter T. Thomas  
Peter T. Thomas  
Chairman, President and Chief Executive Officer

(Principal Executive Officer)

Date: November 8, 2018

/s/ Benjamin J. Schlater  
Benjamin J. Schlater  
Vice President and Chief Financial Officer

(Principal Financial Officer)

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EXHIBIT INDEX

The following exhibits are filed with this report or are incorporated here by reference to a prior filing in accordance with Rule 12b-32 under the Securities and Exchange Act of 1934.

Exhibit:

3 Articles of incorporation and by-laws:

- 3.1 Eleventh Amended Articles of Incorporation of Ferro Corporation (incorporated by reference to Exhibit 4.1 to Ferro Corporation's Registration Statement on Form S-3, filed March 5, 2008).
- 3.2 Certificate of Amendment to the Eleventh Amended Articles of Incorporation of Ferro Corporation filed December 29, 1994 (incorporated by reference to Exhibit 4.2 to Ferro Corporation's Registration Statement on Form S-3, filed March 5, 2008).
- 3.3 Certificate of Amendment to the Eleventh Amended Articles of Incorporation of Ferro Corporation filed on June 23, 1998 (incorporated by reference to Exhibit 4.3 to Ferro Corporation's Registration Statement on Form S-3, filed March 5, 2008).
- 3.4 Certificate of Amendment to the Eleventh Amended Articles of Incorporation of Ferro Corporation filed on October 17, 2011 (incorporated by reference to Exhibit 3.1 to Ferro Corporation's Current Report on Form 8-K, filed October 17, 2011).
- 3.5 Certificate of Amendment to the Eleventh Amended Articles of Incorporation of Ferro Corporation filed on April 25, 2014 (incorporated by reference to Exhibit 3.5 to Ferro's Quarterly Report on Form 10-Q, for the quarter ended June 30, 2014).
- 3.6 Ferro Corporation Amended and Restated Code of Regulations (incorporated by reference to Exhibit 3.1 to Ferro Corporation's current Report on Form 8-K filed December 12, 2016.)  
The Company agrees, upon request, to furnish to the U.S. Securities and Exchange Commission a copy of any instrument authorizing long-term debt that does not authorize debt in excess of 10% of the total assets of the Company and its subsidiaries on a consolidated basis.
- 10.1 First Amendment, dated as of April 25, 2018, to Credit Agreement among Ferro Corporation, Ferro GmbH and Ferro Europe Holding LLC, certain other subsidiaries of Ferro Corporation, PNC Bank, National Association, as the Administrative Agent, Collateral Agent and an Issuer, Deutsche Bank AG New York Branch, as the Syndication Agent and an Issuer, and various financial institutions as lenders (incorporated by reference to Exhibit 10.1 to Ferro Corporation's current Report on Form 8-K, filed April 27, 2018).
- 10.2 Ferro Corporation 2018 Omnibus Incentive Plan (incorporated by reference to Exhibit 10.1 to Ferro Corporation's Current Report on Form 8-K, filed May 7, 2018).

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Exhibit:

31	Certifications:
31.1	<u>Certification of Principal Executive Officer Pursuant to Rule 13a-14(a)/15d-14(a).</u>
31.2	<u>Certification of Principal Financial Officer Pursuant to Rule 13a-14(a)/15d-14(a).</u>
32.1	<u>Certification of Principal Executive Officer Pursuant to 18 U.S.C. 1350.</u>
32.2	<u>Certification of Principal Financial Officer Pursuant to 18 U.S.C. 1350.</u>
101	XBRL Documents:
101.INS	XBRL Instance Document
101.SCH	XBRL Schema Document
101.CAL	XBRL Calculation Linkbase Document
101.LAB	XBRL Labels Linkbase Document
101.PRE	XBRL Presentation Linkbase Document
101.DEF	XBRL Definition Linkbase Document

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\*Indicates management contract or compensatory plan, contract or arrangement in which one or more Directors and/or executives of Ferro Corporation may be participants.

\*\* Certain exhibits and schedules have been omitted and the registrant agrees to furnish a copy of any omitted exhibits and schedules to the Securities and Exchange Commission