CHOOSE NORDSON

NORDSON CORPORATION 2016 ANNUAL REPORT

CHOOSE NORDSON

We are the world leader in precision dispensing, fluid control and related technologies. Our proven model includes best-in-class products, application
expertise, direct global support and operational excellence. We strive to deliver excellent financial performance
for our shareholders, real and sustained value for our customers, professional development opportunities and rewards for our employees, and support for the communities where we operate.

To all our stakeholders,
we thank you for choosing Nordson.

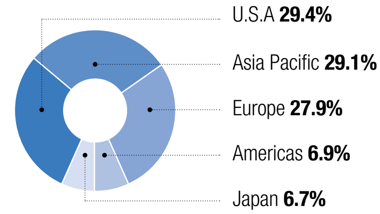
FY16 FINANCIAL RESULTS

SALES

$1.8 B

7% OVER FY15

Inclusive of 7% organic growth



By geography

OPERATING MARGIN

21.5 %

2.7 pts OVER FY15

FREE CASH FLOW BEFORE DIVIDENDS

$ 272 M

36 % OVER FY15

= 101% of net income

DILUTED EPS

$ 4.73

37 % OVER FY15

DIVIDENDS PER SHARE

$ 0.99

10 % OVER FY15

21% payout ratio
53 years of consecutive increases

RETURN ON AVERAGE TOTAL CAPITAL

16 %

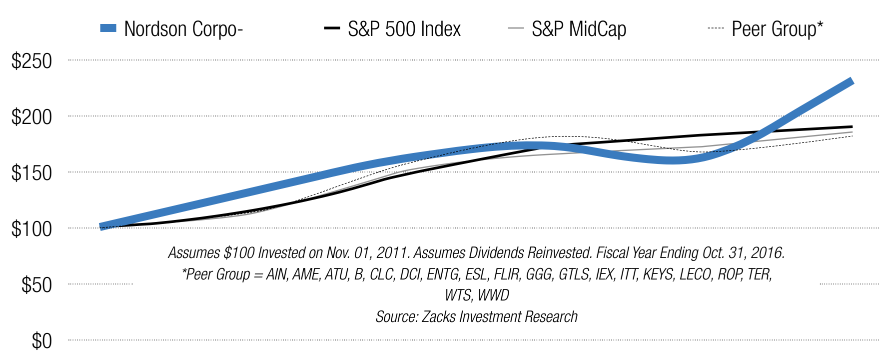
3 pts OVER FY15

RETURN ON AVERAGE SHAREHOLDER EQUITY

37 %

11 pts OVER FY15

CUMULATIVE TOTAL RETURN



Assumes $100 Invested on Nov. 01, 2011. Assumes Dividends Reinvested. Fiscal Year Ending Oct. 31, 2016.
**Peer Group = AIN, AME, ATU, B, CLC, DCI, ENTG, ESL, FLIR, GGG, GTLS, IEX, ITT, KEYS, LECO, ROP, TER, WTS, WWD*
Source: Zacks Investment Research

INNOVATION

R&D SPENDING

$46M

TOTAL PATENTS

541	1,207	212	878
U.S. Current	**Foreign Current**	**U.S. Pending**	**Foreign Pending**

CONTINUOUS IMPROVEMENT

SALES PER EMPLOYEE*

$294K

6% OVER FY15

OPERATING PROFIT PER EMPLOYEE*

$63K

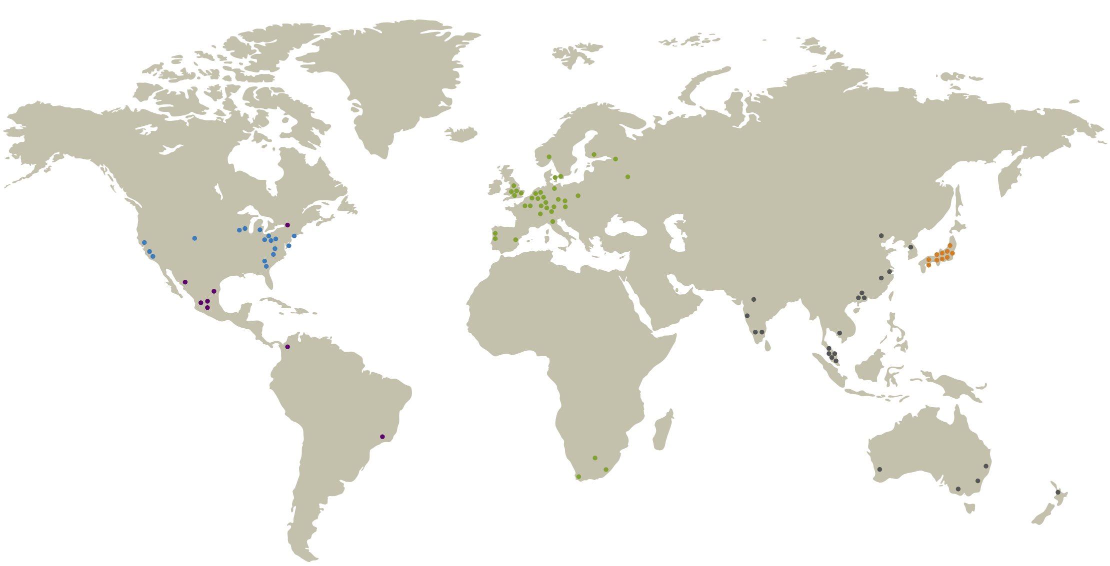
20% OVER FY15

** Average number of employees during year*

WORLD CLASS TEAM

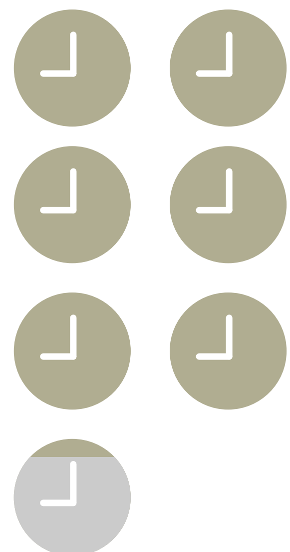
6,127 EMPLOYEES WORLDWIDE

FACILITIES IN NEARLY **40** COUNTRIES



GIVING BACK

6,000+ HOURS VOLUNTEERED



CHARITABLE GIVING

$8.2M

Nordson Corporation & Nordson Corporation Foundation

LETTER TO SHAREHOLDERS

Michael F. Hilton, President & CEO

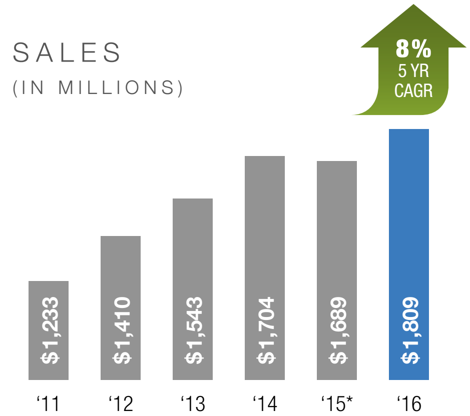
Nordson's team of more than 6,000 dedicated employees delivered record sales, operating profit and diluted earnings per share in fiscal 2016. Customers around the world continued to choose Nordson for our best-in-class technology, application expertise, and direct global sales and service.

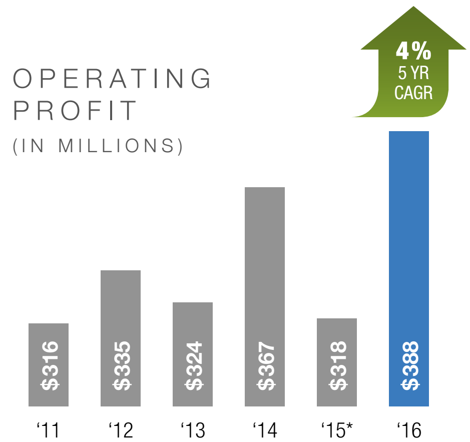
Assuming continued macroeconomic softness in 2016, Nordson entered the year focused on driving our own growth, and improving operating margin independent of sales volume leverage. Our team delivered on both of these goals.

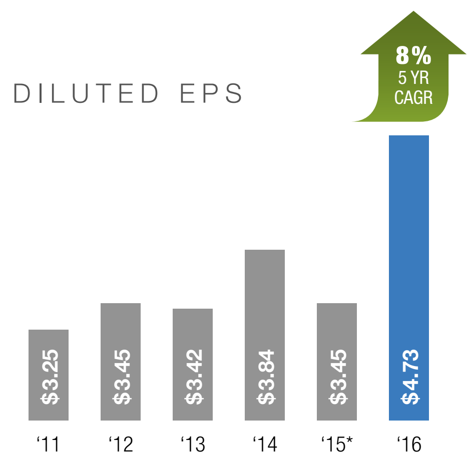
We delivered organic growth of 7 percent compared to the prior year, a rate well ahead of global GDP and many of our peers. Our growth model does not depend on any single approach. Rather, we follow many paths to increase our opportunities for growth: introduction of new "must-have" products, product tiering to support varying levels of customer need, new applications for existing and new products, support for customer product changes, penetration of emerging markets and recapitalization of our large installed base.

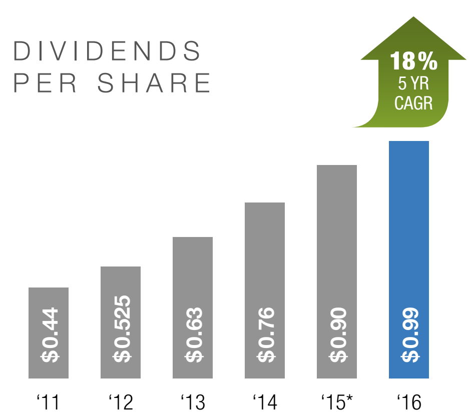
We continued to improve performance by leveraging the strong top line growth and employing tools within the Nordson Business System. Operating margin expanded 2.7 percentage points to 21.5 percent. Throughout the organization, we are focused on continuous improvement in the areas of commercial effectiveness, segmentation, innovation, manufacturing, safety, talent, quality and supply chain. Key Performance Indicators (KPIs) attached to each of these areas are rigorously monitored to help us track success.

All three of our segments helped deliver this year's record results.









** FY15 results significantly impacted by negative currency translation effects as compared to the prior year*

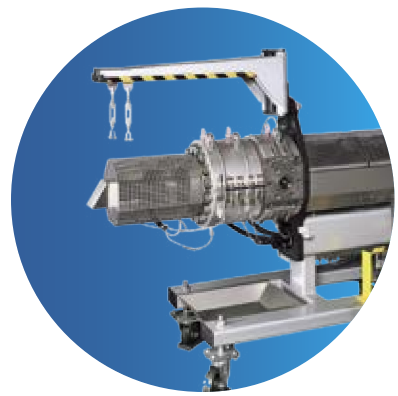
Adhesive Dispensing Systems (ADS)

SALES		OPERATING MARGIN	
$880M	5% OVER FY15	26.1%	2.7 pts OVER FY15

ADS delivered organic growth in all product lines and improved operating performance compared to the prior year. Consumer non-durable end markets continue to make up the largest portion of this segment and provide a steady and reliable base of opportunity. Makers of disposable hygienic products turned to us to support installation of new production lines and upgrades to existing lines. In rigid packaging markets, new products, effective tiering and premier support drove customers to invest in Nordson. General product assembly markets were also solid this year, where we were particularly successful in woodworking and furniture assembly applications. In our polymer product line, we generated solid growth in melt delivery and pelletizing applications.

We are very pleased with ADS' expanded operating margin this year, and we believe further margin enhancement is still in front of us. Specifically, we expect to gain efficiencies as we complete the integration of two factories in Münster, Germany, and execute on our plan to consolidate three U.S. facilities supporting polymer product lines into a single manufacturing center of excellence in Austintown, Ohio.

In recognition of the unique needs of emerging global markets, **EZ Melt** melters provide reliable adhesive delivery to low and mid-speed nonwovens disposable hygiene product manufacturing. A graphical user interface simplifies operation for a multi-language work force.



Our new **BKG® HiCon** R-Type 250 filtration system transforms highly contaminated polyolefin or styrenic plastics into clean, high-quality material. This green solution boosts recycling productivity and minimizes melt loss.

The **ProBlue Liberty™ ATS** combines the benefits of a tankless adhesive dispensing system with an integrated flow meter (patent pending), continuously tracking per-package adhesive use. Customers can monitor adhesive consumption in real time and download historical data for analysis, giving them the tools to virtually eliminate all waste.

Advanced Technology Systems (ATS)

SALES

$676M — 14% OVER FY15

OPERATING MARGIN

23.6% — 3.2 pts OVER FY15

ATS delivered outstanding organic growth and improved operating performance compared to the prior year. In electronics end markets, strong demand for automated and semi-automated dispensing systems drove our growth. Our test and inspection product line also grew, including new successes we are realizing as a result of last year's MatriX Technologies acquisition. Our leadership position with high end mobile device manufacturers continues, and, encouragingly, our product tiering efforts are resulting in success with a variety of emerging Chinese mobile device OEMs. Further growth is coming from new applications in wafer level dispensing, testing and inspecting. Servers, storage, automotive and factory automation applications are also providing us with great opportunities.

Our medical fluid management product lines are also thriving. Several new products are aiding penetration of niches such as biopharmaceuticals, patient monitoring, ophthalmic and orthopedic. The acquisition of LinkTech Quick Couplings during the year strengthens our position as a preferred supplier to medical device OEMs worldwide.

In addition to leveraging volume, we are driving improved operating performance in ATS through a variety of initiatives. Specifically, we are realizing benefits from the consolidation of an operation in Germany and optimization of our Colorado, Minnesota and Mexico medical product facilities. We expect additional benefits from these and other initiatives going forward.

The **IntelliJet®** **Jetting System** is a cutting-edge, piezo-driven jet with the **ReadiSet Jet Cartridge**, designed for small dots and high frequency for advanced dispensing applications.

Our new **Quadra™7** is an ultra-high resolution, off-line X-ray system offering premium levels of inspection, speed and ease of use for the demanding electronics market. It is a preferred solution for research, development, failure analysis or quality control labs.

Our expanded offering of **needle-free, swabable valves** provide medical customers higher flow rates, low priming volumes, and a straight-through design for unobstructed flow. The valves are ideal for the injection and aspiration of fluids, particularly for flushing and drainage systems, IV applications, urology and blood processing.

Our new **781Mini SprayValve** provides users a 60 percent smaller form factor than conventional spray valves, allowing it to dispense fluids in tighter spaces and onto smaller, more complex surfaces, with consistent area coverage as small as 1 mm wide.

Industrial Coating Systems (ICS)

SALES

$253M — 2% FROM FY15

OPERATING MARGIN

17.2% — 1.2 pts OVER FY15

ICS delivered improved operating performance in a year where sales were down slightly on very challenging comparisons to the prior year. Given the uncertain macroeconomic environment, some customers in the durable goods end markets this segment serves took a cautious approach to capital investments. We continued to pursue available opportunities with vigor, resulting in a solid project list that began to convert to orders and revenue more rapidly by year's end.

We did see good growth in equipment for dispensing ambient temperature materials, especially in automotive assembly applications. As manufacturers seek to reduce vehicle weight to increase fuel efficiency, they are using adhesives to replace traditional metal rivets and welds and provide structural integrity. Today's vehicles can contain up to 900 linear feet of adhesive, more than double the amount used just a few short years ago. A similar trend is emerging in aerospace assembly, where we have realized important initial successes. Liquid painting applications were also a bright spot for us this year.

Despite the softer top line in this segment, we delivered operating margin in line with our mid-teens goal for this business. We also are beginning to see the benefit of our multi-year machining upgrade project and are making solid progress on other continuous improvement initiatives.

The **Spectrum® HD Powder Feed Center** offers fast, highly automated color change in a simple, compact and easy-to-operate system. It can be combined with Nordson fast color change booths or easily integrated into an existing, cyclone-recovery booth.

The portable **Encore® HD Powder Spray System** employs high density, low velocity spray technology to deliver greater material transfer efficiency, less overspray and a superior quality cured finish quality for every conceivable part type.

Looking Ahead

We enter fiscal 2017 against a backdrop of continued modest global growth and softer emerging markets near term. We continue to operate from a position of strength, with clear objectives, a proven business model, a strong balance sheet, and a balanced approach to capital allocation. Our strategic priorities are straightforward: deliver on growth initiatives and technology development projects, extend focus on profitability, expand our M&A opportunity set, develop our talent and the organization of the future, and support the communities where we operate.

We know you have many investment choices. On behalf of our worldwide team, thank you for choosing Nordson.

Sincerely,

Michael F. Hilton, President & CEO

January 27, 2017

FINANCIAL SUMMARY

Dollar amounts in thousands except for per-share amounts	2016	2015	2014	2013
OPERATING DATA (a)				
Sales	$ 1,808,994	$ 1,688,666	$ 1,704,021	$ 1,542,921
Cost of sales	815,495	774,702	758,923	676,777
% of sales	45	46	45	44
Selling and administrative expenses	594,293	584,823	575,442	541,169
% of sales	33	35	34	35
Severance and restructuring costs	10,775	11,411	2,551	1,126
Goodwill and long-lived asset impairments	—	—	—	—
Operating profit (loss)	388,431	317,730	367,105	323,849
% of sales	21	19	22	21
Net income (loss)	271,843	211,111	246,773	221,817
% of sales	15	13	14	14
FINANCIAL DATA (a)				
Working capital	$ 414,032	$ 420,815	$ 301,815	$ 365,269
Net property, plant and equipment, and other non-current assets	1,676,790	1,648,853	1,607,447	1,451,113
Total capital (b)	1,769,151	1,726,341	1,662,283	1,498,082
Total assets	2,422,365	2,360,444	2,280,130	2,053,179
Long-term liabilities	1,239,219	1,409,652	1,004,465	928,519
Shareholders' equity	851,603	660,016	904,797	887,863
Return on average total capital - % (c)	16	13	17	18
Return on average shareholders' equity - % (e)	37	26	27	29
PER SHARE DATA (a)(g)				
Average number of common shares	57,060	60,652	63,656	64,214
Average number of common shares and common-share equivalents	57,530	61,151	64,281	64,908
Basic earnings (loss) per share	$ 4.76	$ 3.48	$ 3.88	$ 3.45
Diluted earnings (loss) per share	4.73	3.45	3.84	3.42
Dividends per common share	0.99	0.90	0.76	0.63
Book value per common share	14.85	11.51	14.49	13.83

(a) See accompanying Notes to Consolidated Financial Statements.

(b) Notes payable, plus current portion of long-term debt, plus long-term debt, minus cash and marketable securities, plus shareholders' equity.

(c) Income from continuing operations, plus after-tax interest expense on borrowings as a percentage of the average of quarterly borrowings (net of cash), plus shareholders' equity over five accounting periods.

(d) The percentage for 2009 excludes goodwill and long-lived asset impairment charges. Including these charges, the return on average invested capital for 2009 would have been negative 21%.

2012	2011	2010	2009	2008	2007	2006
$ 1,409,578	$ 1,233,159	$ 1,041,551	$ 819,165	$ 1,124,829	$ 993,649	$ 892,221
586,289[h]	484,727	419,937	350,239	494,394	439,804	379,800
42	39	40	43	44	44	43
485,285	429,489	384,752	337,294	434,476	401,294	362,179
34	35	37	41	39	40	41
2,524	1,589	2,029	16,396	5,621	409	2,627
—	1,811	—	243,043	—	—	—
335,480	315,543	234,833	(127,807)	190,338	152,142	147,615
24	26	23	(16)	17	15	17
224,829	222,364	168,048	(160,055)	117,504	90,692	97,667
16	18	16	(20)	10	9	11

$ 242,939	$ 294,796	$ 259,117	$ 190,249	$ 180,317	$ 180,010	$ 105,979
1,242,829	827,493	535,323	544,003	782,356	801,916	475,586
1,261,962	853,071	567,323	508,989	847,253	846,911	498,978
1,829,515	1,304,450	986,354	890,674	1,166,669	1,211,840	822,890
816,061	550,966	289,368	364,276	388,561	450,809	151,037
669,770	571,323	505,072	369,976	574,112	531,117	430,528
23	35	32	10[d]	15	14	21
38	39	40	13[f]	20	19	26

64,407	67,616	67,610	67,129	67,492	67,094	66,729
65,103	68,425	68,442	67,129	68,613	68,363	68,361
$ 3.49	$ 3.29	$ 2.49	$ (2.38)	$ 1.74	$ 1.35	$ 1.46
3.45	3.25	2.46	(2.38)	1.71	1.33	1.43
0.525	0.44	0.39	0.36875	0.365	0.35	0.335
10.42	8.71	7.44	5.49	8.52	7.88	6.44

(e) Income from continuing operations as a percentage of average quarterly shareholders equity over five accounting periods.

(f) The percentage for 2009 excludes goodwill and long-lived asset impairment charges. Including these charges, the return on average shareholder equity for 2009 would have been negative 28%.

(g) Amounts adjusted for 2-for-1 stock split effective April 12, 2011.

(h) Includes $2,040 associated with the transfer of production and start-up activities related to a plant consolidation initiative.

SHAREHOLDER INFORMATION

Dividend Information and Price Range for Common Shares

Following is a summary of dividends paid per common share and the range of closing market prices during each quarter of 2016 and 2015.

2016	Dividend Paid	Common Share Price High	Common Share Price Low	2015	Dividend Paid	Common Share Price High	Common Share Price Low
1st Quarter	$0.24	$74.24	$51.89	**1st Quarter**	$0.22	$80.42	$71.58
2nd Quarter	$0.24	$80.50	$56.63	**2nd Quarter**	$0.22	$81.05	$72.10
3rd Quarter	$0.24	$89.42	$74.49	**3rd Quarter**	$0.22	$84.45	$71.75
4th Quarter	$0.27	$102.57	$87.63	**4th Quarter**	$0.24	$75.95	$58.52

Research Firms

The following firms provide research data on Nordson Corporation:

Alembic Global Advisors
Baird Equity Research
Barrington Research
Gabelli & Company
Great Lakes Review
KeyBanc Capital Markets
Longbow Research
Oppenheimer & Co. Inc.
Seaport Global
Sidoti & Company
SunTrust Robinson Humphrey
Wells Fargo Securities
Wunderlich Securities

Stock Listing Information

Nordson stock is traded on The Nasdaq Global Select Market under the symbol NDSN.

Annual Shareholders' Meeting

Date: February 28, 2017
Time: 8:00 a.m. EST
Location:
Baker Hostetler
2000 Key Tower | 127 Public Square | Cleveland, OH 44114

Independent Registered Accounting Firm

Ernst & Young LLP
Cleveland, Ohio

Transfer Agent and Registrar

Shareholder correspondence:
Computershare
P.O. Box 30170
College Station, TX 77842-3170

Overnight correspondence:
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College Station, TX 77845

Shareholder website: www.computershare.com/investor
Shareholder online inquiries: www-us.computershare.com/investor/contact
+1.800.622.6757 (U.S., Canada, Puerto Rico)
+1.781.575.2879 (Non U.S.)

Dividend Reinvestment Program

Nordson's Dividend Reinvestment Program provides shareholders the opportunity to automatically reinvest dividends in the company's common stock. The program also allows cash contributions as low as $50 and up to $250,000 annually, to purchase additional Nordson common shares. For details about this program, please contact Computershare.

Electronic Dividend Payments

Shareholders can opt to have their quarterly dividends deposited directly into a checking or savings account free of charge. For information about this service, please contact Computershare.

Nordson Online

Visit www.nordson.com/investors for news, stock quotes, SEC filings, email alerts, quarterly results webcasts and related information.

Form 10-K/Financial Reports

Nordson Corporation's Annual Report to the Securities and Exchange Commission (Form 10-K), quarterly reports and proxy statement are available on our web site at www.nordson.com/investors. Shareholders may obtain copies of these reports free of charge by sending written requests to:

James R. Jaye
Senior Director, Communications and Investor Relations
Nordson Corporation
28601 Clemens Road, Westlake, Ohio 44145
+1.440.414.5639 | jim.jaye@nordson.com

UNITED STATES SECURITIES AND EXCHANGE COMMISSION

Washington, D.C. 20549

FORM 10-K

ANNUAL REPORT PURSUANT TO SECTIONS 13 OR 15(d) OF THE SECURITIES EXCHANGE ACT OF 1934

(Mark One)

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

For the fiscal year ended October 31, 2016

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 0-7977

NORDSON CORPORATION

(Exact name of Registrant as specified in its charter)

Ohio	**34-0590250**
(State of incorporation)	(I.R.S. Employer Identification No.)
28601 Clemens Road	
Westlake, Ohio	**44145**
(Address of principal executive offices)	(Zip Code)

(440) 892-1580

(Registrant's Telephone Number, including area code)

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

Common Shares, without par value

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

None

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

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

Indicate by check mark whether the Registrant (1) has filed all reports required to be filed by Section 13 or 15 (d) of the Securities Exchange Act of 1934 during the preceding 12 months, 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 and posted on its corporate Web site, if any, every Interactive Data File required to be submitted and posted 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 and post such files). Yes ☒ No ☐

Indicate by check mark if disclosure of delinquent filers pursuant to Item 405 of Regulation S-K is not contained herein, and will not be contained, to the best of registrant's knowledge, in definitive proxy or information statements incorporated by reference in Part III of this Form 10-K or any amendment to this Form 10-K. ☒

Indicate by check mark whether the Registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer or a smaller reporting company. See definition of "large accelerated filer," "accelerated filer" and "smaller reporting company" in Rule 12b-2 of the Exchange Act. (Check one):

Large accelerated filer ☒ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐
(Do not check if smaller reporting company)

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

The aggregate market value of Common Shares, no par value per share, held by nonaffiliates (based on the closing sale price on the Nasdaq Stock Market) as of April 30, 2016 was approximately $4,357,415,366.

There were 57,348,873 Common Shares outstanding as of November 30, 2016.

Documents incorporated by reference:

Portions of the Proxy Statement for the 2017 Annual Meeting — Part III

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PART I

NOTE REGARDING AMOUNTS AND FISCAL YEAR REFERENCES

In this annual report, all amounts related to United States dollars and foreign currency and to the number of Nordson Corporation's common shares, except for per share earnings and dividend amounts, are expressed in thousands. Unless the context otherwise indicates, all references to "we," "us," "our," or the "Company" mean Nordson Corporation.

Unless otherwise noted, all references to years relate to our fiscal year ending October 31.

Item 1. Business

General Description of Business

Nordson engineers, manufactures and markets differentiated products and systems used to dispense, apply and control adhesives, coatings, polymers, sealants, biomaterials, and other fluids, to test and inspect for quality, and to treat and cure surfaces. These products are supported with extensive application expertise and direct global sales and service. We serve a wide variety of consumer non-durable, consumer durable and technology end markets including packaging, nonwovens, electronics, medical, appliances, energy, transportation, building and construction, and general product assembly and finishing.

Our strategy for long-term growth is based on solving customers' needs globally. We are headquartered in Westlake, Ohio, and our products are marketed through a network of direct operations in more than 35 countries. Consistent with this global strategy, approximately 71 percent of our revenues were generated outside the United States in 2016.

We have 6,127 employees worldwide. Principal manufacturing facilities are located in the United States, the People's Republic of China, Germany, Mexico, the Netherlands, Thailand and the United Kingdom.

Corporate Purpose and Goals

We strive to be a vital, self-renewing, worldwide organization that, within the framework of ethical behavior and enlightened citizenship, grows and produces wealth for our customers, employees, shareholders and communities.

We operate for the purpose of creating balanced, long-term benefits for all of our constituencies.

Although every quarter may not produce increased sales, net income and earnings per share, or exceed the comparative prior year's quarter, we do expect to produce long-term gains. When short-term swings occur, we do not intend to alter our basic objectives in efforts to mitigate the impact of these temporary occurrences.

We drive organic growth by continually introducing new products and technology, providing high levels of customer service and support, capturing rapidly expanding opportunities in emerging geographies, and by leveraging existing technology into new applications. Additional growth comes through the acquisition of companies that serve international growth markets, share our business model characteristics and can leverage our global infrastructure.

We create benefits for our customers through a Package of Values®, which includes carefully engineered, durable products; strong service support; the backing of a well-established, worldwide company with financial and technical strengths; and a corporate commitment to deliver what was promised.

We strive to provide genuine customer satisfaction; it is the foundation upon which we continue to build our business.

Complementing our business strategy is the objective to provide opportunities for employee self-fulfillment, growth, security, recognition and equitable compensation. This goal is met through the Human Resources department's facilitation of employee training, leadership training and the creation of on-the-job growth opportunities. The result is a highly qualified and professional global team capable of meeting corporate objectives.

We recognize the value of employee participation in the planning process. Strategic and operating plans are developed by all business units, resulting in a sense of ownership and commitment on the part of employees in accomplishing our objectives.

We drive continuous improvement in all areas of the company through the Nordson Business System (NBS), our collected set of tools and best practices. Rooted in Lean Six Sigma methodologies, the NBS is applied throughout all business units and corporate functions. Closely tied to the NBS are a set of key performance indicators that help define and measure progress toward corporate goals. The NBS is underpinned by our timeless corporate values of customer passion, energy, excellence, integrity and respect for people.

We are an equal opportunity employer.

We are committed to contributing approximately five percent of domestic pretax earnings to human welfare services, education and other charitable activities, particularly in communities where we have significant operations.

Financial Information About Operating Segments, Foreign and Domestic Operations and Export Sales

In accordance with generally accepted accounting standards, we have reported information about our three operating segments, including information about our foreign and domestic operations. This information is contained in Note 16 of Notes to Consolidated Financial Statements, which can be found in Part II, Item 8 of this Annual Report.

Principal Products and Uses

We engineer, manufacture and market differentiated products and systems used to dispense, apply and control adhesives, coatings, polymers, sealants, biomaterials, and other fluids, to test and inspect for quality, and to treat and cure surfaces. Our technology-based systems can be found in manufacturing facilities around the world producing a wide range of goods for consumer durable, consumer non-durable and technology end markets. Equipment ranges from single-use components to manual, stand-alone units for low-volume operations to microprocessor-based automated systems for high-speed, high-volume production lines.

We market our products globally, primarily through a direct sales force, and also through qualified distributors and sales representatives. We have built a worldwide reputation for creativity and expertise in the design and engineering of high-technology application equipment that meets the specific needs of our customers. We create value for our customers by developing solutions that increase uptime, enable faster line speeds and reduce consumption of materials.

The following is a summary of the product lines and markets served by our operating segments:

1. **Adhesive Dispensing Systems**

   This segment delivers our proprietary precision dispensing and processing technology to diverse markets for applications that commonly reduce material consumption, increase line efficiency and enhance product strength, durability, brand and appearance.

   - ***Nonwovens*** — Dispensing, coating and laminating systems for applying adhesives, lotions, liquids and fibers to disposable products and continuous roll goods. Key strategic markets include adult incontinence products, baby diapers and child-training pants, feminine hygiene products and surgical drapes, gowns, shoe covers and face masks.
   - ***Packaging*** — Automated adhesive dispensing systems used in the rigid packaged goods industries. Key strategic markets include food and beverage packaging, pharmaceutical packaging, and other consumer goods packaging.
   - ***Polymer Processing*** — Components and systems used in the thermoplastic melt stream in plastic extrusion, injection molding, compounding, polymerization and recycling processes. Key strategic markets include flexible packaging, electronics, medical, building and construction, transportation and aerospace, and general consumer goods.
   - ***Product Assembly*** — Dispensing, coating and laminating systems for the assembly of plastic, metal and wood products, for paper and paperboard converting applications and for the manufacturing of continuous roll goods. Key strategic markets include appliances, automotive components, building and construction materials, electronics, furniture, solar energy, and the manufacturing of bags, sacks, books, envelopes and folding cartons.

2. Advanced Technology Systems

This segment integrates our proprietary product technologies found in progressive stages of a customer's production process, such as surface treatment, precisely controlled automated, semi-automated or manual dispensing of material, and post-dispense bond testing, optical inspection and X-ray inspection to ensure quality. Related single-use plastic molded syringes, cartridges, tips, tubing and fluid connection components are used to dispense or control fluids in production processes or within customers' end products. This segment primarily serves the specific needs of electronics, medical and related high-tech industries.

- ***Electronic Systems*** — Automated dispensing systems for high-speed, accurate application of a broad range of attachment, protection and coating fluids, and related gas plasma treatment systems for cleaning and conditioning surfaces prior to dispense. Key strategic markets include mobile phones, tablets, personal computers, wearable technology, liquid crystal displays, micro hard drives, microprocessors, printed circuit boards, micro-electronic mechanical systems (MEMS), and semiconductor packaging.
- ***Fluid Management*** — Precision manual and semi-automated dispensers, highly engineered single-use plastic molded syringes, cartridges, tips, fluid connection components, tubing and catheters. Products are used for applying and controlling the flow of adhesives, sealants, lubricants, and biomaterials in critical industrial production processes and within medical equipment and related surgical procedures. Key strategic markets include consumer goods, electronics, industrial assembly, and medical.
- ***Test and Inspection*** — Bond testing and automated optical and x-ray inspection systems used in the semiconductor and printed circuit board industries. Key strategic markets include mobile phones, tablets, personal computers, wearable technology, liquid crystal displays, micro hard drives, microprocessors, printed circuit boards, MEMS, and semiconductor packaging.

3. Industrial Coating Systems

This segment provides both standard and highly-customized equipment used primarily for applying coatings, paint, finishes, sealants and other materials, and for curing and drying of dispensed material. This segment primarily serves the consumer durables market.

- ***Cold Materials*** — Automated and manual dispensing products and systems used to apply multiple component adhesive and sealant materials in the general industrial and transportation manufacturing industries. Key strategic markets include aerospace, alternative energy, appliances, automotive, building and construction, composites, electronics and medical.
- ***Container Coating*** — Automated and manual dispensing and curing systems used to coat and cure containers. Key strategic markets include beverage containers and food cans.
- ***Curing and Drying Systems*** — Ultraviolet equipment used primarily in curing and drying operations for specialty coatings, semiconductor materials and paints. Key strategic markets include electronics, containers, and durable goods products.
- ***Liquid Finishing*** — Automated and manual dispensing systems used to apply liquid paints and coatings to consumer and industrial products. Key strategic markets include automotive components, agriculture, construction, metal shelving and drums.
- ***Powder Coating*** — Automated and manual dispensing systems used to apply powder paints and coatings to a variety of metal, plastic and wood products. Key strategic markets include agriculture and construction equipment, appliances, automotive components, home and office furniture, lawn and garden equipment, pipe coating, and wood and metal shelving.

Manufacturing and Raw Materials

Our production operations include machining, molding and assembly. We manufacture specially designed parts and assemble components into finished equipment. Many components are made in standard modules that can be used in more than one product or in combination with other components for a variety of models. We have principal manufacturing operations and sources of supply in the United States in Ohio, Georgia, California, Colorado, Michigan, New Jersey, North Carolina, Pennsylvania, Rhode Island, Virginia and Wisconsin; as well as in the People's Republic of China, Germany, Mexico, the Netherlands, Thailand and the United Kingdom.

Principal materials used to make our products are metals and plastics, typically in sheets, bar stock, castings, forgings, tubing and pellets. We also purchase many electrical and electronic components, fabricated metal parts, high-pressure fluid hoses, packings, seals and other items integral to our products. Suppliers are competitively selected based on cost, quality and service. All significant raw materials that we use are available through multiple sources.

Senior operating executives supervise an extensive quality control program for our equipment, machinery and systems, and manufacturing processes.

Natural gas and other fuels are our primary energy sources. However, standby capacity for alternative sources is available if needed.

Intellectual Property

We maintain procedures to protect our intellectual property (including patents, trademarks and copyrights) both domestically and internationally. Risk factors associated with our intellectual property are discussed in Item 1A, Risk Factors.

Our intellectual property portfolios include valuable patents, trade secrets, know-how, domain names, trademarks and trade names. As of October 31, 2016, we held 541 United States patents and 1,207 foreign patents and had 212 United States patent applications pending and 878 foreign patent applications pending, but there is no assurance that any patent application will be issued. We continue to apply for and obtain patent protection for new products on an ongoing basis.

Patents covering individual products extend for varying periods according to the date of filing or grant and legal term of patents in various countries where a patent is obtained. Our current patent portfolio has expiration dates ranging from November 2016 to February 2041. The actual protection a patent provides, which can vary from country to country, depends upon the type of patent, the scope of its coverage, and the availability of legal remedies in each country. We believe, however, that the duration of our patents generally exceeds the life cycles of the technologies disclosed and claimed in the patents.

We believe our trademarks are important assets and we aggressively manage our brands. We also own a number of trademarks in the United States and foreign countries, including registered trademarks for Nordson, Asymtek, Dage, EFD, Value Plastics, and Xaloy and various common law trademarks which are important to our business, inasmuch as they identify Nordson and our products to our customers. As of October 31, 2016, we had a total of 2,084 trademark registrations in the United States and in various foreign countries.

We rely upon a combination of nondisclosure and other contractual arrangements and trade secret laws to protect our proprietary rights and also enter into confidentiality and intellectual property agreements with our employees that require them to disclose any inventions created during employment, convey all rights to inventions to us, and restrict the distribution of proprietary information.

We protect and promote our intellectual property portfolio and take those actions we deem appropriate to enforce our intellectual property rights and to defend our right to sell our products. Although in aggregate our intellectual property is important to our operations, we do not believe that the loss of any one patent, trademark, or group of related patents or trademarks would have a material adverse effect on our results of operations or financial position of our overall business.

Seasonal Variation in Business

Generally, the highest volume of sales occurs in the second half of the year due in large part to the timing of customers' capital spending programs. Accordingly, first quarter sales volume is typically the lowest of the year due to timing of customers' capital spending programs and customer holiday shutdowns.

Working Capital Practices

No special or unusual practices affect our working capital. We generally require advance payments as deposits on customized equipment and systems and, in certain cases, require progress payments during the manufacturing of these products. We continue to initiate new processes focused on reduction of manufacturing lead times, resulting in lower investment in inventory while maintaining the capability to respond promptly to customer needs.

Customers

We serve a broad customer base, both in terms of industries and geographic regions. In 2016, no single customer accounted for ten percent or more of sales.

Backlog

Our backlog of open orders increased to approximately $274,000 at October 31, 2016 from approximately $228,000 at October 31, 2015. The amounts for both years were calculated based upon exchange rates in effect at October 31, 2016. The increase is primarily due to orders within the Advanced Technology Systems segment. All orders in the 2016 year-end backlog are expected to be shipped to customers in 2017.

Government Contracts

Our business neither includes nor depends upon a significant amount of governmental contracts or subcontracts. Therefore, no material part of our business is subject to renegotiation or termination at the option of the government.

Competitive Conditions

Our equipment is sold in competition with a wide variety of alternative bonding, sealing, finishing, coating, processing, testing, inspecting, and fluid control techniques. Potential uses for our equipment include any production processes that require preparation, modification or curing of surfaces; dispensing, application, processing or control of fluids and materials; or testing and inspecting for quality.

Many factors influence our competitive position, including pricing, product quality and service. We maintain a leadership position in our business segments by delivering high-quality, innovative products and technologies, as well as service and technical support. Working with customers to understand their processes and developing the application solutions that help them meet their production requirements also contributes to our leadership position. Our worldwide network of direct sales and technical resources also is a competitive advantage.

Research and Development

Investments in research and development are important to our long-term growth, enabling us to keep pace with changing customer and marketplace needs through the development of new products and new applications for existing products. We place strong emphasis on technology developments and improvements through internal engineering and research teams. Research and development expenses were approximately $46,247 in 2016, compared with approximately $46,689 in 2015 and $47,536 in 2014. As a percentage of sales, research and development expenses were approximately 2.6, 2.8 and 2.8 percent in 2016, 2015 and 2014, respectively.

Environmental Compliance

We are subject to federal, state, local and foreign environmental, safety and health laws and regulations concerning, among other things, emissions to the air, discharges to land and water and the generation, handling, treatment and disposal of hazardous waste and other materials. Under certain of these laws, we can be held strictly liable for hazardous substance contamination of any real property we have ever owned, operated or used as a disposal site or for natural resource damages associated with such contamination. We are also required to maintain various related permits and licenses, many of which require periodic modification and renewal. The operation of manufacturing plants unavoidably entails environmental, safety and health risks, and we could incur material unanticipated costs or liabilities in the future if any of these risks were realized in ways or to an extent that we did not anticipate.

We believe that we operate in compliance, in all material respects, with applicable environmental laws and regulations. Compliance with environmental laws and regulations requires continuing management effort and expenditures. We have incurred, and will continue to incur, costs and capital expenditures to comply with these laws and regulations and to obtain and maintain the necessary permits and licenses. We believe that the cost of complying with environmental laws and regulations will not have a material effect on our earnings, liquidity or competitive position but cannot assure that material compliance-related costs and expenses may not arise in the future. For example, future adoption of new or amended environmental laws, regulations or requirements or newly discovered contamination or other circumstances that could require us to incur costs and expenses that may have a material effect, but cannot be presently anticipated.

We believe that policies, practices and procedures have been properly designed to prevent unreasonable risk of material environmental damage arising from our operations. We accrue for estimated environmental liabilities with charges to expense and believe our environmental accrual is adequate to provide for our portion of the costs of all such known environmental liabilities. Compliance with federal, state, local and foreign environmental protection laws during 2016 had no material effect on our capital expenditures, earnings or competitive position. Based upon consideration of currently available information, we believe liabilities for environmental matters will not have a material adverse effect on our financial position, operating results or liquidity, but we cannot assure that material environmental liabilities may not arise in the future.

Employees

As of October 31, 2016, we had 6,127 full-time and part-time employees, including 149 at our Amherst, Ohio, facility who are represented by a collective bargaining agreement that expires on November 3, 2019 and 37 at our New Castle, Pennsylvania facility who are represented by collective bargaining agreements that expire on August 31, 2017. No work stoppages have been experienced at any of our facilities during any of the periods covered by this report.

Available Information

Our proxy statement, annual report to the Securities and Exchange Commission (Form 10-K), quarterly reports (Form 10-Q) and current reports (Form 8-K) and amendments to those reports filed or furnished pursuant to Section 13(a) or 15(d) of the Securities Exchange Act of 1934 are available free of charge at http://www.nordson.com/investors as soon as reasonably practical after such material is electronically filed with, or furnished to, the SEC. Copies of these reports may also be obtained free of charge by sending written requests to Corporate Communications, Nordson Corporation, 28601 Clemens Road, Westlake, Ohio 44145. The contents of our Internet website are not incorporated by reference herein and are not deemed to be a part of this report.

Item 1A. Risk Factors

In an enterprise as diverse as ours, a wide range of factors could affect future performance. We discuss in this section some of the risk factors that, if they actually occurred, could materially and adversely affect our business, financial condition, value and results of operations. You should consider these risk factors in connection with evaluating the forward-looking statements contained in this Annual Report on Form 10-K because these factors could cause our actual results and financial condition to differ materially from those projected in forward-looking statements.

The significant risk factors affecting our operations include the following:

Changes in United States or international economic conditions could adversely affect the profitability of any of our operations.

In 2016, approximately 29 percent of our revenue was generated in the United States, while approximately 71 percent was generated outside the United States. Our largest markets include appliance, automotive, construction, container, electronics assembly, food and beverage, furniture, medical, metal finishing, nonwovens, packaging, paper and paperboard converting, plastics processing and semiconductor. A slowdown in any of these specific end markets could directly affect our revenue stream and profitability.

A portion of our product sales is attributable to industries and markets, such as the semiconductor, mobile electronics, polymer processing and metal finishing industries, which historically have been cyclical and sensitive to relative changes in supply and demand and general economic conditions. The demand for our products depends, in part, on the general economic conditions of the industries or national economies of our customers. Downward economic cycles in our customers' industries or countries may reduce sales of some of our products. It is not possible to predict accurately the factors that will affect demand for our products in the future.

Any significant downturn in the health of the general economy, globally, regionally or in the markets in which we sell products, could have an adverse effect on our revenues and financial performance, resulting in impairment of assets.

Significant movements in foreign currency exchange rates or change in monetary policy may harm our financial results.

We are exposed to fluctuations in foreign currency exchange rates, particularly with respect to the euro, the yen, the pound sterling and the Chinese yuan. Any significant change in the value of the currencies of the countries in which we do business against the United States dollar could affect our ability to sell products competitively and control our cost structure, which could have a material adverse effect on our business, financial condition and results of operations. For additional detail related to this risk, see Item 7A, Quantitative and Qualitative Disclosure About Market Risk.

The majority of our consolidated revenues in 2016 were generated in currencies other than the United States dollar, which is our reporting currency. We recognize foreign currency transaction gains and losses arising from our operations in the period incurred. As a result, currency fluctuations between the United States dollar and the currencies in which we do business have caused and will continue to cause foreign currency transaction and translation gains and losses, which historically have been material and could continue to be material. We cannot predict the effects of exchange rate fluctuations upon our future operating results because of the number of currencies involved, the variability of currency exposures and the potential volatility of currency exchange rates. We take actions to manage our foreign currency exposure, such as entering into hedging transactions, where available, but we cannot assure that our strategies will adequately protect our consolidated operating results from the effects of exchange rate fluctuations. For example, the announcement of Brexit caused volatility in global currency exchange rate fluctuations that resulted in the strengthening of the United States dollar against foreign currencies in which we conduct business. Future adverse consequences arising from Brexit may include continued volatility in exchange rates. Any significant fluctuation in exchange rates may be harmful to our financial condition and results of operations. We also face risks arising from the imposition of exchange controls and currency devaluations. Exchange controls may limit our ability to convert foreign currencies into United States dollars or to remit dividends and other payments by our foreign subsidiaries or customers located in or conducting business in a country imposing controls. Currency devaluations diminish the United States dollar value of the currency of the country instituting the devaluation and, if they occur or continue for significant periods, could adversely affect our earnings or cash flow.

If we fail to develop new products, or our customers do not accept the new products we develop, our revenue and profitability could be adversely impacted.

Innovation is critical to our success. We believe that we must continue to enhance our existing products and to develop and manufacture new products with improved capabilities in order to continue to be a leading provider of precision technology solutions for the industrial equipment market. We also believe that we must continue to make improvements in our productivity in order to maintain our competitive position. Difficulties or delays in research, development or production of new products or failure to gain market acceptance of new products and technologies may reduce future sales and adversely affect our competitive position. We continue to invest in the development and marketing of new products. There can be no assurance that we will have sufficient resources to make such investments, that we will be able to make the technological advances necessary to maintain competitive advantages or that we can recover major research and development expenses. If we fail to make innovations, launch products with quality problems or the market does not accept our new products, our financial condition, results of operations, cash flows and liquidity could be adversely affected. In addition, as new or enhanced products are introduced, we must successfully manage the transition from older products to minimize disruption in customers' ordering patterns, avoid excessive levels of older product inventories and ensure that we can deliver sufficient supplies of new products to meet customers' demands.

Our growth strategy includes acquisitions, and we may not be able to execute on our acquisition strategy or integrate acquisitions successfully.

Our recent historical growth has depended, and our future growth is likely to continue to depend, in part on our acquisition strategy and the successful integration of acquired businesses into our existing operations. We intend to continue to seek additional acquisition opportunities both to expand into new markets and to enhance our position in existing markets throughout the world. We cannot assure we will be able to successfully identify suitable acquisition opportunities, prevail against competing potential acquirers, negotiate appropriate acquisition terms, obtain financing that may be needed to consummate such acquisitions, complete proposed acquisitions, successfully integrate acquired businesses into our existing operations or expand into new markets. In addition, we cannot assure that any acquisition, once successfully integrated, will perform as planned, be accretive to earnings, or prove to be beneficial to our operations and cash flow.

The success of our acquisition strategy is subject to other risks and uncertainties, including:

- our ability to realize operating efficiencies, synergies or other benefits expected from an acquisition, and possible delays in realizing the benefits of the acquired company or products;
- diversion of management's time and attention from other business concerns;
- difficulties in retaining key employees, customers or suppliers of the acquired business;
- difficulties in maintaining uniform standards, controls, procedures and policies throughout acquired companies;
- adverse effects on existing business relationships with suppliers or customers;
- the risks associated with the assumption of contingent or undisclosed liabilities of acquisition targets; and
- the ability to generate future cash flows or the availability of financing.

In addition, an acquisition could adversely impact our operating performance as a result of the incurrence of acquisition-related debt, pre-acquisition potential tax liabilities, acquisition expenses, the amortization of acquisition-acquired assets, or possible future impairments of goodwill or intangible assets associated with the acquisition.

We may also face liability with respect to acquired businesses for violations of environmental laws occurring prior to the date of our acquisition, and some or all of these liabilities may not be covered by environmental insurance secured to mitigate the risk or by indemnification from the sellers from which we acquired these businesses. We could also incur significant costs, including, but not limited to, remediation costs, natural resources damages, civil or criminal fines and sanctions and third-party claims, as a result of past or future violations of, or liabilities associated with environmental laws.

Increased IT security threats and more sophisticated and targeted computer crime could pose a risk to our systems, networks, products, solutions and services.

Increased global IT security threats and more sophisticated and targeted computer crime pose a risk to the security of our systems and networks and the confidentiality, availability and integrity of our data. While we attempt to mitigate these risks by employing a number of measures, including employee training, comprehensive monitoring of our networks and systems, and maintenance of backup and protective systems, our systems, networks, products, solutions and services remain potentially vulnerable to advanced persistent threats. Depending on their nature and scope, such threats could potentially lead to the compromising of confidential information, including but not limited to confidential information relating to customer or employee data, improper use of our systems and networks, manipulation and destruction of data, defective products, production downtimes and operational disruptions, which in turn could adversely affect our reputation, competitiveness and results of operations.

If our intellectual property protection is inadequate, others may be able to use our technologies and tradenames and thereby reduce our ability to compete, which could have a material adverse effect on us, our financial condition and results of operations.

We regard much of the technology underlying our products and the trademarks under which we market our products as proprietary. The steps we take to protect our proprietary technology may be inadequate to prevent misappropriation of our technology, or third parties may independently develop similar technology. We rely on a combination of patents, trademark, copyright and trade secret laws, employee and third-party non-disclosure agreements and other contracts to establish and protect our technology and other intellectual property rights. The agreements may be breached or terminated, and we may not have adequate remedies for any breach, and existing trade secrets, patent and copyright law afford us limited protection. Policing unauthorized use of our intellectual property is difficult. A third party could copy or otherwise obtain and use our products or technology without authorization. Litigation may be necessary for us to defend against claims of infringement or to protect our intellectual property rights and could result in substantial cost to us and diversion of our efforts. Further, we might not prevail in such litigation, which could harm our business.

Our products could infringe on the intellectual property of others, which may cause us to engage in costly litigation and, if we are not successful, could cause us to pay substantial damages and prohibit us from selling our products.

Third parties may assert infringement or other intellectual property claims against us based on their patents or other intellectual property claims, and we may have to pay substantial damages, possibly including treble damages, if it is ultimately determined our products infringe. We may have to obtain a license to sell our products if it is determined that our products infringe upon another party's intellectual property. We might be prohibited from selling our products before we obtain a license, which, if available at all, may require us to pay substantial royalties. Even if infringement claims against us are without merit, defending these types of lawsuits takes significant time, may be expensive and may divert management attention from other business concerns.

Any impairment in the value of our intangible assets, including goodwill, would negatively affect our operating results and total capitalization.

Our total assets reflect substantial intangible assets, primarily goodwill. The goodwill results from our acquisitions and represents the excess of cost over the fair value of the identifiable net assets we acquired. We assess at least annually whether there has been any impairment in the value of our intangible assets. If future operating performance at one or more of our business units were to fall significantly below current levels, if competing or alternative technologies emerge, if market conditions for acquired businesses decline, if significant and prolonged negative industry or economic trends exist, if our stock price and market capitalization declines, or if future cash flow estimates decline, we could incur, under current applicable accounting rules, a non-cash charge to operating earnings for goodwill impairment. Any determination requiring the write-off of a significant portion of unamortized intangible assets would negatively affect our results of operations and equity book value, the effect of which could be material.

We may be exposed to liabilities under the Foreign Corrupt Practices Act (FCPA), which could have a material adverse effect on our business.

We are subject to compliance with various laws and regulations, including the FCPA and similar worldwide anti-bribery and anti-corruption laws, which generally prohibit companies and their intermediaries from engaging in bribery or making other improper payments to private or public parties for the purpose of obtaining or retaining business or gaining an unfair business advantage. The FCPA also requires proper record keeping and characterization of such payments in our reports filed with the SEC. Our employees are trained and required to comply with these laws, and we are committed to legal compliance and corporate ethics. Violations of these laws could result in severe criminal or civil sanctions and financial penalties and other consequences that may have a material adverse effect on our business, reputation, financial condition or results of operations.

Inability to access capital could impede growth or the repayment or refinancing of existing indebtedness.

The limits imposed on us by the restrictive covenants contained in our credit facilities could prevent us from making acquisitions or cause us to lose access to these facilities.

Our existing credit facilities contain restrictive covenants that limit our ability to, among other things:

- borrow money or guarantee the debts of others;
- use assets as security in other transactions;
- make restricted payments or distributions; and
- sell or acquire assets or merge with or into other companies.

In addition, our credit facilities require us to meet financial ratios, including a “Leverage Ratio” and an “Interest Coverage Ratio”, both as defined in the credit facilities.

These restrictions could limit our ability to plan for or react to market conditions or meet extraordinary capital needs and could otherwise restrict our financing activities.

Our ability to comply with the covenants and other terms of our credit facilities will depend on our future operating performance. If we fail to comply with such covenants and terms, we may be in default and the maturity of the related debt could be accelerated and become immediately due and payable. We may be required to obtain waivers from our lenders in order to maintain compliance under our credit facilities, including waivers with respect to our compliance with certain financial covenants. If we are unable to obtain necessary waivers and the debt under our credit facilities is accelerated, we would be required to obtain replacement financing at prevailing market rates.

We may need new or additional financing in the future to expand our business or refinance existing indebtedness. If we are unable to access capital on satisfactory terms and conditions, we may not be able to expand our business or meet our payment requirements under our existing credit facilities. Our ability to obtain new or additional financing will depend on a variety of factors, many of which are beyond our control. We may not be able to obtain new or additional financing because we have substantial debt or because we may not have sufficient cash flow to service or repay our existing or future debt. In addition, depending on market conditions and our financial performance, neither debt nor equity financing may be available on satisfactory terms or at all. Finally, as a consequence of worsening financial market conditions, our credit facility providers may not provide the agreed credit if they become undercapitalized.

Changes in interest rates could adversely affect us.

Any period of interest rate increases may also adversely affect our profitability. At October 31, 2016, we had $984,787 of total debt and notes payable outstanding, of which 64 percent was priced at interest rates that float with the market. A one percent increase in the interest rate on the floating rate debt in 2016 would have resulted in approximately $7,205 of additional interest expense. A higher level of floating rate debt would increase the exposure to changes in interest rates. For additional detail related to this risk, see Item 7A, Quantitative and Qualitative Disclosure About Market Risk.

Failure to retain our existing senior management team or the inability to attract and retain qualified personnel could hurt our business and inhibit our ability to operate and grow successfully.
Our success will continue to depend to a significant extent on the continued service of our executive management team and the ability to recruit, hire and retain other key management personnel to support our growth and operational initiatives and replace executives who retire or resign. Failure to retain our leadership team and attract and retain other important management and technical personnel could place a constraint on our global growth and operational initiatives, possibly resulting in inefficient and ineffective management and operations, which would likely harm our revenues, operations and product development efforts and eventually result in a decrease in profitability.

The level of returns on pension plan assets and changes in the actuarial assumptions used could adversely affect us.
Our operating results may be positively or negatively impacted by the amount of expense we record for our defined benefit pension plans. U.S. GAAP requires that we calculate pension expense using actuarial valuations, which are dependent upon our various assumptions including estimates of expected long-term rate of return on plan assets, discount rates for future payment obligations, and the expected rate of increase in future compensation levels. Our pension expense and funding requirements may also be affected by our actual return on plan assets and by legislation and other government regulatory actions. Changes in assumptions, laws or regulations could lead to variability in operating results and could have a material adverse impact on liquidity.

Regulations related to conflict-free minerals may result in additional expenses that could affect our financial condition and business operations.
Pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act, the SEC promulgated final rules regarding disclosure of the use of certain minerals, known as conflict minerals, which are mined from the Democratic Republic of the Congo and adjoining countries, as well as procedures regarding a manufacturer's efforts to prevent the sourcing of such minerals and metals produced from those minerals. These new disclosure obligations will require continuing due diligence efforts to support our future disclosure requirements. We incurred and will continue to incur costs associated with complying with such disclosure requirements, including costs associated with canvassing our supply chain to determine the source country of any conflict minerals incorporated in our products, in addition to the cost of remediation and other changes to products, processes, or sources of supply as a consequence of such verification activities. In addition, the implementation of these rules could adversely affect the sourcing, supply, and pricing of materials used in our products.

Political conditions in foreign countries in which we operate could adversely affect us.
We conduct our manufacturing, sales and distribution operations on a worldwide basis and are subject to risks associated with doing business outside the United States. In 2016, approximately 71 percent of our total sales were generated outside the United States. We expect that international operations and United States export sales will continue to be important to our business for the foreseeable future. Both sales from international operations and export sales are subject in varying degrees to risks inherent in doing business outside the United States. Such risks include, but are not limited to, the following:

- risks of economic instability;
- unanticipated or unfavorable circumstances arising from host country laws or regulations;
- threats of war, terrorism or governmental instability;
- significant foreign and U.S. taxes on repatriated cash;
- restrictions on the transfer of funds into or out of a country;
- potential negative consequences from changes to taxation policies;
- the disruption of operations from labor and political disturbances;
- the imposition of tariffs, import or export licensing requirements; and
- exchange controls or other trade restrictions including transfer pricing restrictions when products produced in one country are sold to an affiliated entity in another country.

Any of these events could reduce the demand for our products, limit the prices at which we can sell our products, interrupt our supply chain, or otherwise have an adverse effect on our operating performance.

Our international operations also depend upon favorable trade relations between the U.S. and those foreign countries in which our customers, subcontractors and materials suppliers have operations. A protectionist trade environment in either the U.S. or those foreign countries in which we do business, such as a change in the current tariff structures, export compliance or other trade policies, may materially and adversely affect our ability to sell our products in foreign markets.

Our business and operating results may be adversely affected by natural disasters or other catastrophic events beyond our control.
While we have taken precautions to prevent production and service interruptions at our global facilities, severe weather conditions such as hurricanes or tornadoes, as well major earthquakes and other natural disasters, in areas in which we have manufacturing facilities or from which we obtain products may cause physical damage to our properties, closure of one or more of our manufacturing or distribution facilities, lack of an adequate work force in a market, temporary disruption in the supply of inventory, disruption in the transport of products and utilities, and delays in the delivery of products to our customers. Any of these factors may disrupt our operations and adversely affect our financial condition and results of operations.

The insurance that we maintain may not fully cover all potential exposures.
We maintain property, business interruption and casualty insurance but such insurance may not cover all risks associated with the hazards of our business and is subject to limitations, including deductibles and maximum liabilities covered. We are potentially at risk if one or more of our insurance carriers fail. Additionally, severe disruptions in the domestic and global financial markets could adversely impact the ratings and survival of some insurers. In the future, we may not be able to obtain coverage at current levels, and our premiums may increase significantly on coverage that we maintain.

Item 1B. Unresolved Staff Comments

None.

Item 2. Properties

The following table summarizes our principal properties as of October 31, 2016:

Location	Description of Property	Approximate Square Feet
Amherst, Ohio [2, 3]	A manufacturing, laboratory and office complex	521,000
Carlsbad, California [2]	Three manufacturing and office buildings (leased)	181,000
Duluth, Georgia [1]	A manufacturing, laboratory and office building	176,000
Chippewa Falls, Wisconsin [1]	Three manufacturing, warehouse, and office buildings (leased)	151,000
Swainsboro, Georgia [1]	A manufacturing building (leased)	136,000
East Providence, Rhode Island [2]	A manufacturing, warehouse and office building	116,000
Loveland, Colorado [2]	A manufacturing, warehouse and office building	115,000
Pulaski, Virginia [1]	A manufacturing, warehouse and office building	101,000
Robbinsville, New Jersey [2]	A manufacturing, warehouse and office building (leased)	88,000
New Castle, Pennsylvania [1]	A manufacturing, warehouse and office building	76,000
Youngstown, Ohio [1]	A manufacturing, warehouse and office building (leased)	58,000
Vista, California [2]	A manufacturing building (leased)	41,000
Hickory, North Carolina [1]	A manufacturing, warehouse and office building (leased)	41,000
Rancho Dominguez, California [2]	A manufacturing and office building (leased)	40,000
Plymouth, Michigan [3]	Two manufacturing, warehouse and office buildings (leased)	35,000
Westlake, Ohio	Corporate headquarters	28,000
Concord, California [2]	A manufacturing and office building (leased)	11,000
San Diego, California [2]	A manufacturing and office building (leased)	7,000
Shanghai, China [1, 3]	Four manufacturing, warehouse and office buildings (leased)	311,000
Lüneburg, Germany [1]	A manufacturing and laboratory building	129,000
Münster, Germany [1]	Four manufacturing, warehouse and office building (leased)	112,000
Shanghai, China [1, 2, 3]	Two office, laboratory and engineering buildings	110,000
Guaymas, Mexico [2]	Two manufacturing, warehouse and office buildings (leased)	71,000
Bangalore, India [1, 2, 3]	A manufacturing, warehouse and office building	56,000
Maastricht, Netherlands [1, 2, 3]	A manufacturing, warehouse and office building	54,000
Chonburi, Thailand [1]	A manufacturing, warehouse and office building	52,000
Tokyo, Japan [1, 2, 3]	Three office, laboratory and warehouse buildings (leased)	49,000
Erkrath, Germany [1, 2, 3]	An office, laboratory and warehouse building (leased)	48,000
Deurne, Netherlands [2]	A manufacturing, warehouse and office building (leased)	46,000
Temse, Belgium [1]	A manufacturing, warehouse and office building (leased)	43,000
Suzhou, China [2]	A manufacturing, warehouse and office building (leased)	42,000
Aylesbury, U.K. [1, 2]	A manufacturing, warehouse and office building (leased)	36,000
Seongnam-City, South Korea [1, 2, 3]	An office, laboratory and warehouse building (leased)	35,000
Pirmasens, Germany [1]	A manufacturing, warehouse and office building (leased)	32,000
Sao Paulo, Brazil [1, 2, 3]	An office, laboratory and warehouse building (leased)	23,000
El Marques, Mexico [1, 2, 3]	A warehouse and office building (leased)	22,000
Munich, Germany [2]	An office, laboratory and warehouse building (leased)	21,000
Singapore [1, 2, 3]	Two warehouse and office buildings (leased)	16,000
Billerbeck, Germany [1]	An office and warehouse building (leased)	16,000
Lagny Sur Marne, France [1, 3]	An office building (leased)	6,000
Segrate, Italy [1, 3]	An office, laboratory and warehouse building (leased)	5,000

Business Segment — Property Identification Legend

1 — Adhesive Dispensing Systems
2 — Advanced Technology Systems
3 — Industrial Coating Systems

The facilities listed have adequate, suitable and sufficient capacity (production and nonproduction) to meet present and foreseeable demand for our products.

Other properties at international subsidiary locations and at branch locations within the United States are leased. Lease terms do not exceed 25 years and generally contain a provision for cancellation with some penalty at an earlier date. Information about leases is reported in Note 11 of Notes to Consolidated Financial Statements that can be found in Part II, Item 8 of this document.

Item 3. Legal Proceedings

We are involved in pending or potential litigation regarding environmental, product liability, patent, contract, employee and other matters arising from the normal course of business. Including the environmental matter discussed below, after consultation with legal counsel, we believe that the probability is remote that losses in excess of the amounts we have accrued would have a material adverse effect on our financial condition, quarterly or annual operating results or cash flows.

Environmental — We have voluntarily agreed with the City of New Richmond, Wisconsin and other Potentially Responsible Parties to share costs associated with the remediation of the City of New Richmond municipal landfill (the "Site") and constructing a potable water delivery system serving the impacted area down gradient of the Site. At October 31, 2016 and 2015, our accrual for the ongoing operation, maintenance and monitoring obligation at the Site was $516 and $565, respectively.

The liability for environmental remediation represents management's best estimate of the probable and reasonably estimable undiscounted costs related to known remediation obligations. The accuracy of our estimate of environmental liability is affected by several uncertainties such as additional requirements that may be identified in connection with remedial activities, the complexity and evolution of environmental laws and regulations, and the identification of presently unknown remediation requirements. Consequently, our liability could be different than our current estimate. However, we do not expect that the costs associated with remediation will have a material adverse effect on our financial condition or results of operations.

Item 4. Mine Safety Disclosures

None.

Executive Officers of the Company

Our executive officers as of October 31, 2016, were as follows:

Name	Age	Officer Since	Position or Office with The Company and Business Experience During the Past Five (5) Year Period
Michael F. Hilton	62	2010	President and Chief Executive Officer, 2010
John J. Keane	55	2003	Senior Vice President, 2005
Gregory P. Merk	45	2006	Senior Vice President, 2013 Vice President, 2006
Gregory A. Thaxton	55	2007	Senior Vice President, Chief Financial Officer, 2012 Vice President, Chief Financial Officer, 2008
Douglas C. Bloomfield	57	2005	Vice President, 2005
James E. DeVries	57	2012	Vice President, 2012 Vice President, Global Continuous Improvement, 2011
Shelly M. Peet	51	2007	Vice President, 2009
Jeffrey A. Pembroke	49	2015	Vice President, 2015
Joseph Stockunas	56	2015	Vice President, 2015
Robert E. Veillette	64	2007	Vice President, General Counsel and Secretary, 2007

PART II

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

Market Information and Dividends

(a) Our common shares are listed on the Nasdaq Global Select Market under the symbol NDSN. As of November 30, 2016, there were 1,494 registered shareholders. The table below is a summary of dividends paid per common share and the range of high and low sales prices during each quarter of 2016 and 2015.

Quarters	Dividend Paid	Common Share Price	
		High	Low
2016:			
First	**$.24**	**$ 74.24**	**$51.89**
Second	**.24**	**80.50**	**56.63**
Third	**.24**	**89.42**	**74.49**
Fourth	**.27**	**102.57**	**87.63**
2015:			
First	$.22	$ 80.42	$71.58
Second	.22	81.05	72.10
Third	.22	84.45	71.75
Fourth	.24	75.95	58.52

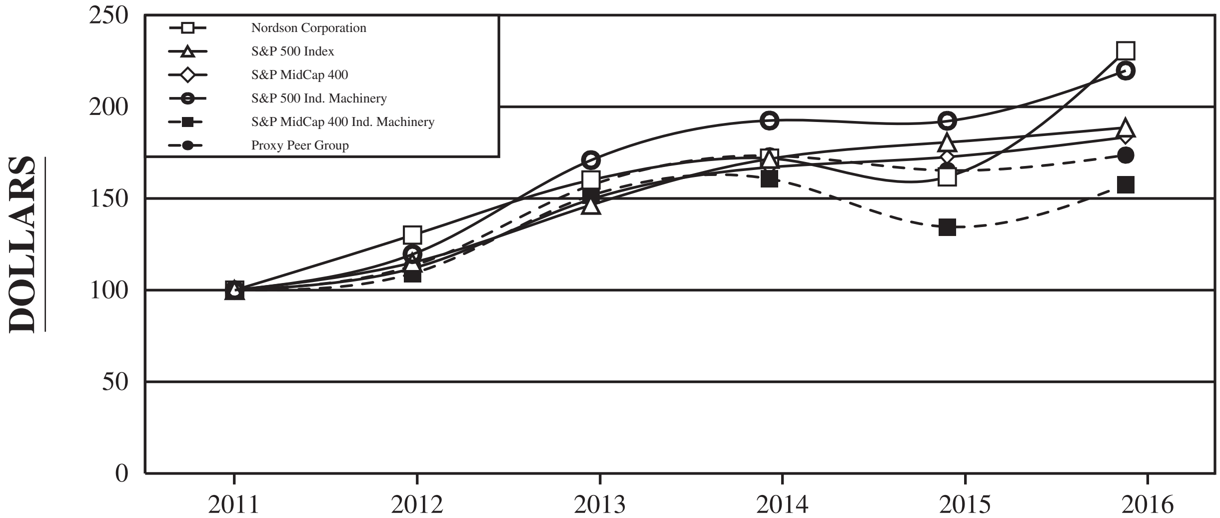
Source: NASDAQ OMX

While we have historically paid dividends to shareholders of our common stock on a quarterly basis, the declaration and payment of future dividends will depend on many factors, including but not limited to, our earnings, financial condition, business development needs and regulatory considerations, and are at the discretion of our board of directors.

Performance Graph

The following is a graph that compares the five-year cumulative return, calculated on a dividend-reinvested basis, from investing $100 on November 1, 2011 in Nordson common shares, the S&P 500 Index, the S&P MidCap 400 Index, the S&P 500 Industrial Machinery Index, the S&P MidCap 400 Industrial Machinery Index and our Proxy Peer Group, which includes: AIN, AME, ATU, B, CLC, DCI, ENTG, ESL, FLIR, GGG, GTLS, IEX, ITT, LECO, ROP, TER, WTS, and WWD.

COMPARISON OF CUMULATIVE RETURN



ASSUMES $100 INVESTED ON NOV. 01, 2011
ASSUMES DIVIDENDS REINVESTED
FISCAL YEAR ENDING OCT. 31, 2016

Company/Market/Peer Group	2011	2012	2013	2014	2015	2016
Nordson Corporation	$100.00	$129.96	$160.22	$171.87	$161.91	$230.59
S&P 500 Index	$100.00	$115.21	$146.52	$171.82	$180.75	$188.90
S&P MidCap 400	$100.00	$112.11	$149.64	$167.08	$172.80	$183.61
S&P 500 Ind. Machinery	$100.00	$119.68	$170.88	$192.70	$192.41	$219.70
S&P MidCap 400 Ind. Machinery	$100.00	$109.21	$151.63	$160.68	$134.50	$157.85
Proxy Peer Group	$100.00	$113.38	$157.20	$173.54	$165.40	$173.92

Source: Zack's Investment Research

(b) Use of Proceeds. Not applicable.

(c) Issuer Purchases of Equity Securities

	Total Number of Shares Repurchased	Average Price Paid per Share	Total Number of Shares Repurchased as Part of Publicly Announced Plans or Programs	Maximum Value of Shares That May Yet Be Purchased Under the Plans or Programs
August 1, 2016 to August 31, 2016	—	$—	—	$118,971
September 1, 2016 to September 30, 2016	—	$—	—	$118,971
October 1, 2016 to October 31, 2016	—	$—	—	$118,971
Total	—		—	

In December 2014, the board of directors authorized a new $300,000 common share repurchase program. This program replaced the $200,000 program approved by the board in August 2013. In August 2015, the board of directors authorized the repurchase of up to an additional $200,000 of the Company's common shares. This new authorization added capacity to the board's December 2014 authorization to repurchase $300,000 of shares. Approximately $118,971 remained available for share repurchases at October 31, 2016. Uses for repurchased shares include the funding of benefit programs including stock options, restricted stock and 401(k) matching. Shares purchased are treated as treasury shares until used for such purposes. The repurchase program is being funded using cash from operations and proceeds from borrowings under our credit facilities.

Item 6. Selected Financial Data

Five-Year Summary

(In thousands except for per-share amounts)	2016	2015	2014	2013	2012
Operating Data[(a)]					
Sales	**$1,808,994**	$1,688,666	$1,704,021	$1,542,921	$1,409,578
Cost of sales	**815,495**	774,702	758,923	676,777	586,289
% of sales	**45**	46	45	44	42
Selling and administrative expenses	**594,293**	584,823	575,442	541,169	485,285
% of sales	**33**	35	34	35	34
Severance and restructuring costs	**10,775**	11,411	2,551	1,126	2,524
Operating profit	**388,431**	317,730	367,105	323,849	335,480
% of sales	**21**	19	22	21	24
Net income	**271,843**	211,111	246,773	221,817	224,829
% of sales	**15**	13	14	14	16
Financial Data[(a)]					
Working capital	**$ 414,032**	$ 420,815	$ 301,815	$ 365,269	$ 242,939
Net property, plant and equipment and other non-current assets	**1,676,790**	1,648,853	1,607,447	1,451,113	1,242,892
Total capital[(b)]	**1,769,151**	1,726,341	1,662,283	1,498,082	1,261,962
Total assets	**2,422,365**	2,360,444	2,280,130	2,053,179	1,829,515
Long-term liabilities	**1,239,219**	1,409,652	1,004,465	928,519	816,061
Shareholders' equity	**851,603**	660,016	904,797	887,863	669,770
Return on average total capital — %[(c)]	**16**	13	17	18	23
Return on average shareholders' equity — %[(d)]	**37**	26	27	29	38
Per-Share Data[(a)]					
Average number of common shares	**57,060**	60,652	63,656	64,214	64,407
Average number of common shares and common share equivalents	**57,530**	61,151	64,281	64,908	65,103
Basic earnings per share	**$ 4.76**	$ 3.48	$ 3.88	$ 3.45	$ 3.49
Diluted earnings per share	**4.73**	3.45	3.84	3.42	3.45
Dividends per common share	**0.99**	0.90	0.76	0.63	0.525
Book value per common share	**14.85**	11.51	14.49	13.83	10.42

(a) See accompanying Notes to Consolidated Financial Statements.

(b) Notes payable, plus current portion of long-term debt, plus long-term debt, minus cash and marketable securities, plus shareholders' equity.

(c) Net income plus after-tax interest expense on borrowings as a percentage of the average of quarterly borrowings (net of cash) plus shareholders' equity over five accounting periods.

(d) Net income as a percentage of average quarterly shareholders' equity over five accounting periods.

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

NOTE REGARDING AMOUNTS AND FISCAL YEAR REFERENCES

In this annual report, all amounts related to United States dollars and foreign currency and to the number of Nordson Corporation's common shares, except for per share earnings and dividend amounts, are expressed in thousands. Unless the context otherwise indicates, all references to "we," "us," "our," or the "Company" mean Nordson Corporation.

Unless otherwise noted, all references to years relate to our fiscal year ending October 31.

Critical Accounting Policies and Estimates

Our consolidated financial statements and accompanying notes have been prepared in accordance with accounting principles generally accepted in the United States. The preparation of these financial statements requires management to make estimates, judgments and assumptions that affect reported amounts of assets, liabilities, revenues and expenses. On an ongoing basis, we evaluate the accounting policies and estimates that are used to prepare financial statements. We base our estimates on historical experience and assumptions believed to be reasonable under current facts and circumstances. Actual amounts and results could differ from these estimates used by management.

Certain accounting policies that require significant management estimates and are deemed critical to our results of operations or financial position are discussed below. On a regular basis, critical accounting policies are reviewed with the Audit Committee of the board of directors.

Revenue recognition — Most of our revenues are recognized upon shipment, provided that persuasive evidence of an arrangement exists, the sales price is fixed or determinable, collectibility is reasonably assured, and title and risk of loss have passed to the customer. Certain arrangements may include installation, installation supervision, training, and spare parts, which tend to be completed in a short period of time, at an insignificant cost, and utilizing skills not unique to us, and, therefore, are typically regarded as inconsequential or perfunctory. Revenue for undelivered items is deferred and included within accrued liabilities in the accompanying balance sheet. Revenues deferred in 2016, 2015 and 2014 were not material.

Translation of foreign currency financial statements and foreign currency transactions — Our reporting currency is the U.S. dollar. However, the functional currency for each of our foreign subsidiaries is its principal operating currency. We translate the amounts included in our Consolidated Statements of Income from our foreign subsidiaries into U.S. dollars at weighted-average exchange rates, which we believe are representative of the actual exchange rates on the dates of the transactions. Our foreign subsidiaries' assets and liabilities are translated into U.S. dollars from local currency at the actual exchange rates as of the end of each reporting date, and we record the resulting foreign exchange translation adjustments in our Consolidated Balance Sheets as a component of accumulated other comprehensive income (loss). If the U.S. dollar strengthens, we reflect the resulting losses as a component of accumulated other comprehensive income (loss). Conversely, if the U.S. dollar weakens, foreign exchange translation gains result, which favorably impact accumulated other comprehensive income (loss). Translation adjustments may be included in net earnings in the event of a sale or liquidation of certain of our underlying foreign investments. If we determine that the functional currency of any of our foreign subsidiaries should be the U.S. dollar, our financial statements will be affected. Should this occur, we will adjust our reporting to appropriately account for any such changes.

As appropriate, we use permanently invested intercompany loans as a source of capital to reduce exposure to foreign currency fluctuations at our foreign subsidiaries. These loans, on a consolidated basis, are treated as being analogous to equity for accounting purposes. Therefore, foreign exchange gains or losses on these intercompany loans are recorded in accumulated other comprehensive income (loss).

Goodwill — Goodwill is the excess of purchase price over the fair value of tangible and identifiable intangible net assets acquired in various business combinations. Goodwill is not amortized but is tested for impairment annually at the reporting unit level, or more often if indications of impairment exist. Our reporting units are the Adhesive Dispensing Systems segment, the Industrial Coating Systems segment and one level below the Advanced Technology Systems segment.

We test goodwill in accordance with Accounting Standards Codification (ASC) 350. The goodwill impairment test is a two-step process. In the first step, performed in the fourth quarter of each year, we estimate a reporting unit's fair value using a combination of the discounted cash flow method of the Income Approach and the guideline public company method of the Market Approach and compare the result against the reporting unit's carrying value of net assets. If the carrying value of a reporting unit exceeds its fair value, then a second step is performed to determine if goodwill is impaired. We use an independent valuation specialist to assist with refining our assumptions and methods used to determine fair values using these methods. In step one, the discounted cash flow method uses assumptions for revenue growth, operating margin, and working capital turnover that are based on general management's strategic plans tempered by performance trends and reasonable expectations about those trends. Terminal value calculations employ a published formula known as the Gordon Growth Model Method that essentially captures the present value of perpetual cash flows beyond the last projected period assuming a constant Weighted Average Cost of Capital (WACC) methodology and growth rate. For each reporting unit, a sensitivity analysis is performed to vary the discount and terminal growth rates in order to provide a range of reasonableness for detecting impairment.

Discount rates are developed using a WACC methodology. The WACC represents the blended average required rate of return for equity and debt capital based on observed market return data and company specific risk factors. For 2016, the discount rates used ranged from 9 percent to 15 percent depending upon the reporting unit's size, end market volatility, and projection risk. The calculated internal rate of return for the discounted cash flow method was 10 percent, the same as the calculated WACC for total Nordson. In the application of the guideline public company method, fair value is determined using transactional evidence for similar publicly traded equity. The comparable company guideline group is determined based on relative similarities to each reporting unit since exact correlations are not available. An indication of fair value for each reporting unit is based on the placement of each reporting unit within a range of multiples determined for its comparable guideline company group. Valuation multiples are derived by dividing latest twelve month performance for revenues and EBITDA into total invested capital, which is the sum of traded equity plus interest bearing debt less cash. These multiples are applied against the revenue and EBITDA of each reporting unit. While the implied indications of fair value using the guideline public company method yield meaningful results, the discounted cash flow method of the income approach includes management's thoughtful projections and insights as to what the reporting units will accomplish in the near future. Accordingly, the reasonable, implied fair value of each reporting unit is a blend based on the relative strength of the approaches employed.

To test the reasonableness of the aggregate fair value, we performed the control premium test, which compares the sum of the implied fair values calculated for our reporting units (net of debt) to the market value of equity. The control premium was 1 percent as of the test date of August 1, 2016 and a slight discount to the market value of equity as of October 31, 2016. The control premium indicated that the discounted cash flow valuation was reasonable.

In 2016 and 2015, the results of our step one testing indicated no impairment; therefore, the second step of impairment testing was not necessary.

The excess of fair value (FV) over carrying value (CV) was compared to the carrying value for each reporting unit. Based on the results shown in the table below and based on our measurement date of August 1, 2016, our conclusion is that no indicators of impairment exist in 2016. Potential events or circumstances, such as a sustained downturn in global economies, could have a negative effect on estimated fair values.

	WACC	Excess of FV over CV	Goodwill
Adhesive Dispensing Systems Segment	9%	402%	$387,649
Industrial Coating Systems Segment	12%	287%	$ 24,058
Advanced Technology Systems Segment — Electronics Systems	11%	235%	$ 17,495
Advanced Technology Systems Segment — Fluid Management	10%	92%	$608,955
Advanced Technology Systems Segment — Test & Inspection	15%	33%	$ 46,650

The table above does not include acquisitions that occurred after the August 1 measurement date but before our fiscal year-end. We acquired LinkTech™ Quick Couplings, Inc. ("LinkTech") on September 1, 2016. Determination of the preliminary goodwill associated with this acquisition was completed with the assistance of an independent valuation specialist in the fourth quarter of 2016. Since the date of the valuation, no events or changes in circumstances have occurred that would more likely than not reduce the fair value of the acquisition below its carrying value. For future valuation purposes, LinkTech will be included in the Advanced Technology Systems — Fluid Management reporting unit.

Other long-lived assets — We test other depreciable and amortizable long-lived assets for recoverability in accordance with ASC 360 using undiscounted cash flows if indicators of impairment exist. The total carrying value of long-lived assets for each reporting unit is compared to the forecasted cash flows of each reporting unit's long-lived assets being tested. Cash flows have been defined as earnings before interest, taxes, depreciation, and amortization, less annual maintenance capital spending.

Inventories — Inventories are valued at the lower of cost or market. Cost was determined using the last-in, first-out (LIFO) method for 20 percent of consolidated inventories at October 31, 2016 and October 31, 2015, with the first-in, first-out (FIFO) method used for the remaining inventory. On an ongoing basis, inventory is tested for technical obsolescence, as well as for future demand and changes in market conditions. We have historically maintained inventory reserves to reflect those conditions when the cost of inventory is not expected to be recovered. Reserves are also maintained for inventory used for demonstration purposes. The inventory reserve balance was $29,324, $28,230 and $26,744 at October 31, 2016, 2015 and 2014, respectively.

Pension plans and postretirement medical plans — The measurement of liabilities related to our pension plans and postretirement medical plans is based on management's assumptions related to future factors, including interest rates, return on pension plan assets, compensation increases, mortality and turnover assumptions, and health care cost trend rates.

The weighted-average discount rate used to determine the present value of our domestic pension plan obligations was 3.94 percent at October 31, 2016 and 4.39 percent at October 31, 2015. The weighted-average discount rate used to determine the present value of our various international pension plan obligations was 1.86 percent at October 31, 2016, compared to 2.81 percent at October 31, 2015. The discount rates used for all plans were determined by using quality fixed income investments with a duration period approximately equal to the period over which pension obligations are expected to be settled.

In determining the expected return on plan assets, we consider both historical performance and an estimate of future long-term rates of return on assets similar to those in our plans. We consult with and consider the opinions of financial and actuarial experts in developing appropriate return assumptions. The expected rate of return (long-term investment rate) on domestic pension assets used to determine net benefit costs was 6.72 percent in 2016 and 6.76 percent in 2015. The average expected rate of return on international pension assets used to determine net benefit costs was 4.22 percent in 2016 and 4.39 percent in 2015.

The assumed rate of compensation increases used to determine the present value of our domestic pension plan obligations was 3.61 percent at October 31, 2016, compared to 3.50 percent at October 31, 2015. The assumed rate of compensation increases used to determine the present value of our international pension plan obligations was 3.12 percent at October 31, 2016, compared to 3.22 percent at October 31, 2015.

Annual expense amounts are determined based on the discount rate used at the end of the prior year. Differences between actual and assumed investment returns on pension plan assets result in actuarial gains or losses that are amortized into expense over a period of years.

Economic assumptions have a significant effect on the amounts reported. The effect of a one percent change in the discount rate, expected return on assets and compensation increase is shown in the table below. Bracketed numbers represent decreases in expense and obligation amounts.

	United States		International	
	1% Point Increase	1% Point Decrease	1% Point Increase	1% Point Decrease
Discount rate:				
Effect on total service and interest cost components in 2016	$ (5,561)	$ 6,767	$ (887)	$ 1,048
Effect on pension obligation as of October 31, 2016	$(54,984)	$ 69,133	$(15,416)	$19,961
Expected return on assets:				
Effect on total service and interest cost components in 2016	$ (3,017)	$ 3,017	$ (361)	$ 361
Compensation increase:				
Effect on total service and interest cost components in 2016	$ 4,017	$ (2,394)	$ 708	$ (638)
Effect on pension obligation as of October 31, 2016	$ 21,485	$(13,463)	$ 3,626	$ (3,289)

With respect to the domestic postretirement medical plan, the discount rate used to value the benefit plan was 4.05 percent at October 31, 2016 and 4.50 percent at October 31, 2015. The annual rate of increase in the per capita cost of covered benefits (the health care cost trend rate) is assumed to be 3.63 percent in 2017, decreasing gradually to 3.24 percent in 2026.

For the international postretirement plan, the discount rate used to value the benefit obligation was 3.40 percent at October 31, 2016 and 4.35 percent at October 31, 2015. The annual rate of increase in the per capita cost of covered benefits (the health care cost trend rate) is assumed to be 6.13 percent in 2017, decreasing gradually to 3.50 percent in 2031.

The discount rate and the health care cost trend rate assumptions have a significant effect on the amounts reported. For example, a one-percentage point change in the discount rate and the assumed health care cost trend rate would have the following effects. Bracketed numbers represent decreases in expense and obligation amounts.

	United States		International	
	1% Point Increase	1% Point Decrease	1% Point Increase	1% Point Decrease
Discount rate:				
Effect on total service and interest cost components in 2016	$ (710)	$ 860	$ (6)	$ 6
Effect on postretirement obligation as of October 31, 2016	$(10,287)	$12,776	$ (94)	$ 123
Health care trend rate:				
Effect on total service and interest cost components in 2016	$ 628	$ (495)	$ 10	$ (8)
Effect on postretirement obligation as of October 31, 2016	$ 11,024	$ (8,836)	$146	$(113)

Employees hired after January 1, 2002, are not eligible to participate in the domestic postretirement medical plan.

In the fourth quarter of 2016, we adopted a change in the method used to estimate the service and interest cost components of net periodic benefit cost for defined benefit pension plans and postretirement benefit plans. Historically, for the vast majority of our plans, the service and interest cost components were estimated using a single weighted-average discount rate derived from the yield curve used to measure the benefit obligation at the beginning of the period. Beginning in 2017, we will use a spot rate approach by applying the specific spot rates along the yield curve to the relevant projected cash flows in the estimation of the service and interest components of benefit cost, resulting in a more precise measurement. This change does not affect the measurement of total benefit obligations. The change will be accounted for as a change in estimate that is inseparable from a change in accounting principle and, accordingly, will be accounted for prospectively starting in 2017. The reductions in service and interest costs for 2017 associated with this change are expected to be $1,100 and $3,700, respectively.

Pension and postretirement expenses in 2017 are expected to be approximately $1,211 lower than 2016, primarily due to the adoption of the spot rate approach as noted above.

Income taxes — Income taxes are estimated based on income for financial reporting purposes. Deferred income taxes reflect the net tax effect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes and certain changes in valuation allowances. We provide valuation allowances against deferred tax assets if, based on available evidence, it is more likely than not that some portion or all of the deferred tax assets will not be realized.

Management believes the valuation allowances are adequate after considering future taxable income, allowable carryforward periods and ongoing prudent and feasible tax planning strategies. In the event we were to determine that we would be able to realize the deferred tax assets in the future in excess of the net recorded amount (including the valuation allowance), an adjustment to the valuation allowance would increase income in the period such determination was made. Conversely, should we determine that we would not be able to realize all or part of the net deferred tax asset in the future, an adjustment to the valuation allowance would be expensed in the period such determination was made.

Further, at each interim reporting period, we estimate an effective income tax rate that is expected to be applicable for the full year. Significant judgment is involved regarding the application of global income tax laws and regulations and when projecting the jurisdictional mix of income. Additionally, interpretation of tax laws, court decisions or other guidance provided by taxing authorities influences our estimate of the effective income tax rates. As a result, our actual effective income tax rates and related income tax liabilities may differ materially from our estimated effective tax rates and related income tax liabilities. Any resulting differences are recorded in the period they become known.

Financial instruments — Assets, liabilities and commitments that are to be settled in cash and are denominated in foreign currencies are sensitive to changes in currency exchange rates. We enter into foreign currency forward contracts, which are derivative financial instruments, to reduce the risk of foreign currency exposures resulting from the collection of receivables, payables and loans denominated in foreign currencies. The maturities of these contracts are usually less than 90 days. Forward contracts are not designated as hedging instruments and therefore are marked to market each accounting period, and the resulting gains or losses are included in "other — net" within other income (expense) in the Consolidated Statement of Income.

Warranties — We provide customers with a product warranty that requires us to repair or replace defective products within a specified period of time (generally one year) from the date of delivery or first use. An accrual is recorded for expected warranty costs for products shipped through the end of each accounting period. In determining the amount of the accrual, we rely primarily on historical warranty claims. Amounts charged to the warranty reserve were $14,487, $12,531 and $10,813 in 2016, 2015 and 2014, respectively. The reserve balance was $11,770, $10,537 and $9,918 at October 31, 2016, 2015 and 2014, respectively.

Performance share incentive awards — Executive officers and selected other key employees are eligible to receive share awards with payouts based on corporate financial performance over three-year periods. Award payouts vary based on the degree to which corporate financial performance equals or exceeds predetermined threshold, target and maximum performance levels at the end of a performance period. No award payout will occur unless certain threshold performance levels are equaled or exceeded. The amount of compensation expense is based upon current performance projections for each three-year performance period and the percentage of the requisite service that has been rendered. The calculations are also based upon the grant date fair value determined using the closing market price of Nordson Common Stock at the grant date, reduced by the implied value of dividends not to be paid. Awards are recorded as capital in excess of stated value in shareholders' equity. The cumulative amount recorded at October 31, 2016 for the plans originating in 2014, 2015 and 2016 was $10,951. Compensation expense attributable to all performance share incentive award periods for executive officers and selected other key employees for 2016, 2015 and 2014 was $7,083, $3,459 and $4,304, respectively.

2016 compared to 2015

Sales — Worldwide sales for 2016 were $1,808,994, an increase of 7.1 percent from 2015 sales of $1,688,666. Sales volume increased 8.5 percent and unfavorable currency translation effects reduced sales by 1.4 percent. The volume increase consisted of 6.5 percent from organic growth and 2.0 percent from acquisitions. We had one acquisition during 2016, LinkTech, which is included within the Advanced Technology Systems segment. Three acquisitions were made during 2015: Liquidyn GmbH ("Liquidyn") and MatriX Technologies GmbH ("MatriX"), which were included within the Advanced Technology Systems segment, and WAFO Produktionsgesellschaft GmbH ("WAFO"), which was included in the Adhesives Dispensing Systems segment. As used throughout this Form 10-K, geographic regions include the Americas (Canada, Mexico and Central and South America), Asia Pacific (excluding Japan), Europe, Japan, and the United States.

Sales of the Adhesive Dispensing Systems segment were $879,573 in 2016, an increase of $43,507, or 5.2 percent, from 2015 sales of $836,066. The increase was the net result of a sales volume increase of 6.9 percent partially offset by unfavorable currency effects that reduced sales by 1.7 percent. The sales volume increase consisted of 0.7 percent from the WAFO acquisition and 6.2 percent from organic volume. Within this segment, sales volume increased in all geographic regions except for the Americas and Japan, and was particularly strong in Europe. Organic growth was driven by product lines serving consumer non-durable, disposable hygiene, general product assembly, rigid packaging and polymer processing end markets.

Sales of the Advanced Technology Systems segment were $676,329 in 2016, an increase of $82,471, or 13.9 percent, from 2015 sales of $593,858. The increase was the result of a sales volume increase of 14.7 percent partially offset by unfavorable currency effects that reduced sales by 0.8 percent. The sales volume increase consisted of 10.1 percent from organic volume and 4.6 percent from the first-year effect of acquisitions. Within the segment, sales volume, inclusive of acquisitions, increased in all geographic regions, and was most pronounced in Japan and Asia Pacific. Growth was driven by increased demand for test and inspection and automated dispensing solutions serving electronics end markets, as well continued strength in fluid management product lines serving medical and industrial end markets.

Sales of the Industrial Coating Systems segment were $253,092 in 2016, a decrease of $5,650, or 2.2 percent, from 2015 sales of $258,742. The decrease was the result of a sales volume decrease of 0.6 percent and unfavorable currency effects that reduced sales by 1.6 percent. Within this segment, sales volume increased in the Americas and Asia Pacific regions, and was offset by decreases in the United States, Europe and Japan. Growth in cold material product lines serving automotive end markets was offset by softness in powder coating and container product lines serving industrial end markets.

Sales outside the United States accounted for 70.6 percent of our sales in 2016, as compared to 68.6 percent in 2015. On a geographic basis, sales in the United States were $531,117, an increase of 0.2 percent from 2015. The increase in sales volume consisted of 0.4 percent from acquisitions, offset by an organic volume decline of 0.2 percent. In the Americas region, sales were $124,657, a decrease of 3.6 percent from 2015, with volume increasing 2.5 percent offset by unfavorable currency effects of 6.1 percent. The increase in sales volume consisted of 1.7 percent from organic volume and 0.8 percent from acquisitions. Sales in Europe were $503,869, an increase of 8.9 percent from 2015, with volume increasing 12.3 percent partially offset by unfavorable currency effects of 3.4 percent. The increase in sales volume consisted of 9.2 percent from organic volume and 3.1 percent from acquisitions. Sales in Japan were $122,054, an increase of 13.2 percent from 2015, with volume increasing 2.2 percent and favorable currency effects of 11.0 percent. The increase in sales volume consisted of 1.9 percent from organic volume and 0.3 percent from acquisitions. Sales in the Asia Pacific region were $527,297, an increase of 14.9 percent from the prior year, with volume increasing 17.4 percent partially offset by unfavorable currency effects of 2.5 percent. The increase in sales volume consisted of 14.0 percent from organic growth and 3.4 percent from acquisitions.

It is estimated that the effect of pricing on total revenue was not material relative to 2015.

Operating profit — Cost of sales were $815,495 in 2016, up 5.3 percent from 2015. Gross profit, expressed as a percentage of sales, increased to 54.9 percent in 2016 from 54.1 percent in 2015. Of the 0.8 percentage point improvement in gross margin, favorable product mix added 1.3 percentage points primarily related to higher sales growth in our Adhesive Dispensing Systems and Advanced Technology Systems segments, which have higher margins relative to our Industrial Coating Systems segment. The 0.5 percentage point offset is primarily due to unfavorable currency translation effects.

Selling and administrative expenses were $594,293 in 2016, compared to $584,823 in 2015. The 1.6 percent increase includes 2.9 percent primarily in support of higher sales growth, offset by 1.3 percent due to currency translation effects.

Selling and administrative expenses as a percentage of sales decreased to 32.9 percent in 2016 from 34.6 percent in 2015. The 1.7 percentage point improvement is primarily due to leveraging higher sales growth in our Adhesive Dispensing Systems and Advanced Technology Systems segments.

Severance and restructuring costs of $10,775 were recorded in 2016. Within the Adhesives Dispensing Systems segment, restructuring initiatives to optimize operations in the U.S. and Belgium and consolidate certain polymer processing product line facilities in the U.S. resulted in severance and restructuring costs of $7,800. To enhance operational efficiency and customer service within the Advanced Technology Systems segment, a restructuring initiative resulted in severance and restructuring costs of $1,054. Within the Industrial Coatings Systems segment, a restructuring program to enhance operational efficiency and customer service resulted in severance costs of $1,921. Additional costs related to these initiatives are not expected to be material in future periods. All severance and restructuring costs are included in selling and administrative expenses in the Consolidated Statements of Income.

Operating capacity for each of our segments can support fluctuations in order activity without significant changes in operating costs. Also, currency translation affects reported operating margins. Operating margins for each segment were unfavorably impacted by a stronger dollar primarily against the British Pound and Chinese Yuan during 2016 as compared to 2015.

Operating profit as a percentage of sales increased to 21.5 percent in 2016 compared to 18.8 percent in 2015. Of the 2.7 percentage point improvement in operating margin, favorable leverage of our selling and administrative expenses contributed 1.8 percentage points, favorable product mix added 1.3 percentage points primarily related to higher sales growth in our Adhesives Dispensing Systems and Advanced Technology Systems segments, which have higher margins relative to our Industrial Coating Systems segment, and lower severance and restructuring expenses contributed 0.1 percentage points. The 0.5 percentage point offset is primarily due to unfavorable currency translation effects.

For the Adhesive Dispensing Systems segment, operating profit as a percentage of sales increased to 26.1 percent in 2016 compared to 23.4 percent in 2015. Of the 2.7 percentage point improvement in operating margin, favorable leverage of our selling and administrative expenses contributed 2.0 percentage points, favorable product mix added 1.2 percentage points due to increased sales to consumer non-durable, disposable hygiene, general product assembly and rigid packaging end markets, and lower severance and restructuring expense added 0.1 percentage points. The 0.6 percentage point offset is primarily due to unfavorable currency translation effects.

For the Advanced Technology Systems segment, operating profit as a percentage of sales increased to 23.6 percent in 2016 compared to 20.4 percent in 2015. Of the 3.2 percentage point improvement in operating margin, favorable leverage of our selling and administrative expenses contributed 2.2 percentage points, favorable product mix added 0.9 percentage points, and lower severance and restructuring expenses contributed 0.3 percentage points. The 0.2 percentage point offset is primarily due to unfavorable currency translation effects.

For the Industrial Coating Systems segment, operating profit as a percentage of sales increased to 17.2 percent in 2016 compared to 16.0 percent in 2015. Of the 1.2 percentage point improvement in operating margin, favorable product mix added 2.3 percentage points, primarily related to sales of engineered systems for which margins vary depending on the type of customer application, and favorable leverage of our selling and administrative expenses contributed 0.2 percentage points. The remaining 1.3 percentage point offset was primarily due to severance and restructuring expenses and unfavorable currency translation effects.

Interest and other income (expense) — Interest expense in 2016 was $21,322, an increase of $3,218, or 17.8 percent, from 2015. The increase was due to higher average borrowing levels between periods, offset by reversals of interest accruals related to the effective settlement of a tax exam. Other income in 2016 was $657 compared to $678 in 2015. Included in the current year's other income were a litigation settlement of $800 and $2,004 of foreign currency gains. These gains were partially offset by $1,530 of charges primarily related to the reversal of an indemnification asset resulting from the effective settlement of a tax exam. Significant items in 2015 were proceeds from a favorable litigation settlement of $1,608 and loss on disposal of fixed assets of $653.

Income taxes — Income tax expense in 2016 was $96,651, or 26.2 percent of pre-tax income, as compared to $89,751, or 29.8 percent of pre-tax income in 2015.

On December 18, 2015, the Protecting Americans from Tax Hikes Act of 2015 was enacted which retroactively reinstated the Federal Research and Development Tax Credit (Federal R&D Tax Credit) as of January 1, 2015, and made it permanent. As a result, our income tax provision for 2016 includes a discrete tax benefit of $2,200 related to 2015. The tax rate for 2016 also includes a discrete tax benefit of $6,154 related to dividends paid from previously taxed foreign earnings generated prior to 2015, and a benefit of $2,682 related to the effective settlement of a tax exam.

Net income — Net income was $271,843, or $4.73 per diluted share, in 2016, compared to net income of $211,111, or $3.45 per diluted share, in 2015. This represents a 28.8 percent increase in net income and a 37.1 percent increase in diluted earnings per share. The percentage change in earnings per share is more than the percentage change in net income due to a lower number of shares outstanding in the current year as a result of share repurchases.

Recently issued accounting standards — In May 2014, the Financial Accounting Standards Board (FASB) issued a new standard regarding revenue recognition. Under this standard, a company recognizes revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. The standard implements a five-step process for customer contract revenue recognition that focuses on transfer of control. In August 2015, the FASB issued a standard to delay the effective date by one year. In accordance with this delay, the new standard is effective for us beginning in the first quarter of 2019. Early adoption is permitted, but not before the original effective date of the standard. The new standard is required to be applied retrospectively to each prior reporting period presented or retrospectively with the cumulative effect of initially applying it recognized at the date of initial application. We are performing a preliminary review of the new guidance as compared to our current accounting policies. We are currently assessing the impact this standard, along with the subsequent updates and clarifications, will have on our consolidated financial statements and disclosures. During 2017, we plan to assess our contracts and consider our method of adoption.

In April 2015, the FASB issued a new standard regarding the presentation of debt issuance costs. Under this standard, a company is required to present unamortized debt issuance costs related to a recognized debt liability in the balance sheet as a direct deduction from the carrying amount of that debt liability, rather than as a separate asset. The recognition and measurement guidance for debt issuance costs are not affected by this new standard. In August 2015, the FASB issued an amendment to this standard, which added clarification to the presentation of debt issuance costs. This amendment allows debt issuance costs related to line-of-credit arrangements to be presented as an asset and subsequently amortized ratably over the term of the line-of-credit agreement, regardless of whether there are any outstanding borrowings on the line-of-credit arrangement. It will be effective for us beginning in 2017. We do not expect this standard to have a material impact on our consolidated financial statements as it will only impact presentation.

In July 2015, the FASB issued a new standard regarding the measurement of inventory. Under this standard, inventory that is measured using the first-in, first-out ("FIFO") or average cost methods is required to be measured at the lower of cost or net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. This standard does not impact inventory measured on a last-in, last-out ("LIFO") method. It will be effective for us beginning in 2017. We do not expect this standard to have a material impact on our consolidated financial statements.

In September 2015, the FASB issued a new standard intended to simplify the accounting for measurement period adjustments in a business combination. Measurement period adjustments are changes to provisional amounts recorded when the accounting for a business combination is incomplete as of the end of a reporting period. The measurement period can extend for up to a year following the transaction date. During the measurement period, companies may make adjustments to provisional amounts when information necessary to complete the measurement is received. The new guidance requires companies to recognize these adjustments, including any related impacts to net income, in the reporting period in which the adjustments are determined. Companies are no longer required to retroactively apply measurement period adjustments to all periods presented. It will be effective for us beginning in 2017. The new guidance will be applied prospectively and the impact of adoption will be dependent on the nature of measurement period adjustments that may be necessary.

In November 2015, the FASB issued a new standard regarding the balance sheet classification of deferred taxes, which will require entities to present deferred tax assets and liabilities as noncurrent on the balance sheet. This guidance simplifies the current guidance, which requires entities to separately present deferred tax assets and liabilities as current and noncurrent on the balance sheet. We have elected to early adopt this standard prospectively as of October 31, 2016, as is permitted under the standard. Due to the prospective treatment, prior periods presented in these financial statements have not been adjusted.

In February 2016, the FASB issued a new standard which requires a lessee to recognize on the balance sheet the assets and liabilities for the rights and obligations created by those leases with a lease term of more than twelve months. Leases will continue to be classified as either financing or operating, with classification affecting the recognition, measurement and presentation of expenses and cash flows arising from a lease. It will be effective for us beginning in 2020. We are currently assessing the impact this standard will have on our consolidated financial statements.

In March 2016, the FASB issued a new standard which simplifies the accounting for share-based payment transactions. This guidance requires that excess tax benefits and tax deficiencies be recognized as income tax expense or benefit in the Consolidated Statements of Income rather than additional paid-in capital. Additionally, the excess tax benefits will be classified along with other income tax cash flows as an operating activity, rather than a financing activity, on the Statement of Cash Flows. Further, the update allows an entity to make a policy election to recognize forfeitures as they occur or estimate the number of awards expected to be forfeited. It will be effective for us beginning in 2018 and should be applied prospectively, with certain cumulative effect adjustments. Early adoption is permitted. We are currently assessing the impact this standard will have on our consolidated financial statements.

2015 compared to 2014

Sales — Worldwide sales for 2015 were $1,688,666, a decrease of 0.9 percent from 2014 sales of $1,704,021. Sales volume increased 5.8 percent, and unfavorable currency translation effects caused by the stronger U.S. dollar reduced sales by 6.7 percent. The volume increase consisted of 3.4 percent from organic growth and 2.4 percent from acquisitions. Three acquisitions were made during 2015: Liquidyn and MatriX, which are included within the Advanced Technology Systems segment, and WAFO, which is included in the Adhesives Dispensing Systems segment. Two acquisitions were made during 2014: Avalon Laboratories and Dima Group B.V., both of which were included within the Advanced Technology Systems segment. As used throughout this Form 10-K, geographic regions include the Americas (Canada, Mexico and Central and South America), Asia Pacific (excluding Japan), Europe, Japan, and the United States.

Sales of the Adhesive Dispensing Systems segment were $836,066 in 2015, a decrease of $63,630, or 7.1 percent, from 2014 sales of $899,696. The decrease was the net result of a sales volume increase of 2.3 percent offset by unfavorable currency effects that reduced sales by 9.4 percent. The sales volume increase consisted of 0.3 percent from acquisitions and 2.0 percent from organic volume. Within this segment, sales volume, inclusive of acquisitions, increased in all geographic regions except for the United States, and was particularly strong in the Americas. Organic growth in product lines serving disposable hygiene, general product assembly, rigid packaging and injection molding end markets was offset by softness in product lines serving extrusion, polymer compounding and pelletizing end markets.

Sales of the Advanced Technology Systems segment were $593,858 in 2015, an increase of $32,074, or 5.7 percent, from 2014 sales of $561,784. The increase was the result of a sales volume increase of 8.6 percent offset by unfavorable currency effects that reduced sales by 2.9 percent. The sales volume increase consisted of 1.7 percent from organic volume and 6.9 percent from the first-year effect of acquisitions. Within the segment, sales volume, inclusive of acquisitions, increased in all geographic regions, except for Japan, and was most pronounced in the United States, Europe and the Americas. Growth in surface treatment, test and inspection and plasma solutions in electronics end markets, as well as growth in fluid management applications serving medical end markets, was offset by lower demand for automated dispensing systems.

Sales of the Industrial Coating Systems segment were $258,742 in 2015, an increase of $16,201, or 6.7 percent, from 2014 sales of $242,541. The increase was the result of a sales volume increase of 12.5 percent offset by unfavorable currency effects that reduced sales by 5.8 percent. The sales volume increase was entirely due to organic growth. Within this segment, sales volume increased in all geographic regions, and was most pronounced in the Americas and Europe. Sales growth was driven by demand in our consumer durable, automotive, cold materials, industrial and container end markets.

Sales outside the United States accounted for 68.6 percent of our sales in 2015, as compared to 70.4 percent in 2014. On a geographic basis, sales in the United States were $529,893, an increase of 5.2 percent from 2014. The increase consisted of 0.6 percent organic volume and 4.6 percent from acquisitions. In the Americas region, sales were $129,325, an increase of 6.9 percent from 2014, with volume increasing 18.8 percent offset by unfavorable currency effects of 11.9 percent. The increase in sales volume consisted of 18.6 percent from organic volume and 0.2 percent from acquisitions. Sales in Europe were $462,565, down 6.5 percent from 2014, with volume increasing 8.1 percent offset by unfavorable currency effects of 14.6 percent. The increase in sales volume consisted of 5.5 percent from organic growth and 2.6 percent from acquisitions. Sales in Japan were $107,797, down 15.2 percent from the prior year. The decrease was due to lower volume of 1.3 percent and unfavorable currency effects of 13.9 percent. The decrease in sales volume consisted of an organic volume decline of 1.4 percent offset by a 0.1 percent increase from acquisitions. Sales in the Asia Pacific region were $459,086, an increase of 0.3 percent from the prior year, with volume increasing 2.6 percent, offset by unfavorable currency effects of 2.3 percent. The increase in sales volume consisted of 1.4 percent from organic growth and 1.2 percent from acquisitions.

It is estimated that the effect of pricing on total revenue was not material relative to 2014.

Operating profit — Cost of sales were $774,702 in 2015, up 2.1 percent from 2014. Gross profit, expressed as a percentage of sales, decreased to 54.1 percent in 2015 from 55.5 percent in 2014. The reduction in gross margin was primarily a result of unfavorable currency translation effects.

Selling and administrative expenses, were $584,823 in 2015, an increase of $9,381, or 1.6 percent, from 2014. Of the 1.6 percent increase, 7.5 percent was due to the addition of acquired businesses in the second half of 2014 and 2015 and higher compensation expenses related to increased employment levels. The 5.9 percent offset was due to unfavorable currency translation effects.

Selling and administrative expenses as a percentage of sales increased to 34.6 percent in 2015 from 33.8 percent in 2014. Of the 0.8 percent increase, 0.4 percent was due to acquisitions and higher compensation expenses related to increased employment levels and 0.4 percent was due to unfavorable currency translation effects.

Severance and restructuring costs of $11,411 were recorded in 2015. Within the Adhesives Dispensing Systems segment, restructuring initiatives to optimize operations in the U.S. and Belgium resulted in severance and restructuring costs of $7,972. Within the Advanced Technology Systems segment, certain restructuring programs to enhance operational efficiency and customer service in the U.S. and Germany resulted in severance and restructuring costs of $3,060. Within the Industrial Coatings Systems segment, a restructuring program to enhance operational efficiency and customer service resulted in severance costs of $379.

Operating capacity for each of our segments can support fluctuations in order activity without significant changes in operating costs. Also, currency translation affects reported operating margins. Operating margins for each segment were unfavorably impacted by a much stronger dollar during 2015 as compared to 2014.

Operating profit as a percentage of sales decreased to 18.8 percent in 2015 compared to 21.5 percent in 2014. Of the 2.7 percentage point decrease in operating margin, 1.9 percentage points were due to unfavorable currency translation effects, 0.5 percentage points were due to higher severance and restructuring costs and 0.3 percentage points were due to higher selling and administrative expenses.

For the Adhesive Dispensing Systems segment, operating profit as a percentage of sales decreased to 23.4 percent in 2015 compared to 25.5 percent in 2014. Of the 2.1 percentage point decline in operating margin, 2.3 percentage points were attributed to unfavorable currency translation effects, 1.5 percentage points were attributed to higher selling and administrative expenses, and 0.7 percentage points were attributed to higher severance and restructuring costs. The 2.4 percentage point offset was due to 2.2 percentage points attributed to favorable product mix and 0.2 percentage points due to lower inventory purchase price adjustments.

For the Advanced Technology Systems segment, operating profit as a percentage of sales decreased to 20.4 percent in 2015 compared to 25.0 percent in 2014. Of the 4.6 percentage point decline in operating margin, 2.2 percentage points were attributed to higher selling and administrative expenses, 1.3 percentage points were attributed to product line and customer mix, 0.7 percentage points were attributed to unfavorable currency translation effects, and 0.4 percentage points were attributed to higher severance and restructuring costs.

For the Industrial Coating Systems segment, operating profit as a percentage of sales increased to 16.0 percent in 2015 from 15.7 percent in 2014. Of the 0.3 percentage point improvement in operating margin, favorable leverage of our selling and administrative expenses contributed 2.0 percentage points and favorable product mix added 0.2 percentage points. The remaining 1.9 percentage point offset was primarily due to unfavorable currency translation effects.

Interest and other income (expense) — Interest expense in 2015 was $18,104, an increase of $3,069, or 20.4 percent, from 2014. The increase was due to higher borrowing levels used primarily to fund acquisitions in the second half of 2014 and in 2015, and to fund the purchase of treasury shares in 2015.

Other income in 2015 was $678 compared to other expense of $138 in 2014. Significant items included in 2015 were proceeds from a favorable litigation settlement of $1,608 and loss on disposal of fixed assets of $653. Significant items included in 2014 were a gain on property insurance settlement of $1,005 and foreign currency losses of $478.

Income taxes — Income tax expense in 2015 was $89,751, or 29.8 percent of pre-tax income, as compared to $105,740, or 30.0 percent of pre-tax income in 2014.

On December 19, 2014, the Tax Increase Prevention Act of 2014 was enacted which retroactively reinstated the Federal Research and Development Tax Credit (Federal R&D Tax Credit) from January 1, 2014 to December 31, 2014 and extended certain other tax provisions. As a result, our income tax provision for 2015 included discrete tax benefits of $2,486 primarily related to 2014.

Net income — Net income was $211,111, or $3.45 per diluted share, in 2015, compared to net income of $246,773, or $3.84 per diluted share, in 2014. This represents a 14.5 percent decrease in net income and a 10.2 percent decrease in diluted earnings per share.

Liquidity and Capital Resources

Cash and cash equivalents increased $16,971 in 2016. Cash provided by operating activities was $331,158 in 2016, compared to $261,951 in 2015. The primary sources were net income adjusted for non-cash income and expenses (consisting of depreciation and amortization, non-cash stock compensation, deferred income taxes, other non-cash expense and loss on sale of property, plant and equipment) and the tax benefit from the exercise of stock options, the sum of which was $358,984 in 2016, compared to $291,452 in 2015. The increase in cash provided by operating activities was primarily due to higher net income. Operating assets and liabilities used $27,826 of cash in 2016, compared to $29,501 in 2015.

Cash used by investing activities was $102,201 in 2016, down from $138,535 in 2015. In the current year, cash of $42,650 was used for the LinkTech acquisition, compared to the 2015 acquisitions of Liquidyn, WAFO and MatriX which used $75,565 of cash.

Cash of $210,280 was used by financing activities in 2016, compared to $110,978 in 2015. Included in 2016 were net short and long-term repayments of $130,217, compared to net borrowings of $325,486 in the prior year. The change was primarily due to increased repayments on our revolving credit facility in 2016. Issuance of common shares related to employee benefit plans generated $11,476 of cash in 2016, up from $5,372 in 2015. This increase was the result of higher stock option exercises. In 2016 cash of $33,421 was used for the purchase of treasury shares, down from $383,851 in 2015. Dividend payments were $56,436 in 2016, up from $54,849 in 2015 due to an increase in the annual dividend to $0.99 per share from $0.90 per share.

The following is a summary of significant changes by balance sheet caption from October 31, 2015 to October 31, 2016. Receivables increased $39,010 primarily due to higher year-end shipments. Net property, plant and equipment increased $23,189 primarily due to capital expenditures and the LinkTech acquisition, partially offset by depreciation expense. Goodwill increased $24,762 due to the LinkTech acquisition completed in 2016 that added $25,169 of goodwill, offset by $407 from the effects of currency translation. The decrease in net other intangibles of $17,124 was due to $14,610 of intangibles added as a result of the LinkTech acquisition, offset by $29,061 of amortization expense and $2,673 from the effects of currency translation.

The decrease in income taxes payable of $5,880 was due to the timing of required tax payments. The increase of $21,867 in accrued liabilities was primarily due to higher compensation-related accruals. Current maturities of long-term debt increased $15,251 primarily as a result of the $37,956 reclassification from long-term debt to current maturities for the scheduled repayments of our senior notes and New York Life credit facility, partially offset by $11,287 repayments under our €100,000 agreement with The Bank of Tokyo-Mitsubishi UFJ, Ltd. and $10,556 repayments under our New York Life credit facility. The long-term debt decrease of $148,090 primarily reflects $212,345 of net repayments under our revolving credit agreement, the $37,956 reclassification from long-term debt to current maturities as noted above, partially offset by $100,000 in borrowings under our New York Life credit facility. The $12,305 increase in long-term pension obligations and the $3,707 increase in postretirement obligations were primarily the result of lower global weighted-average discount rates.

In December 2014, the board of directors authorized a new $300,000 common share repurchase program. This program replaced the $200,000 program approved by the board in August 2013. In August 2015, the board of directors authorized the repurchase of up to an additional $200,000 of the Company's common shares. This new authorization added capacity to the board's December 2014 authorization to repurchase $300,000 of shares. Approximately $118,971 remained available for share repurchases at October 31, 2016. Uses for repurchased shares include the funding of benefit programs including stock options, restricted stock and 401(k) matching. Shares purchased are treated as treasury shares until used for such purposes. The repurchase program is being funded using cash from operations and proceeds from borrowings under our credit facilities.

As of October 31, 2016, approximately 93 percent of our consolidated cash and cash equivalents were held at various foreign subsidiaries. Deferred income taxes are not provided on undistributed earnings of international subsidiaries that are intended to be permanently invested in those operations. These undistributed earnings represent the post-income tax earnings under U.S. GAAP not adjusted for previously taxed income which aggregated approximately $757,501 and $712,913 at October 31, 2016 and 2015, respectively. Should these earnings be distributed, applicable foreign tax credits, distributions of previously taxed income, and utilization of other attributes would substantially offset taxes due upon the distribution. It is not practical to estimate the amount of additional taxes that might be payable on such undistributed earnings.

Contractual Obligations

The following table summarizes contractual obligations as of October 31, 2016:

	Payments Due by Period				
	Total	**Less than 1 Year**	**1-3 Years**	**4-5 Years**	**After 5 Years**
Long-term debt(1)	$ 982,646	$ 38,093	$234,710	$451,605	$258,238
Interest payments on long-term debt(1)	54,243	11,019	17,768	12,834	12,622
Capital lease obligations(2)	19,230	5,966	6,335	1,546	5,383
Operating leases(2)	53,565	13,725	17,838	10,707	11,295
Notes payable(3)	2,141	2,141	—	—	—
Contributions related to pension and postretirement benefits(4)	20,100	20,100	—	—	—
Purchase obligations(5)	80,563	80,336	227	—	—
Total obligations	$1,212,488	$171,380	$276,878	$476,692	$287,538

(1) In February 2015, we increased, amended and extended our existing syndicated revolving credit agreement that was scheduled to expire in December 2016. We entered into a $600,000 unsecured, multicurrency credit facility with a group of banks. This facility has a five-year term and includes a $50,000 subfacility for swing-line loans and may be increased from $600,000 to $850,000 under certain conditions. It expires in February 2020. At October 31, 2016, $244,680 was outstanding under this facility, compared to $457,025 outstanding at October 31, 2015. Balances outstanding under the prior credit agreement were transferred to the new credit agreement. The weighted average interest rate for borrowings under this agreement was 1.53 percent at October 31, 2016. There are two primary financial covenants that must be met under this facility. The first covenant limits the amount of total net indebtedness that can be incurred to 3.50 times consolidated trailing four-quarter EBITDA (both indebtedness and EBITDA as defined in the credit agreement). The second covenant requires consolidated trailing four-quarter EBITDA to be at least 3.0 times consolidated trailing four-quarter interest expense (both as defined in the credit agreement). At October 31, 2016, we were in compliance with all debt covenants, and the amount we could borrow under the credit facility would not have been limited by any debt covenants.

In 2011, we entered into a $150,000 three-year Note Purchase and Private Shelf Note agreement with New York Life Investment Management LLC. In 2013, the amount of the facility was increased from $150,000 to $175,000. In 2015, the amount of the facility was increased to $180,000. In 2016, the amount of the facility was increased to $200,000. Notes issued under the agreement may have a maturity of up to 12 years, with an average life of up to 10 years, and are unsecured. The interest rate on each note can be fixed or floating and is based upon the market rate at the borrowing date. This agreement contains customary events of default and covenants related to limitations on indebtedness and the maintenance of certain financial ratios. At October 31, 2016, there was $157,222 outstanding under this facility, compared to $67,778 at October 31, 2015. The interest rates for notes within this agreement were 2.21 percent and 2.56 percent at October 31, 2016. We were in compliance with all covenants at October 31, 2016, and the amount we could borrow would not have been limited by any debt covenants.

In 2012, we entered into a Note Purchase Agreement with a group of insurance companies under which we sold $200,000 of Senior Notes. The notes mature between July 2017 and July 2025 and bear interest at fixed rates between 2.27 percent and 3.13 percent. We were in compliance with all covenants at October 31, 2016.

In 2013, we entered into a €100,000 agreement with The Bank of Tokyo-Mitsubishi UFJ, Ltd. The term of the agreement was three years and could be extended by one year at the end of the third and fourth anniversaries. The interest rate was variable based upon the EUR LIBOR rate. We paid down the remaining $11,501 balance of the loan in 2016.

In April 2015, we entered into a $200,000 term loan facility with a group of banks. The interest rate is variable based on the LIBOR rate plus applicable margin based on our leverage ratio. As of October 31, 2016, $100,000 is due in three years and has an interest rate spread of 1.00 percent over LIBOR and $100,000 is due in five years and has an interest rate spread of 1.10 percent over LIBOR. This loan was used to pay down $100,000 of our 364-day unsecured credit facility with PNC Bank and $100,000 of our revolving credit facility in 2015. We were in compliance with all covenants at October 31, 2016.

In July 2015, we entered into a Note Purchase Agreement under which $100,000 of Senior Unsecured Notes were purchased primarily by a group of insurance companies. The notes mature in July 2025 and July 2027 and bear interest at fixed rates of 2.89 percent and 3.19 percent. We were in compliance with all covenants at October 31, 2016.

In October 2015, we entered into a €70,000 agreement with Bank of America Merrill Lynch International Limited. The term of the agreement is three years and can be extended by one year on two annual occasions if notice is given between 180 days and 30 days before the maturity date. The interest rate is variable based on the LIBOR rate plus applicable margin based on our leverage ratio. The loan was amended in 2016 to extend the term by one year and increase the principal amount. At October 31, 2016, the balance outstanding was €72,300 ($79,389) and the interest rate was 0.875 percent over LIBOR. We were in compliance with all covenants at October 31, 2016.

See Note 10 for additional information.

(2) See Note 11 for additional information.

(3) See Note 9 for additional information.

(4) Pension and postretirement plan funding amounts after 2016 will be determined based on the future funded status of the plans and therefore cannot be estimated at this time. See Note 7 for additional information.

(5) Purchase obligations primarily represent commitments for materials used in our manufacturing processes that are not recorded in our Consolidated Balance Sheet.

We believe that the combination of present capital resources, cash from operations and unused financing sources are more than adequate to meet cash requirements for 2017. There are no significant restrictions limiting the transfer of funds from international subsidiaries to the parent company.

Outlook

Our operating performance, balance sheet position, and financial ratios for 2016 remained strong relative to recent years, although uncertainties persisted in global financial markets and the general economic environment. Going forward, we are well-positioned to manage our liquidity needs that arise from working capital requirements, capital expenditures, contributions related to pension and postretirement obligations, and principal and interest payments on indebtedness. Primary sources of capital to meet these needs as well as other opportunistic investments are cash provided by operations and borrowings under our loan agreements. In 2016, cash from operations was 18.3 percent of revenue. With respect to borrowing under existing loan agreements, as of October 31, 2016, we had $355,320 available capacity under our five-year term, $600,000 unsecured, multicurrency credit facility which may be increased to $850,000 under certain conditions. This credit facility expires in February 2020. In addition, we had $42,778 borrowing capacity remaining on our $200,000 three-year Private Shelf agreement with New York Life Investment Management LLC. While these facilities provide the contractual terms for any borrowing, we cannot be assured that these facilities would be available in the event that these financial institutions failed to remain sufficiently capitalized.

Other loan agreements exist with no remaining borrowing capacity, but factor into debt covenant calculations that affect future borrowing capacity. In July 2012, we entered into a note purchase agreement with a group of insurance companies under which we sold $200,000 of senior notes. The notes mature between July 2017 and July 2025 and bear interest at fixed rates between 2.27 percent and 3.13 percent. As of April 2015, we entered into a $200,000 term loan facility with PNC Bank. $100,000 is due in three years and has an interest rate spread of 1 percent over LIBOR, and $100,000 is due in five years and has an interest rate spread of 1.1 percent over

LIBOR. In July 2015, we entered into a Note Purchase Agreement under which $100,000 of senior unsecured notes were purchased primarily by a group of insurance companies. The notes consist of two tranches, Series A and B at $50,000 each, maturing in July 2025 and July 2027, and bearing interest at fixed rates of 2.89 percent and 3.19 percent, respectively. In October 2015, we entered into a €70,000 three year term loan agreement with Bank of America Merrill Lynch International in London. This agreement was amended in September 2016 to extend the term by one year and increase the principal balance. The balance of this loan at October 31, 2016 was €72,300. The interest rate is variable based on the LIBOR rate plus applicable margin based on our leverage ratio, and was 0.875 percent over LIBOR at October 31, 2016.

Respective to all of these loans are two primary covenants, the leverage ratio that restricts indebtedness (net of cash) to a maximum 3.50 times consolidated four-quarter trailing EBITDA and the interest coverage ratio that requires four-quarter trailing EBITDA to be at minimum 3.0 times consolidated trailing four-quarter interest expense. (Debt, EBITDA, and interest expense are as defined in respective credit agreements.) With respect to these two primary covenants as of October 31, 2016, we were approximately 54 percent of the most restrictive leverage ratio and approximately 13 percent of the most restrictive interest coverage ratio. Unused borrowing capacity under existing loan agreements would amount to an additional 23 percent of the most restrictive leverage ratio.

Regarding expectations for 2017, we are optimistic about longer term growth opportunities in the diverse consumer durable, non-durable, medical, electronics and industrial end markets we serve. However, we move forward in the near-term with caution given continued slow growth in emerging markets, expectations for global GDP indicating a low-growth macroeconomic environment, and marketplace effects of political instability in certain areas of the world. With respect to the United Kingdom's (UK) expected exit (Brexit) from the European Union (EU), resulting effects upon markets we serve and tax jurisdictions in which we operate will depend upon terms of agreements the UK makes to retain access to EU markets during the near-term and more permanently and also to national laws and regulations that may replace and diverge from EU laws and regulations. Until more specific details are determined, the economic and political uncertainty in the UK and EU likely will continue along with implications upon the global economy. While the announcement of Brexit initially resulted in significant volatility in global stock markets and currency exchange markets, the interim effects at this time upon the way we do business and results from operations have not been material.

Though the pace of improvement in the global economy remains unclear, our growth potential has been demonstrated over time from our capacity to build and enhance our core businesses by entering emerging markets and pursuing market adjacencies. We drive value for our customers through our application expertise, differentiated technology, and direct sales and service support. Our priorities also are focused on operational efficiencies by employing continuous improvement methodologies in our business processes. We expect our efforts will continue to provide more than sufficient cash from operations for meeting our liquidity needs and paying dividends to common shareholders, as well as enabling us to invest in the development of new applications and markets for our technologies. Cash from operations have been 16 to 19 percent of revenues over the past five years, resulting in more than sufficient cash for our ordinary business requirements. We believe our cash provided from operations and available borrowing capacity will enable us to make other opportunistic investments in our own common shares and strategic business combinations.

With respect to contractual spending, the table above presents our financial obligations as $1,212,488 of which $171,380 is payable in 2017. In August 2015, the board of directors approved a $200,000 common share repurchase program that added capacity to the board's December 2014 approval authorizing management at its discretion to repurchase shares up to $300,000. Approximately $118,971 remained available for share repurchases as of October 31, 2016. The repurchase program is funded using cash from operations and proceeds from borrowings under our credit facilities. Timing and actual number of shares subject to repurchase are contingent on a number of factors including levels of cash generation from operations, cash requirements for acquisitions, repayment of debt and our share price. Capital expenditures for 2017 will be focused on continued investments in our information systems and projects that improve both capacity and efficiency of manufacturing and distribution operations.

Effects of Foreign Currency
The impact of changes in foreign currency exchange rates on sales and operating results cannot be precisely measured due to fluctuating selling prices, sales volume, product mix and cost structures in each country where we operate. As a general rule, a weakening of the United States dollar relative to foreign currencies has a favorable effect on sales and net income, while a strengthening of the dollar has a detrimental effect.

In 2016, as compared with 2015, the United States dollar was generally stronger against foreign currencies. If 2015 exchange rates had been in effect during 2016, sales would have been approximately $23,249 higher and third-party costs would have been approximately $8,332 higher. In 2015, as compared with 2014, the United States dollar was stronger against foreign currencies. If 2014 exchange rates had been in effect during 2015, sales would have been approximately $114,844 higher and third-party costs would have been approximately $67,414 higher. These effects on reported sales do not include the impact of local price adjustments made in response to changes in currency exchange rates.

Inflation
Inflation affects profit margins as the ability to pass cost increases on to customers is restricted by the need for competitive pricing. Although inflation has been modest in recent years and has had no material effect on the years covered by these financial statements, we continue to seek ways to minimize the impact of inflation through focused efforts to increase productivity.

Trends
The Five-Year Summary in Item 6 documents our historical financial trends. Over this period, the world's economic conditions fluctuated significantly. Our solid performance is attributed to our participation in diverse geographic and industrial markets and our long-term commitment to develop and provide quality products and worldwide service to meet our customers' changing needs.

Safe Harbor Statements Under the Private Securities Litigation Reform Act of 1995
This Form 10-K, particularly "Management's Discussion and Analysis," contains forward-looking statements within the meaning of the Securities Act of 1933, as amended, the Securities Exchange Act of 1934, as amended, and the Private Securities Litigation Reform Act of 1995. Such statements relate to, among other things, income, earnings, cash flows, changes in operations, operating improvements, businesses in which we operate and the United States and global economies. Statements in this 10-K that are not historical are hereby identified as "forward-looking statements" and may be indicated by words or phrases such as "anticipates," "supports," "plans," "projects," "expects," "believes," "should," "would," "could," "hope," "forecast," "management is of the opinion," use of the future tense and similar words or phrases.

In light of these risks and uncertainties, actual events and results may vary significantly from those included in or contemplated or implied by such statements. Readers are cautioned not to place undue reliance on such forward-looking statements. These forward-looking statements speak only as of the date made. We undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law. Factors that could cause our actual results to differ materially from the expected results are discussed in Item 1A, Risk Factors.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk

We operate internationally and enter into intercompany transactions denominated in foreign currencies. Consequently, we are subject to market risk arising from exchange rate movements between the dates foreign currencies are recorded and the dates they are settled. We regularly use foreign exchange contracts to reduce our risks related to most of these transactions. These contracts, primarily associated with the euro, yen and pound sterling, typically have maturities of 90 days or less, and generally require the exchange of foreign currencies for United States dollars at rates stated in the contracts. Gains and losses from changes in the market value of these contracts offset foreign exchange losses and gains, respectively, on the underlying transactions. Other transactions denominated in foreign currencies are designated as hedges of our net investments in foreign subsidiaries or are intercompany transactions of a long-term investment nature. As a result of the use of foreign exchange contracts on a routine basis to reduce the risks related to most of our transactions denominated in foreign currencies, as of October 31, 2016, we did not have material foreign currency exposure.

Note 13 to the financial statements contains additional information about our foreign currency transactions and the methods and assumptions used to record these transactions.

A portion of our operations is financed with short-term and long-term borrowings and is subject to market risk arising from changes in interest rates.

The tables that follow present principal repayments and weighted-average interest rates on outstanding borrowings of fixed-rate debt.

At October 31, 2016

	2017	2018	2019	2020	2021	Thereafter	Total Value	Fair Value
Annual repayments of long-term debt	**$38,093**	**$26,586**	**$28,734**	**$68,738**	**$38,187**	**$158,239**	**$358,577**	**$367,990**
Average interest rate on total borrowings outstanding during the year	**2.9%**	**2.9%**	**3.0%**	**3.0%**	**3.1%**	**3.1%**	**2.9%**	

At October 31, 2015

	2016	2017	2018	2019	2020	Thereafter	Total Value	Fair Value
Annual repayments of long-term debt	$11,340	$38,093	$26,587	$28,734	$68,738	$196,425	$369,917	$365,572
Average interest rate on total borrowings outstanding during the year	2.9%	2.7%	2.7%	2.8%	2.8%	3.0%	2.7%	

We also have variable-rate notes payable and long-term debt. The weighted average interest rate of this debt was 1.6 percent at October 31, 2016 and 1.2 percent at October 31, 2015. A one percent increase in interest rates would have resulted in additional interest expense of approximately $7,205 on the variable rate notes payable and long-term debt in 2016.

Item 8. Financial Statements and Supplementary Data

Consolidated Statements of Income

Years ended October 31, 2016, 2015 and 2014	2016	2015	2014
(In thousands except for per-share amounts)			
Sales	**$1,808,994**	$1,688,666	$1,704,021
Operating costs and expenses:			
Cost of sales	**815,495**	774,702	758,923
Selling and administrative expenses	**594,293**	584,823	575,442
Severance and restructuring costs	**10,775**	11,411	2,551
	1,420,563	1,370,936	1,336,916
Operating profit	**388,431**	317,730	367,105
Other income (expense):			
Interest expense	**(21,322)**	(18,104)	(15,035)
Interest and investment income	**728**	558	581
Other — net	**657**	678	(138)
	(19,937)	(16,868)	(14,592)
Income before income taxes	**368,494**	300,862	352,513
Income tax provision:			
Current	**100,248**	87,651	102,251
Deferred	**(3,597)**	2,100	3,489
	96,651	89,751	105,740
Net income	**$ 271,843**	$ 211,111	$ 246,773
Average common shares	**57,060**	60,652	63,656
Incremental common shares attributable to outstanding stock options, restricted stock and deferred stock-based compensation	**470**	499	625
Average common shares and common share equivalents	**57,530**	61,151	64,281
Basic earnings per share	**$ 4.76**	$ 3.48	$ 3.88
Diluted earnings per share	**$ 4.73**	$ 3.45	$ 3.84
Dividends declared per common share	**$ 0.99**	$ 0.90	$ 0.76

The accompanying notes are an integral part of the consolidated financial statements.

Consolidated Statements of Comprehensive Income

Years ended October 31, 2016, 2015 and 2014	2016	2015	2014
(In thousands)			
Net income	**$271,843**	$211,111	$246,773
Components of other comprehensive income (loss), net of tax:			
Translation adjustments	**(8,693)**	(45,154)	(23,972)
Pension and postretirement benefit plans:			
Prior service credit arising during the year	**1,831**	—	175
Net actuarial loss arising during the year	**(22,482)**	(7,588)	(29,158)
Amortization of prior service cost	**92**	(303)	(251)
Amortization of actuarial loss	**6,724**	10,146	6,989
Settlement loss recognized	**111**	1,369	398
Curtailment (gain) loss recognized	**(1,144)**	43	—
Total pension and postretirement benefit plans	**(14,868)**	3,667	(21,847)
Total other comprehensive income (loss)	**(23,561)**	(41,487)	(45,819)
Total comprehensive income	**$248,282**	$169,624	$200,954

The accompanying notes are an integral part of the consolidated financial statements.

Consolidated Balance Sheets

October 31, 2016 and 2015 *(In thousands)*	2016	2015
Assets		
Current assets:		
Cash and cash equivalents	**$ 67,239**	$ 50,268
Receivables — net	**428,560**	389,550
Inventories — net	**220,361**	225,672
Deferred income taxes	**—**	24,865
Prepaid expenses	**29,415**	21,236
Total current assets	**745,575**	711,591
Property, plant and equipment — net	**273,129**	249,940
Goodwill	**1,107,137**	1,082,375
Intangible assets — net	**260,302**	277,426
Deferred income taxes	**10,681**	5,705
Other assets	**25,541**	33,407
	$ 2,422,365	$ 2,360,444
Liabilities and shareholders' equity		
Current liabilities:		
Notes payable	**$ 2,141**	$ 1,108
Accounts payable	**75,130**	68,229
Income taxes payable	**22,762**	28,642
Accrued liabilities	**162,798**	140,931
Customer advance payments	**26,175**	22,884
Current maturities of long-term debt	**38,093**	22,842
Deferred income taxes	**—**	1,256
Current obligations under capital leases	**4,444**	4,884
Total current liabilities	**331,543**	290,776
Long-term debt	**944,553**	1,092,643
Obligations under capital leases	**9,714**	9,698
Pension obligations	**130,376**	118,071
Postretirement obligations	**70,397**	66,690
Deferred income taxes	**61,836**	89,770
Other liabilities	**22,343**	32,780
Shareholders' equity:		
Preferred shares, no par value; 10,000 shares authorized; none issued	**—**	—
Common shares, no par value; 160,000 shares authorized; 98,023 shares issued at October 31, 2016 and 2015	**12,253**	12,253
Capital in excess of stated value	**376,625**	348,986
Retained earnings	**1,932,635**	1,717,228
Accumulated other comprehensive loss	**(168,247)**	(144,686)
Common shares in treasury, at cost	**(1,301,663)**	(1,273,765)
Total shareholders' equity	**851,603**	660,016
	$ 2,422,365	$ 2,360,444

The accompanying notes are an integral part of the consolidated financial statements.

Consolidated Statements of Shareholders' Equity

Years ended October 31, 2016, 2015 and 2014

(In thousands)

	2016	2015	2014
Number of common shares in treasury			
Balance at beginning of year	**40,665**	35,588	33,805
Shares issued under company stock and employee benefit plans	**(421)**	(318)	(480)
Purchase of treasury shares	**472**	5,395	2,263
Balance at end of year	**40,716**	40,665	35,588
Common shares			
Balance at beginning and ending of year	**$ 12,253**	$ 12,253	$ 12,253
Capital in excess of stated value			
Balance at beginning of year	**$ 348,986**	$ 328,605	$ 304,549
Shares issued under company stock and employee benefit plans	**5,952**	1,458	264
Tax benefit from stock option and restricted stock transactions	**3,476**	3,661	6,385
Stock-based compensation	**18,211**	15,262	17,407
Balance at end of year	**$ 376,625**	$ 348,986	$ 328,605
Retained earnings			
Balance at beginning of year	**$ 1,717,228**	$ 1,560,966	$1,362,584
Net income	**271,843**	211,111	246,773
Dividends paid ($.99 per share in 2016, $.90 per share in 2015, and $.76 per share in 2014)	**(56,436)**	(54,849)	(48,391)
Balance at end of year	**$ 1,932,635**	$ 1,717,228	$1,560,966
Accumulated other comprehensive income (loss)			
Balance at beginning of year	**$ (144,686)**	$ (103,199)	$ (57,380)
Translation adjustments	**(8,693)**	(45,154)	(23,972)
Settlement and curtailment loss (gain) recognized, net of tax of $332 in 2016, $(491) in 2015 and $(234) in 2014	**(1,033)**	1,412	398
Defined benefit and OPEB activity — prior service cost, net of tax of $(558) in 2016, $191 in 2015 and $125 in 2014	**1,923**	(303)	(76)
Defined benefit and OPEB activity — actuarial gain (loss), net of tax of $8,642 in 2016, $(1,242) in 2015 and $11,457 in 2014	**(15,758)**	2,558	(22,169)
Balance at end of year	**$ (168,247)**	$ (144,686)	$ (103,199)
Common shares in treasury, at cost			
Balance at beginning of year	**$(1,273,765)**	$ (893,828)	$ (734,143)
Shares issued under company stock and employee benefit plans	**5,735**	4,359	6,749
Purchase of treasury shares	**(33,633)**	(384,296)	(166,434)
Balance at end of year	**$(1,301,663)**	$(1,273,765)	$ (893,828)
Total shareholders' equity	**$ 851,603**	$ 660,016	$ 904,797

The accompanying notes are an integral part of the consolidated financial statements.

Consolidated Statements of Cash Flows

Years ended October 31, 2016, 2015 and 2014	2016	2015	2014
(In thousands)			
Cash flows from operating activities:			
Net income	**$ 271,843**	$ 211,111	$ 246,773
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation	**41,243**	37,707	34,446
Amortization	**29,061**	27,487	25,308
Provision for losses on receivables	**1,867**	1,014	867
Deferred income taxes	**(3,597)**	2,100	3,489
Tax benefit from the exercise of stock options	**(3,476)**	(3,661)	(6,385)
Non-cash stock compensation	**18,211**	15,262	17,407
Loss on sale of property, plant and equipment	**859**	376	218
Other non-cash	**2,973**	56	406
Changes in operating assets and liabilities:			
Receivables	**(41,247)**	(37,179)	(65,692)
Inventories	**1,784**	(14,208)	(8,699)
Prepaid expenses	**(8,667)**	1,799	(1,852)
Other noncurrent assets	**7,773**	1,733	(232)
Accounts payable	**7,296**	(1,261)	6,906
Income taxes payable	**(2,684)**	15,616	9,524
Accrued liabilities	**23,328**	5,817	27,932
Customer advance payments	**3,631**	(1,062)	(2,103)
Other noncurrent liabilities	**(17,739)**	2,830	59
Other	**(1,301)**	(3,586)	(217)
Net cash provided by operating activities	**331,158**	261,951	288,155
Cash flows from investing activities:			
Additions to property, plant and equipment	**(60,851)**	(62,087)	(43,574)
Proceeds from sale of property, plant and equipment	**1,300**	597	323
Acquisition of businesses, net of cash acquired	**(42,650)**	(75,565)	(186,420)
Equity investments	**—**	(1,480)	(854)
Net cash used in investing activities	**(102,201)**	(138,535)	(230,525)
Cash flows from financing activities:			
Proceeds from short-term borrowings	**13,456**	59,870	108,679
Repayment of short-term borrowings	**(12,059)**	(164,716)	(6,093)
Proceeds from long-term debt	**261,161**	719,534	158,828
Repayment of long-term debt	**(392,775)**	(289,202)	(107,591)
Repayment of capital lease obligations	**(5,059)**	(5,240)	(5,854)
Payment of debt issuance costs	**(99)**	(1,557)	—
Issuance of common shares	**11,476**	5,372	7,013
Purchase of treasury shares	**(33,421)**	(383,851)	(166,434)
Tax benefit from the exercise of stock options	**3,476**	3,661	6,385
Dividends paid	**(56,436)**	(54,849)	(48,391)
Net cash used in financing activities	**(210,280)**	(110,978)	(53,458)
Effect of exchange rate changes on cash	**(1,706)**	(4,484)	(4,233)
Increase (decrease) in cash and cash equivalents	**16,971**	7,954	(61)
Cash and cash equivalents at beginning of year	**50,268**	42,314	42,375
Cash and cash equivalents at end of year	**$ 67,239**	$ 50,268	$ 42,314

The accompanying notes are an integral part of the consolidated financial statements.

Notes to Consolidated Financial Statements

NOTE REGARDING AMOUNTS AND FISCAL YEAR REFERENCES

In this annual report, all amounts related to United States dollars and foreign currency and to the number of Nordson Corporation's common shares, except for per share earnings and dividend amounts, are expressed in thousands. Unless the context otherwise indicates, all references to "we" or the "Company" mean Nordson Corporation.

Unless otherwise noted, all references to years relate to our fiscal year.

Note 1 — Significant accounting policies

Consolidation — The consolidated financial statements include the accounts of Nordson Corporation and its majority-owned and controlled subsidiaries. Investments in affiliates and joint ventures in which our ownership is 50 percent or less or in which we do not have control but have the ability to exercise significant influence, are accounted for under the equity method. All significant intercompany accounts and transactions have been eliminated in consolidation.

Use of estimates — The preparation of financial statements in conformity with generally accepted accounting principles in the United States requires management to make estimates and assumptions that affect the amounts reported in the consolidated financial statements and notes. Actual amounts could differ from these estimates.

Fiscal year — Our fiscal year is November 1 through October 31.

Revenue recognition — Most of our revenues are recognized upon shipment, provided that persuasive evidence of an arrangement exists, the sales price is fixed or determinable, collectibility is reasonably assured, and title and risk of loss have passed to the customer.

Certain arrangements may include installation, installation supervision, training, and spare parts, which tend to be completed in a short period of time, at an insignificant cost, and utilizing skills not unique to us, therefore, are typically regarded as inconsequential or perfunctory. Revenue for undelivered items is deferred and included within accrued liabilities in the accompanying balance sheet. Revenues deferred in 2016, 2015 and 2014 were not material.

Shipping and handling costs — Amounts billed to customers for shipping and handling are recorded as revenue. Shipping and handling expenses are included in cost of sales.

Advertising costs — Advertising costs are expensed as incurred and were $11,095, $11,943 and $10,823 in 2016, 2015 and 2014, respectively.

Research and development — Research and development costs are expensed as incurred and were $46,247, $46,689 and $47,536 in 2016, 2015 and 2014, respectively.

Earnings per share — Basic earnings per share are computed based on the weighted-average number of common shares outstanding during each year, while diluted earnings per share are based on the weighted-average number of common shares and common share equivalents outstanding. Common share equivalents consist of shares issuable upon exercise of stock options computed using the treasury stock method, as well as restricted stock and deferred stock-based compensation. Options whose exercise price is higher than the average market price are excluded from the calculation of diluted earnings per share because the effect would be anti-dilutive. Options for 396, 373 and 69 common shares were excluded from the diluted earnings per share calculation in 2016, 2015 and 2014, respectively, because their effect would have been anti-dilutive. Under the 2012 Stock Incentive and Award Plan, executive officers and selected other key employees receive common share awards based on corporate performance measures over three-year performance periods. Awards for which performance measures have not been met were excluded from the calculation of diluted earnings per share.

Notes to Consolidated Financial Statements — *(Continued)*

Cash and cash equivalents — Highly liquid instruments with maturities of 90 days or less at date of purchase are considered to be cash equivalents. Cash and cash equivalents are carried at cost, which approximates fair value.

Allowance for doubtful accounts — An allowance for doubtful accounts is maintained for estimated losses resulting from the inability of customers to make required payments. The amount of the allowance is determined principally on the basis of past collection experience and known factors regarding specific customers. Accounts are written off against the allowance when it becomes evident that collection will not occur.

Inventories — Inventories are valued at the lower of cost or market. Cost was determined using the last-in, first-out (LIFO) method for 20 percent of consolidated inventories at October 31, 2016 and 2015. The first-in, first-out (FIFO) method is used for all other inventories. Consolidated inventories would have been $7,400 and $7,638 higher than reported at October 31, 2016 and 2015, respectively, had the FIFO method, which approximates current cost, been used for valuation of all inventories.

Property, plant and equipment and depreciation — Property, plant and equipment are carried at cost. Additions and improvements that extend the lives of assets are capitalized, while expenditures for repairs and maintenance are expensed as incurred. Plant and equipment are depreciated for financial reporting purposes using the straight-line method over the estimated useful lives of the assets or, in the case of property under capital leases, over the terms of the leases. Leasehold improvements are depreciated over the shorter of the lease term or their useful lives. Useful lives are as follows:

Land improvements	15-25 years
Buildings	20-40 years
Machinery and equipment	3-18 years
Enterprise management systems	5-13 years

Depreciation expense is included in cost of sales and selling and administrative expenses.

Internal use software costs are expensed or capitalized depending on whether they are incurred in the preliminary project stage, application development stage or the post-implementation stage. Amounts capitalized are amortized over the estimated useful lives of the software beginning with the project's completion. All re-engineering costs are expensed as incurred. Interest costs on significant capital projects are capitalized. No interest was capitalized in 2016, 2015 or 2014.

Goodwill and intangible assets — Goodwill is the excess of cost of an acquired entity over the amounts assigned to assets acquired and liabilities assumed in a business combination. Goodwill relates to and is assigned directly to specific reporting units. Goodwill is not amortized but is subject to annual impairment testing. Our annual impairment testing is performed as of August 1. Testing is done more frequently if an event occurs or circumstances change that would indicate the fair value of a reporting unit is less than the carrying amount of those assets.

Other amortizable intangible assets, which consist primarily of patent/technology costs, customer relationships, noncompete agreements, and trade names, are amortized over their useful lives on a straight-line basis. At October 31, 2016, the weighted-average useful lives for each major category of amortizable intangible assets were:

Patent/technology costs	13 years
Customer relationships	14 years
Noncompete agreements	3 years
Trade names	16 years

Foreign currency translation — The financial statements of subsidiaries outside the United States are generally measured using the local currency as the functional currency. Assets and liabilities of these subsidiaries are translated at the rates of exchange at the balance sheet dates. Income and expense items are translated at average monthly rates of exchange. The resulting translation adjustments are included in accumulated other comprehensive income (loss), a separate component of shareholders' equity. Generally, gains and losses from foreign currency transactions, including forward contracts, of these subsidiaries and the United States parent are included in net income. Gains and losses from intercompany foreign currency transactions of a long-term investment nature are included in accumulated other comprehensive income (loss).

Accumulated other comprehensive loss — Accumulated other comprehensive loss at October 31, 2016 and 2015 consisted of:

	Cumulative translation adjustments	Pension and postretirement benefit plan adjustments	Accumulated other comprehensive loss
Balance at October 31, 2015	$(42,427)	$(102,259)	$(144,686)
Pension and postretirement plan changes, net of tax of $(8,416)	—	(14,868)	(14,868)
Currency translation losses	(8,693)	—	(8,693)
Balance at October 31, 2016	$(51,120)	$(117,127)	$(168,247)

Warranties — We offer warranties to our customers depending on the specific product and terms of the customer purchase agreement. A typical warranty program requires that we repair or replace defective products within a specified time period (generally one year) measured from the date of delivery or first use. We record an estimate for future warranty-related costs based on actual historical return rates. Based on analysis of return rates and other factors, the adequacy of our warranty provisions are adjusted as necessary. The liability for warranty costs is included in accrued liabilities in the Consolidated Balance Sheet.

Following is a reconciliation of the product warranty liability for 2016 and 2015:

	2016	2015
Balance at beginning of year	**$ 10,537**	$ 9,918
Accruals for warranties	**14,487**	12,531
Warranty assumed from acquisitions	**—**	11
Warranty payments	**(12,575)**	(11,487)
Currency adjustments	**(679)**	(436)
Balance at end of year	**$ 11,770**	$ 10,537

Note 2 — Recently issued accounting standards

In May 2014, the Financial Accounting Standards Board (FASB) issued a new standard regarding revenue recognition. Under this standard, a company recognizes revenue when it transfers promised goods or services to customers in an amount that reflects the consideration to which the company expects to be entitled in exchange for those goods or services. The standard implements a five-step process for customer contract revenue recognition that focuses on transfer of control. In August 2015, the FASB issued a standard to delay the effective date by one year. In accordance with this delay, the new standard is effective for us beginning in the first quarter of 2019. Early adoption is permitted, but not before the original effective date of the standard. The new standard is required to be applied retrospectively to each prior reporting period presented or retrospectively with the cumulative effect of initially applying it recognized at the date of initial application. We are performing a preliminary review of the new guidance as compared to our current accounting policies. We are currently assessing the impact this standard, along with the subsequent updates and clarifications, will have on our consolidated financial statements and disclosures. During 2017, we plan to assess our contracts and consider our method of adoption.

In April 2015, the FASB issued a new standard regarding the presentation of debt issuance costs. Under this standard, a company is required to present unamortized debt issuance costs related to a recognized debt liability in the balance sheet as a direct deduction from the carrying amount of that debt liability, rather than as a separate asset. The recognition and measurement guidance for debt issuance costs are not affected by this new standard.

In August 2015, the FASB issued an amendment to this standard, which added clarification to the presentation of debt issuance costs. This amendment allows debt issuance costs related to line-of-credit arrangements to be presented as an asset and subsequently amortized ratably over the term of the line-of-credit agreement, regardless of whether there are any outstanding borrowings on the line-of-credit arrangement. It will be effective for us beginning in 2017. We do not expect this standard to have a material impact on our consolidated financial statements as it will only impact presentation.

In July 2015, the FASB issued a new standard regarding the measurement of inventory. Under this standard, inventory that is measured using the first-in, first-out ("FIFO") or average cost methods is required to be measured at the lower of cost or net realizable value. Net realizable value is the estimated selling price in the ordinary course of business, less reasonably predictable costs of completion, disposal and transportation. This standard does not impact inventory measured on a last-in, last-out ("LIFO") method. It will be effective for us beginning in 2017. We do not expect this standard to have a material impact on our consolidated financial statements.

In September 2015, the FASB issued a new standard intended to simplify the accounting for measurement period adjustments in a business combination. Measurement period adjustments are changes to provisional amounts recorded when the accounting for a business combination is incomplete as of the end of a reporting period. The measurement period can extend for up to a year following the transaction date. During the measurement period, companies may make adjustments to provisional amounts when information necessary to complete the measurement is received. The new guidance requires companies to recognize these adjustments, including any related impacts to net income, in the reporting period in which the adjustments are determined. Companies are no longer required to retroactively apply measurement period adjustments to all periods presented. It will be effective for us beginning in 2017. The new guidance will be applied prospectively and the impact of adoption will be dependent on the nature of measurement period adjustments that may be necessary.

In November 2015, the FASB issued a new standard regarding the balance sheet classification of deferred taxes, which will require entities to present deferred tax assets and liabilities as noncurrent on the balance sheet. This guidance simplifies the current guidance, which requires entities to separately present deferred tax assets and liabilities as current and noncurrent on the balance sheet. We have elected to early adopt this standard prospectively as of October 31, 2016, as is permitted under the standard. Due to the prospective treatment, prior periods presented in these financial statements have not been adjusted.

In February 2016, the FASB issued a new standard which requires a lessee to recognize on the balance sheet the assets and liabilities for the rights and obligations created by those leases with a lease term of more than twelve months. Leases will continue to be classified as either financing or operating, with classification affecting the recognition, measurement and presentation of expenses and cash flows arising from a lease. It will be effective for us beginning in 2020. We are currently assessing the impact this standard will have on our consolidated financial statements.

In March 2016, the FASB issued a new standard which simplifies the accounting for share-based payment transactions. This guidance requires that excess tax benefits and tax deficiencies be recognized as income tax expense or benefit in the Consolidated Statements of Income rather than additional paid-in capital. Additionally, the excess tax benefits will be classified along with other income tax cash flows as an operating activity, rather than a financing activity, on the Statement of Cash Flows. Further, the update allows an entity to make a policy election to recognize forfeitures as they occur or estimate the number of awards expected to be forfeited. It will be effective for us beginning in 2018 and should be applied prospectively, with certain cumulative effect adjustments. Early adoption is permitted. We are currently assessing the impact this standard will have on our consolidated financial statements.

Note 3 — Severance and restructuring costs

During the fourth quarter of 2016, we implemented an initiative within our Adhesive Dispensing Systems segment to consolidate certain polymer processing product line facilities in the U.S. This initiative is designed to improve customer experience, accelerate growth, optimize performance and realize synergies for sustained long-term success. Costs of $5,565 were recognized in 2016 relating to this initiative, which consisted primarily of severance costs. Payments of $624 related to these actions were paid during 2016. Additional costs related to this initiative are not expected to be material in future periods. Cash payments related to this initiative are expected to be paid during 2017 and 2018.

The following table summarizes severance and restructuring activity during 2016 related this action:

	Employee severance charges	Other one-time costs	Total
Accrual Balance at October 31, 2015	$ —	$ —	$ —
Charged to expense	4,576	989	5,565
Cash payments	—	(624)	(624)
Non cash utilization	—	(261)	(261)
Accrual Balance at October 31, 2016	$4,576	$ 104	$4,680

During the second half of 2015, we implemented initiatives across each of our segments to optimize operations and to enhance operational efficiency and customer service. Costs of $5,210 and $11,411 were recognized in 2016 and 2015, respectively, related to these initiatives, which consisted primarily of severance costs.

Within the Adhesives Dispensing Systems segment, restructuring initiatives to optimize operations in the U.S. and Belgium resulted in costs of $2,235 and $7,972 in 2016 and 2015, respectively. Payments of $7,586 related to these actions were paid during 2016.

Within the Advanced Technology Systems segment, a restructuring initiative to enhance operational efficiency and customer service resulted in costs of $1,054 and $3,060 in 2016 and 2015, respectively. Payments of 3,144 related to these actions were paid during 2016.

Within the Industrial Coating Systems segment, a restructuring program to enhance operational efficiency and customer service resulted in severance costs of $1,921 and $379 in 2016 and 2015, respectively. Payments of $1,844 related to these actions were paid during 2016.

Total costs for these actions to-date have been $16,621, which include $12,592 of severance costs, $759 of fixed asset impairment charges, $1,383 of lease termination costs and $1,887 of other one-time restructuring costs.

The following table summarizes severance and restructuring activity during 2016 related to actions initiated in 2015:

	Fixed asset impairment charges	Employee severance charges	Lease termination charges	Other one-time costs	Total
Accrual Balance at October 31, 2015	$ —	$ 7,908	$ 1,322	$ 244	$ 9,474
Charged to expense	205	3,562	61	1,382	5,210
Cash payments	—	(10,334)	(1,240)	(1,000)	(12,574)
Non cash utilization	(205)	—	—	(129)	(334)
Accrual Balance at October 31, 2016	$ —	$ 1,136	$ 143	$ 497	$ 1,776

Additional costs related to these initiatives are not expected to be material in future periods. The remainder of the cash payments related to these initiatives are expected to be paid during the first half of 2017.

Note 4 — Acquisitions

Business acquisitions have been accounted for using the acquisition method, with the acquired assets and liabilities recorded at estimated fair value on the dates of acquisition. The cost in excess of the net assets of the business acquired is included in goodwill. Operating results since the respective dates of acquisitions are included in the Consolidated Statement of Income. Pro-forma results of operations would not have been materially different from reported results and, therefore, are not presented.

2016 acquisition

On September 1, 2016, we purchased 100 percent of the outstanding shares of LinkTech, a Ventura, California designer, manufacturer and distributor of highly engineered precision couplings and fittings. We acquired LinkTech for an aggregate purchase price of $42,650, net of cash acquired of $36. Based on the fair value of the assets acquired and the liabilities assumed, goodwill of $25,169 and identifiable intangible assets of $14,610 were recorded. The identifiable intangible assets consist primarily of $8,600 of customer relationships (amortized over 11 years), $2,800 of tradenames (amortized over 12 years), $2,300 of technology (amortized over 8 years) and $910 of non-compete agreements (amortized over 5 years). Goodwill associated with this acquisition is tax deductible. This acquisition is being reported in our Advanced Technology Systems segment. As of October 31, 2016, the purchase price allocations remain preliminary as we complete our assessments of deferred taxes, intangible assets and certain reserves.

2015 acquisitions

On June 15, 2015, we purchased 100 percent of the outstanding shares of Liquidyn, a German based manufacturer of micro dispensing systems, including micro dispensing pneumatic valves, controllers, and process equipment used in the electronics, automobile, medical, packaging, furniture and aerospace markets. We acquired Liquidyn for an aggregate purchase price of $14,565, net of cash acquired of $657. Based on the fair value of the assets acquired and the liabilities assumed, goodwill of $10,487 and identifiable intangible assets of $3,991 were recorded. The identifiable intangible assets consist primarily of $1,285 of customer relationships (amortized over 6 years), $1,049 of tradenames (amortized over 11 years), $1,421 of technology (amortized over 5 years) and $236 of non-compete agreements (amortized over 2 years). Goodwill associated with this acquisition is not tax deductible. This acquisition is being reported in our Advanced Technology Systems segment.

On August 3, 2015, we purchased 100 percent of the outstanding shares of WAFO, a German based manufacturer and refurbisher of screws and barrels for the synthetic material and rubber industries. We acquired WAFO for an aggregate purchase price of $7,429, net of cash acquired of $236. Based on the fair value of the assets acquired and the liabilities assumed, goodwill of $3,463 and identifiable intangible assets of $1,708 were recorded. The identifiable intangible assets consist of $635 of customer relationships (amortized over 5 years), $679 of tradenames (amortized over 10 years), $142 of technology (amortized over 3 years) and $252 of non-compete agreements (amortized over 3 years). Goodwill associated with this acquisition is not tax deductible. This acquisition is being reported in our Adhesive Dispensing Systems segment.

On September 1, 2015, we purchased 100 percent of the outstanding shares of MatriX, a German based developer of automated in-line and off-line x-ray tools and solutions used for inspection applications. We acquired MatriX for an aggregate purchase price of $53,759, net of cash acquired of $966 and debt assumed of $481. Based on the fair value of the assets acquired and the liabilities assumed, goodwill of $32,439 and identifiable intangible assets of $16,382 were recorded. The identifiable intangible assets consist of $6,485 of customer relationships (amortized over 8 years), $4,046 of tradenames (amortized over 11 years), $5,328 of technology (amortized over 6 years) and $523 of non-compete agreements (amortized over 3 years). Goodwill associated with this acquisition is not tax deductible. This acquisition is being reported in our Advanced Technology Systems segment.

Notes to Consolidated Financial Statements — *(Continued)*

2014 acquisitions

On August 8, 2014, we purchased 100 percent of the outstanding shares of Avalon Laboratories Holding Corp. (Avalon). Avalon, a leading designer and manufacturer of highly specialized catheters and medical tubing products for cardiology, pulmonology and related applications, complements our existing lines of highly engineered, single-use plastic components for fluid management in medical applications. We acquired Avalon for an aggregate purchase price of $179,966, net of cash acquired of $1,324. Based on the fair value of the assets acquired and the liabilities assumed, goodwill of $122,011 and identifiable intangible assets of $52,000 were recorded. The identifiable intangible assets consist of $32,200 of customer relationships (amortized over 10 years), $9,800 of technology (amortized over 10 years) and $10,000 of tradenames (amortized over 15 years). Goodwill associated with this acquisition is not tax deductible; however there is $15,800 from a previous acquisition that is tax deductible.

On August 29, 2014, we purchased 100 percent of the outstanding shares of Dima Group B.V. (Dima), a Netherlands based manufacturer of conformal coating, dispensing and surface mount technology equipment for the global electronics assembly market. We acquired Dima for an aggregate purchase price of $6,454, net of cash acquired of $149. Based on the fair value of the assets acquired and the liabilities assumed, goodwill of $2,380 and identifiable intangible assets of $1,281 were recorded. The identifiable intangible assets consist of $1,017 of customer relationships (amortized over 7 years), and $264 of tradenames (amortized over 15 years). Goodwill associated with this acquisition is not tax deductible.

Both of these acquisitions are being reported in our Advanced Technology Systems segment.

Notes to Consolidated Financial Statements — *(Continued)*

Note 5 — Details of balance sheet

	2016	2015
Receivables:		
Accounts	**$ 415,311**	$ 372,705
Notes	**7,971**	7,303
Other	**10,813**	14,044
	434,095	394,052
Allowance for doubtful accounts	**(5,535)**	(4,502)
	$ 428,560	$ 389,550
Inventories:		
Raw materials and component parts	**$ 85,802**	$ 97,215
Work-in-process	**36,681**	35,509
Finished goods	**134,602**	128,816
	257,085	261,540
Obsolescence and other reserves	**(29,324)**	(28,230)
LIFO reserve	**(7,400)**	(7,638)
	$ 220,361	$ 225,672
Property, plant and equipment:		
Land	**$ 9,914**	$ 9,947
Land improvements	**4,020**	3,926
Buildings	**169,995**	161,924
Machinery and equipment	**372,479**	355,066
Enterprise management system	**50,051**	46,382
Construction-in-progress	**25,873**	17,326
Leased property under capitalized leases	**24,231**	25,684
	656,563	620,255
Accumulated depreciation and amortization	**(383,434)**	(370,315)
	$ 273,129	$ 249,940
Accrued liabilities:		
Salaries and other compensation	**$ 67,257**	$ 54,801
Pension and retirement	**4,046**	1,973
Taxes other than income taxes	**5,955**	6,178
Other	**85,540**	77,979
	$ 162,798	$ 140,931

Notes to Consolidated Financial Statements — *(Continued)*

Note 6 — Goodwill and intangible assets

We account for goodwill and other intangible assets in accordance with the provisions of ASC 350 and account for business combinations using the acquisition method of accounting and accordingly, the assets and liabilities of the entities acquired are recorded at their estimated fair values at the acquisition date. Goodwill is the excess of purchase price over the fair value of tangible and identifiable intangible net assets acquired in various business combinations. Goodwill is not amortized but is tested for impairment annually at the reporting unit level, or more often if indications of impairment exist. We assess the fair value of reporting units on a non-recurring basis using a combination of two valuation methods, a market approach and an income approach, to estimate the fair value of our reporting units. The implied fair value of our reporting units is determined based on significant unobservable inputs; accordingly, these inputs fall within Level 3 of the fair value hierarchy.

Our reporting units are the Adhesive Dispensing Systems segment, the Industrial Coating Systems segment and one level below the Advanced Technology Systems segment.

The goodwill impairment test is a two-step process. In the first step, performed in the fourth quarter of each year, we estimate a reporting unit's fair value using a combination of the discounted cash flow method of the Income Approach and the guideline public company method of the Market Approach and compare the result against the reporting unit's carrying value of net assets. If the carrying value of a reporting unit exceeds its fair value, then a second step is performed to determine if goodwill is impaired. In the second step, a hypothetical purchase price allocation of the reporting unit's assets and liabilities is performed using the fair value calculated in step one. The difference between the fair value of the reporting unit and the hypothetical fair value of assets and liabilities is the implied goodwill amount. Impairment is recorded if the carrying value of the reporting unit's goodwill is higher than its implied goodwill. Based upon results of step one in 2016, 2015 and 2014, the second step of the goodwill impairment test was not necessary.

We acquired LinkTech on September 1, 2016. Determination of the preliminary goodwill associated with this acquisition was completed with the assistance of an independent valuation specialist in the fourth quarter of 2016. Since the date of the valuation, no events or changes in circumstances have occurred that would more likely than not reduce the fair value of this acquisition below its carrying value.

Changes in the carrying amount of goodwill during 2016 by operating segment follow:

	Adhesive Dispensing Systems	Advanced Technology Systems	Industrial Coating Systems	Total
Balance at October 31, 2015	**$385,975**	**$672,342**	**$24,058**	**$1,082,375**
Acquisition	**—**	**25,169**	**—**	**25,169**
Currency effect	**(242)**	**(165)**	**—**	**(407)**
Balance at October 31, 2016	**$385,733**	**$697,346**	**$24,058**	**$1,107,137**

Changes in the carrying amount of goodwill during 2015 by operating segment follow:

	Adhesive Dispensing Systems	Advanced Technology Systems	Industrial Coating Systems	Total
Balance at October 31, 2014	$397,046	$631,433	$24,058	$1,052,537
Acquisitions	3,463	42,926	—	46,389
Currency effect	(14,534)	(2,017)	—	(16,551)
Balance at October 31, 2015	$385,975	$672,342	$24,058	$1,082,375

Accumulated impairment losses, which were recorded in 2009, were $232,789 at October 31, 2016 and October 31, 2015. Of these losses, $229,173 related to the Advanced Technology Systems segment and $3,616 related to the Industrial Coating Systems segment.

Notes to Consolidated Financial Statements — *(Continued)*

Information regarding intangible assets subject to amortization follows:

	October 31, 2016		
	Carrying Amount	Accumulated Amortization	Net Book Value
Customer relationships	**$207,493**	**$ 71,608**	**$135,885**
Patent/technology costs	**97,640**	**37,873**	**59,767**
Trade name	**85,271**	**22,140**	**63,131**
Noncompete agreements	**9,855**	**8,347**	**1,508**
Other	**1,400**	**1,389**	**11**
Total	**$401,659**	**$141,357**	**$260,302**

	October 31, 2015		
	Carrying Amount	Accumulated Amortization	Net Book Value
Customer relationships	$201,282	$ 56,315	$144,967
Patent/technology costs	98,063	32,764	65,299
Trade name	83,022	17,003	66,019
Noncompete agreements	8,952	7,819	1,133
Other	1,365	1,357	8
Total	$392,684	$115,258	$277,426

Amortization expense for 2016, 2015 and 2014 was $29,061, $27,487 and $25,308 respectively.

Estimated amortization expense for each of the five succeeding years follows:

Year	Amounts
2016	$30,347
2017	$29,944
2018	$29,696
2019	$29,155
2020	$23,749

Note 7 — Retirement, pension and other postretirement plans

Retirement plans — We have funded contributory retirement plans covering certain employees. Our contributions are primarily determined by the terms of the plans, subject to the limitation that they shall not exceed the amounts deductible for income tax purposes. We also sponsor unfunded contributory supplemental retirement plans for certain employees. Generally, benefits under these plans vest gradually over a period of approximately three years from date of employment, and are based on the employee's contribution. The expense applicable to retirement plans for 2016, 2015 and 2014 was approximately $17,194, $15,747 and $14,423, respectively.

Pension plans — We have various pension plans covering a portion of our United States and international employees. Pension plan benefits are generally based on years of employment and, for salaried employees, the level of compensation. Actuarially determined amounts are contributed to United States plans to provide sufficient assets to meet future benefit payment requirements. We also sponsor an unfunded supplemental pension plan for certain employees. International subsidiaries fund their pension plans according to local requirements.

Notes to Consolidated Financial Statements — *(Continued)*

A reconciliation of the benefit obligations, plan assets, accrued benefit cost and the amount recognized in financial statements for pension plans is as follows:

	United States		International	
	2016	**2015**	**2016**	**2015**
Change in benefit obligation:				
Benefit obligation at beginning of year	**$361,039**	$345,479	**$ 90,615**	$ 96,831
Service cost	**11,490**	10,851	**2,448**	2,816
Interest cost	**15,932**	15,037	**2,294**	2,561
Participant contributions	**—**	—	**115**	127
Plan amendments	**173**	—	**(3,050)**	—
Settlements	**—**	—	**—**	(3,260)
Curtailments	**—**	—	**(6,790)**	—
Other	**—**	—	**—**	475
Foreign currency exchange rate change	**—**	—	**(7,675)**	(7,906)
Actuarial loss	**31,781**	1,371	**15,749**	2,751
Benefits paid	**(10,956)**	(11,699)	**(2,310)**	(3,780)
Benefit obligation at end of year	**$409,459**	$361,039	**$ 91,396**	$ 90,615
Change in plan assets:				
Beginning fair value of plan assets	**$295,320**	$277,912	**$ 37,473**	$ 39,618
Actual return on plan assets	**23,280**	5,868	**2,205**	1,960
Company contributions	**26,223**	23,239	**3,793**	4,888
Participant contributions	**—**	—	**115**	127
Settlements	**—**	—	**—**	(3,277)
Other	**—**	—	**(145)**	—
Foreign currency exchange rate change	**—**	—	**(5,527)**	(2,063)
Benefits paid	**(10,956)**	(11,699)	**(2,310)**	(3,780)
Ending fair value of plan assets	**$333,867**	$295,320	**$ 35,604**	$ 37,473
Funded status at end of year	**$ (75,592)**	$ (65,719)	**$(55,792)**	$(53,142)
Amounts recognized in financial statements:				
Noncurrent asset	**$ —**	$ —	**$ —**	$ —
Accrued benefit liability	**(1,000)**	(784)	**(8)**	(7)
Long-term pension and retirement obligations	**(74,592)**	(64,935)	**(55,784)**	(53,135)
Total amount recognized in financial statements	**$ (75,592)**	$ (65,719)	**$(55,792)**	$(53,142)

	United States		International	
	2016	**2015**	**2016**	**2015**
Amounts recognized in accumulated other comprehensive (gain) loss:				
Net actuarial loss	**$134,586**	$114,898	**$35,090**	$30,544
Prior service cost (credit)	**(139)**	(235)	**(3,445)**	(818)
Accumulated other comprehensive loss	**$134,447**	$114,663	**$31,645**	$29,726
Amounts expected to be recognized during next fiscal year:				
Amortization of net actuarial loss	**$ 9,336**	$ 7,691	**$ 2,558**	$ 1,902
Amortization of prior service cost (credit)	**47**	77	**(304)**	(89)
Total	**$ 9,383**	$ 7,768	**$ 2,254**	$ 1,813

The following table summarizes the changes in accumulated other comprehensive (gain) loss:

	United States		International	
	2016	**2015**	**2016**	**2015**
Balance at beginning of year	**$114,663**	$111,290	**$29,726**	$33,688
Net (gain) loss arising during the year	**28,167**	13,820	**8,255**	2,380
Prior service cost (credit) arising during the year	**173**	—	**(3,050)**	—
Net gain (loss) recognized during the year	**(8,480)**	(9,742)	**(1,723)**	(2,268)
Prior service (cost) credit recognized during the year	**(76)**	(121)	**203**	90
Settlement loss	**—**	(516)	**(160)**	(1,319)
Curtailment gain (loss)	**—**	(68)	**1,526**	—
Exchange rate effect during the year	**—**	—	**(3,132)**	(2,845)
Balance at end of year	**$134,447**	$114,663	**$31,645**	$29,726

Information regarding the accumulated benefit obligation is as follows:

	United States		International	
	2016	**2015**	**2016**	**2015**
For all plans:				
Accumulated benefit obligation	**$397,350**	$354,567	**$77,166**	$69,489
For plans with benefit obligations in excess of plan assets:				
Projected benefit obligation	**409,459**	361,039	**90,852**	82,521
Accumulated benefit obligation	**397,350**	354,567	**77,121**	69,444
Fair value of plan assets	**333,867**	295,320	**35,533**	37,424

Notes to Consolidated Financial Statements — *(Continued)*

Net pension benefit costs include the following components:

	United States			International		
	2016	**2015**	**2014**	**2016**	**2015**	**2014**
Service cost	**$ 11,490**	$ 10,851	$ 8,071	**$ 2,448**	$ 2,816	$ 2,597
Interest cost	**15,932**	15,037	13,921	**2,294**	2,561	3,185
Expected return on plan assets	**(19,666)**	(18,316)	(17,297)	**(1,501)**	(1,589)	(1,772)
Amortization of prior service cost (credit)	**76**	121	237	**(203)**	(90)	(101)
Amortization of net actuarial (gain) loss	**8,480**	9,742	7,940	**1,723**	2,285	1,233
Settlement loss	**—**	516	632	**160**	1,319	—
Curtailment (gain) loss	**—**	68	—	**(1,526)**	—	—
Total benefit cost	**$ 16,312**	$ 18,019	$ 13,504	**$ 3,395**	$ 7,302	$ 5,142

Net periodic pension cost for 2016 included a settlement loss of $160 due to lump sum retirement payments and a curtailment gain of $1,526 due to a plan amendment allowing participants to elect a new defined contribution plan or a new defined benefit plan. Net periodic pension cost for 2015 included a settlement loss of $593, due to lump sum retirement payments and $1,242 due to a plan termination.

The weighted average assumptions used in the valuation of pension benefits were as follows:

	United States			International		
	2016	**2015**	**2014**	**2016**	**2015**	**2014**
Assumptions used to determine benefit obligations at October 31:						
Discount rate	**3.94%**	4.39%	4.29%	**1.86%**	2.81%	2.94%
Rate of compensation increase	**3.61**	3.50	3.49	**3.12**	3.22	3.19
Assumptions used to determine net benefit costs for the years ended October 31:						
Discount rate	**4.39**	4.29	4.75	**2.81**	2.94	3.72
Expected return on plan assets	**6.72**	6.76	7.24	**4.22**	4.39	4.60
Rate of compensation increase	**3.50**	3.49	3.30	**3.22**	3.19	3.18

The amortization of prior service cost is determined using a straight-line amortization of the cost over the average remaining service period of employees expected to receive benefits under the plans.

The discount rate reflects the current rate at which pension liabilities could be effectively settled at the end of the year. The discount rate used considers a yield derived from matching projected pension payments with maturities of a portfolio of available bonds that receive the highest rating given from a recognized investments ratings agency. The decrease in the discount rate in 2016 and increase in 2015 are due to changes in yields for these types of investments as a result of the economic environment.

In determining the expected return on plan assets using the calculated value of plan assets, we consider both historical performance and an estimate of future long-term rates of return on assets similar to those in our plans. We consult with and consider the opinions of financial and other professionals in developing appropriate return assumptions. The rate of compensation increase is based on managements' estimates using historical experience and expected increases in rates.

Net actuarial gains or losses are amortized to expense on a plan-by-plan basis when they exceed the accounting corridor, which is set at 10% of the greater of the plan assets or benefit obligations. Gains or losses outside of the corridor are subject to amortization over an average employee future service period that differs by plan. If substantially all of the plan's participants are no longer actively accruing benefits, the average life expectancy is used.

Notes to Consolidated Financial Statements — *(Continued)*

In the fourth quarter of 2016, we adopted a change in the method to be used to estimate the service and interest cost components of net periodic benefit cost for defined benefit pension plans. Historically, for the vast majority of its plans, the service and interest cost components were estimated using a single weighted-average discount rate derived from the yield curve used to measure the benefit obligation at the beginning of the period. Beginning in 2017, we will use a spot rate approach by applying the specific spot rates along the yield curve to the relevant projected cash flows in the estimation of the service and interest components of benefit cost, resulting in a more precise measurement. This change does not affect the measurement of total benefit obligations. The change will be accounted for as a change in estimate that is inseparable from a change in accounting principle and, accordingly, will be accounted for prospectively starting in fiscal year 2017. The spot rates used to determine service and interest costs ranged from 2.4 percent to 3.3 percent for the U.S. pension plans and 0.9 percent to 2.6 percent for the non-U.S. pension plans. The reductions in service and interest costs for 2017 associated with this change in estimate are expected to be $1,000 and $3,200, respectively.

The allocation of pension plan assets as of October 31, 2016 and 2015 is as follows:

	United States		International	
	2016	**2015**	**2016**	**2015**
Asset Category				
Equity securities	**15 %**	19 %	**— %**	— %
Debt securities	**31**	29	**—**	—
Insurance contracts	**—**	—	**59**	54
Pooled investment funds	**53**	51	**39**	46
Other	**1**	1	**2**	—
Total	**100 %**	100 %	**100 %**	100 %

Our investment objective for defined benefit plan assets is to meet the plans' benefit obligations, while minimizing the potential for future required plan contributions.

Our United States plans comprise 90 percent of the worldwide pension assets. In general, the investment strategies focus on asset class diversification, liquidity to meet benefit payments and an appropriate balance of long-term investment return and risk. Target ranges for asset allocations are determined by dynamically matching the actuarial projections of the plans' future liabilities and benefit payments with expected long-term rates of return on the assets, taking into account investment return volatility and correlations across asset classes. For 2016, the target in "return-seeking assets" is 40 percent and 60 percent in fixed income. Plan assets are diversified across several investment managers and are invested in liquid funds that are selected to track broad market indices. Investment risk is carefully controlled with plan assets rebalanced to target allocations on a periodic basis and continual monitoring of investment managers' performance relative to the investment guidelines established with each investment manager.

Our international plans comprise 10 percent of the worldwide pension assets. Asset allocations are developed on a country-specific basis. Our investment strategy is to cover pension obligations with insurance contracts or to employ independent managers to invest the assets.

Notes to Consolidated Financial Statements — *(Continued)*

The fair values of our pension plan assets at October 31, 2016 by asset category are in the table below:

	United States				International			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Cash	$ 896	$ 896	$ —	$ —	$ 798	$798	$ —	$ —
Money market funds	2,471	2,471	—	—	—	—	—	—
Equity securities:								
Basic materials	2,144	2,144	—	—	—	—	—	—
Consumer goods	3,457	3,457	—	—	—	—	—	—
Financial	5,930	5,930	—	—	—	—	—	—
Healthcare	3,344	3,344	—	—	—	—	—	—
Industrial goods	2,671	2,671	—	—	—	—	—	—
Technology	3,490	3,490	—	—	—	—	—	—
Utilities	857	857	—	—	—	—	—	—
Mutual funds	27,220	27,220	—	—	—	—	—	—
Fixed income securities:								
U.S. Government	38,466	6,888	31,578	—	—	—	—	—
Corporate	63,077	—	63,077	—	—	—	—	—
Other	3,403	—	3,403	—	—	—	—	—
Other types of investments:								
Insurance contracts	—	—	—	—	20,927	—	—	20,927
Real estate collective funds	20,402	—	—	20,402	—	—	—	—
Pooled investment funds	155,247	—	155,247	—	13,879	—	13,879	—
Other	792	792	—	—	—	—	—	—
	$333,867	$60,160	$253,305	$20,402	$35,604	$798	$13,879	$20,927

Notes to Consolidated Financial Statements — *(Continued)*

The fair values of our pension plan assets at October 31, 2015 by asset category are in the table below:

	United States				International			
	Total	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3
Cash	$ 1,781	$ 1,781	$ —	$ —	$ 8	$ 8	$ —	$ —
Money market funds	4,286	4,286	—	—	—	—	—	—
Equity securities:								
Basic materials	2,705	2,705	—	—	—	—	—	—
Consumer goods	4,173	4,173	—	—	—	—	—	—
Financial	6,989	6,989	—	—	—	—	—	—
Healthcare	3,436	3,436	—	—	—	—	—	—
Industrial goods	3,105	3,105	—	—	—	—	—	—
Technology	4,080	4,080	—	—	—	—	—	—
Utilities	822	822	—	—	—	—	—	—
Mutual funds	28,112	28,112	—	—	—	—	—	—
Fixed income securities:								
U.S. Government	29,219	7,276	21,943	—	—	—	—	—
Corporate	54,224	—	54,224	—	—	—	—	—
Other	1,546	—	1,546	—	—	—	—	—
Other types of investments:								
Insurance contracts	—	—	—	—	20,432	—	—	20,432
Real estate collective funds	18,827	—	—	18,827	—	—	—	—
Pooled investment funds	131,347	—	131,347	—	17,033	—	17,033	—
Other	668	668	—	—	—	—	—	—
	$295,320	$67,433	$209,060	$18,827	$37,473	$ 8	$17,033	$20,432

These investment funds did not own a significant number of shares of Nordson Corporation common stock for any year presented.

The inputs and methodology used to measure fair value of plan assets are consistent with those described in Note 12. Following are the valuation methodologies used to measure these assets:

- **Money market funds** — Money market funds are public investment vehicles that are valued with a net asset value of one dollar. This is a quoted price in an active market and is classified as Level 1.
- **Equity securities** — Common stocks are valued at the closing price reported on the active market on which the individual securities are traded and are classified as Level 1. Mutual funds are valued at the net asset values of the shares at year-end, as determined by the closing price reported on the active market on which the individual securities are traded and are classified as Level 1.
- **Fixed income securities** — U.S. Treasury bills reflect the closing price on the active market in which the securities are traded and are classified as Level 1. Securities of U.S. agencies are valued using bid evaluations and a classified as Level 2. Corporate fixed income securities are valued using evaluated prices, such as dealer quotes, bids and offers and are therefore classified as Level 2.
- **Insurance contracts** — Insurance contracts are investments with various insurance companies. The contract value represents the best estimate of fair value. These contracts do not hold any specific assets. These investments are classified as Level 3.

- **Real estate collective funds** — These funds are valued at the estimated fair value of the underlying properties. Estimated fair value is calculated using a combination of key inputs, such as revenue and expense growth rates, terminal capitalization rates and discount rates. These investments are classified as Level 3.
- **Pooled investment funds** — These are public investment vehicles valued using the net asset value. The net asset value is based on the value of the assets owned by the plan, less liabilities. These investments are not quoted on an active exchange and are classified as Level 2.

The following tables present an analysis of changes during the years ended October 31, 2016 and 2015 in Level 3 plan assets, by plan asset class, for U.S. and International pension plans using significant unobservable inputs to measure fair value:

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)		
	Real estate collective funds	Insurance contracts	Total
Beginning balance at October 31, 2015	**$18,827**	**$20,432**	**$39,259**
Actual return on plan assets:			
Assets held, end of year	**1,720**	**1,683**	**3,403**
Assets sold during the period	**49**	**—**	**49**
Purchases	**—**	**2,799**	**2,799**
Sales	**(194)**	**(2,140)**	**(2,334)**
Foreign currency translation	**—**	**(1,847)**	**(1,847)**
Ending balance at October 31, 2016	**$20,402**	**$20,927**	**$41,329**

	Fair Value Measurements Using Significant Unobservable Inputs (Level 3)		
	Real estate collective funds	Insurance contracts	Total
Beginning balance at October 31, 2014	$16,495	$23,174	$39,669
Actual return on plan assets:			
Assets held, end of year	2,469	724	3,193
Assets sold during the period	36	7	43
Purchases	—	3,769	3,769
Sales	(173)	(5,763)	(5,936)
Foreign currency translation	—	(1,479)	(1,479)
Ending balance at October 31, 2015	$18,827	$20,432	$39,259

Contributions to pension plans in 2017 are estimated to be approximately $18,000.

Retiree pension benefit payments, which reflect expected future service, are anticipated to be paid as follows:

Year	United States	International
2017	$ 13,103	$ 1,456
2018	14,145	2,208
2019	15,347	3,815
2020	16,616	2,423
2021	17,925	2,588
2022-2026	109,799	16,433

Notes to Consolidated Financial Statements — *(Continued)*

Other postretirement plans — We sponsor an unfunded postretirement health care benefit plan covering certain of our United States employees. Employees hired after January 1, 2002, are not eligible to participate in this plan. For eligible retirees under the age of 65 who enroll in the plan, the plan is contributory in nature, with retiree contributions in the form of premiums that are adjusted annually. For eligible retirees age 65 and older who enroll in the plan, the plan delivers a benefit in the form of a Health Reimbursement Account (HRA), which retirees use for eligible reimbursable expenses, including premiums paid for purchase of a Medicare supplement plan or other out-of-pocket medical expenses such as deductibles or co-pays.

A reconciliation of the benefit obligations, accrued benefit cost and the amount recognized in financial statements for other postretirement plans is as follows:

	United States		International	
	2016	2015	2016	2015
Change in benefit obligation:				
Benefit obligation at beginning of year	**$ 68,315**	$ 69,479	**$ 524**	$ 897
Service cost	**849**	979	**16**	29
Interest cost	**2,923**	2,946	**23**	35
Participant contributions	**446**	412	**—**	—
Foreign currency exchange rate change	**—**	—	**(14)**	(111)
Actuarial (gain) loss	**1,818**	(3,677)	**81**	(321)
Benefits paid	**(2,447)**	(1,824)	**(7)**	(5)
Benefit obligation at end of year	**$ 71,904**	$ 68,315	**$ 623**	$ 524
Change in plan assets:				
Beginning fair value of plan assets	**$ —**	$ —	**$ —**	$ —
Company contributions	**2,001**	1,412	**7**	5
Participant contributions	**446**	412	**—**	—
Benefits paid	**(2,447)**	(1,824)	**(7)**	(5)
Ending fair value of plan assets	**$ —**	$ —	**$ —**	$ —
Funded status at end of year	**$(71,904)**	$(68,315)	**$(623)**	$(524)
Amounts recognized in financial statements:				
Accrued benefit liability	**$ (2,123)**	$ (2,142)	**$ (7)**	$ (7)
Long-term postretirement obligations	**(69,781)**	(66,173)	**(616)**	(517)
Total amount recognized in financial statements	**$(71,904)**	$(68,315)	**$(623)**	$(524)

	United States		International	
	2016	2015	2016	2015
Amounts recognized in accumulated other comprehensive (gain) loss:				
Net actuarial (gain) loss	**$18,786**	$17,652	**$(265)**	$(379)
Prior service credit	**(306)**	(573)	**—**	—
Accumulated other comprehensive (gain) loss	**$18,480**	$17,079	**$(265)**	$(379)
Amounts expected to be recognized during next fiscal year:				
Amortization of net actuarial (gain) loss	**$ 917**	$ 847	**$ (17)**	$ (25)
Amortization of prior service cost (credit)	**(164)**	(267)	**—**	—
Total	**$ 753**	$ 580	**$ (17)**	$ (25)

The following table summarizes the changes in accumulated other comprehensive (gain) loss:

	United States		International	
	2016	**2015**	**2016**	**2015**
Balance at beginning of year	**$17,079**	$21,422	**$(379)**	$ (86)
Net (gain) loss arising during the year	**1,818**	(3,677)	**81**	(321)
Net gain (loss) recognized during the year	**(684)**	(1,104)	**25**	—
Prior service credit recognized during the year	**267**	438	**—**	—
Exchange rate effect during the year	**—**	—	**8**	28
Balance at end of year	**$18,480**	$17,079	**$(265)**	$(379)

Net postretirement benefit costs include the following components:

	United States			International		
	2016	**2015**	**2014**	**2016**	**2015**	**2014**
Service cost	**$ 849**	$ 979	$1,037	**$ 16**	$29	$ 28
Interest cost	**2,923**	2,946	3,062	**23**	35	38
Amortization of prior service credit	**(267)**	(438)	(449)	**—**	—	—
Amortization of net actuarial (gain) loss	**684**	1,104	1,435	**(24)**	—	(13)
Total benefit cost	**$4,189**	$4,591	$5,085	**$ 15**	$64	$ 53

The weighted average assumptions used in the valuation of postretirement benefits were as follows:

	United States			International		
	2016	**2015**	**2014**	**2016**	**2015**	**2014**
Assumptions used to determine benefit obligations at October 31:						
Discount rate	**4.05%**	4.50%	4.40%	**3.40%**	4.35%	4.25%
Health care cost trend rate	**3.63**	3.72	3.93	**6.13**	6.31	6.48
Rate to which health care cost trend rate is assumed to decline (ultimate trend rate)	**3.24**	3.27	3.41	**3.50**	3.50	3.50
Year the rate reaches the ultimate trend rate	**2026**	2025	2024	**2031**	2031	2031
Assumption used to determine net benefit costs for the years ended October 31:						
Discount rate	**4.50%**	4.40%	4.80%	**4.35%**	4.25%	4.95%

The weighted average health care trend rates reflect expected increases in the Company's portion of the obligation.

Net actuarial gains or losses are amortized to expense on a plan-by-plan basis when they exceed the accounting corridor, which is set at 10% of the greater of the plan assets or benefit obligations. Gains or losses outside of the corridor are subject to amortization over an average employee future service period that differs by plan. If substantially all of the plan's participants are no longer actively accruing benefits, the average life expectancy is used.

Similar to the changes in the discount rate approach discussed for the pension plans above, beginning in 2017 we elected to use an approach that discounts the individual expected cash flows underlying interest and service costs using the applicable spot rates derived from the yield curve used to determine the benefit obligation to the relevant projected cash flows. The spot rates used to determine service and interest costs ranged from 3.2 percent to 3.3 percent for the postretirement benefit plans. Based on current economic conditions, the Company estimates that the service cost and interest cost in 2017 will be reduced by approximately $100 and $500, respectively. The Company has accounted for this change in estimate that is inseparable from a change in accounting principle on a prospective basis.

Notes to Consolidated Financial Statements — *(Continued)*

A one-percentage point change in the assumed health care cost trend rate would have the following effects. Bracketed numbers represent decreases in expense and obligation amounts.

	United States		International	
	1% Point Increase	1% Point Decrease	1% Point Increase	1% Point Decrease
Health care trend rate:				
Effect on total service and interest cost components in 2016	$ 628	$ (495)	$ 10	$ (8)
Effect on postretirement obligation as of October 31, 2016	$11,024	$(8,836)	$146	$(113)

Contributions to postretirement plans in 2017 are estimated to be approximately $2,100.

Retiree postretirement benefit payments are anticipated to be paid as follows:

Year	United States	International
2017	$ 2,123	$ 7
2018	2,310	10
2019	2,442	11
2020	2,663	12
2021	2,904	11
2022-2026	17,542	84

Note 8 — Income taxes

Income tax expense includes the following:

	2016	2015	2014
Current:			
U.S. federal	**$ 44,156**	$36,875	$ 52,985
State and local	**2,256**	1,623	1,900
Foreign	**53,836**	49,153	47,366
Total current	**100,248**	87,651	102,251
Deferred:			
U.S. federal	**(2,334)**	4,950	8,695
State and local	**563**	1,031	(1,635)
Foreign	**(1,826)**	(3,881)	(3,571)
Total deferred	**(3,597)**	2,100	3,489
	$ 96,651	$89,751	$105,740

Earnings before income taxes of domestic operations, which are calculated after intercompany profit eliminations, were $156,723, $140,044 and $184,894 in 2016, 2015 and 2014, respectively.

On December 18, 2015, the Protecting Americans from Tax Hikes Act of 2015 was enacted which retroactively reinstated the Federal Research and Development Tax Credit (Federal R&D Tax Credit) as of January 1, 2015, and made it permanent. As a result, our income tax provision for 2016 includes a discrete tax benefit of $2,200 related to 2015. The tax rate for 2016 also includes a discrete tax benefit of $6,154 related to dividends paid from previously taxed foreign earnings generated prior to 2015, and a benefit of $2,682 related to the effective settlement of a tax exam.

On December 19, 2014, the Tax Increase Prevention Act of 2014 was enacted which retroactively reinstated the Federal Research and Development Tax Credit (Federal R&D Tax Credit) from January 1, 2014 to December 31, 2014 and extended certain other tax provisions. As a result, our income tax provision for 2015 included discrete tax benefits of $2,486 primarily related to 2014.

A reconciliation of the U.S. statutory federal rate to the worldwide consolidated effective tax rate follows:

	2016	2015	2014
Statutory federal income tax rate	**35.00%**	35.00%	35.00%
Domestic Production Deduction	**(1.43)**	(1.47)	(1.74)
Foreign tax rate variances, net of foreign tax credits	**(4.59)**	(3.25)	(3.42)
State and local taxes, net of federal income tax benefit	**0.50**	0.43	0.05
Amounts related to prior years	**(1.20)**	(1.04)	(0.24)
Tax benefit from previously taxed dividends paid	**(1.67)**	—	—
Other — net	**(0.38)**	0.16	0.35
Effective tax rate	**26.23%**	29.83%	30.00%

The Domestic Production Deduction, enacted by the American Jobs Creation Act of 2004, allows a deduction with respect to income from certain United States manufacturing activities.

Earnings before income taxes of international operations, which are calculated before intercompany profit elimination entries, were $211,771, $160,818 and $167,619 in 2016, 2015 and 2014, respectively. Deferred income taxes are not provided on undistributed earnings of international subsidiaries that are intended to be permanently invested in their operations. These undistributed earnings represent the post-income tax earnings under U.S. GAAP not adjusted for previously taxed income which aggregated approximately $757,501 and $712,913 at October 31, 2016 and 2015, respectively. Should these earnings be distributed, applicable foreign tax credits, distributions of previously taxed income, and utilization of other attributes would substantially offset taxes due upon the distribution. It is not practical to estimate the amount of additional taxes that might be payable on such undistributed earnings.

At October 31, 2016 and 2015, total unrecognized tax benefits were $3,336 and $6,258, respectively. The amounts that, if recognized, would impact the effective tax rate were $2,775 and $5,650 at October 31, 2016 and 2015, respectively. During 2016, unrecognized tax benefits related primarily to foreign positions and, as recognized, a substantial portion of the gross unrecognized tax benefits were offset against assets recorded in the Consolidated Balance Sheet. A reconciliation of the beginning and ending amount of unrecognized tax benefits for 2016, 2015 and 2014 is as follows:

	2016	2015	2014
Balance at beginning of year	**$ 6,258**	$5,812	$5,717
Additions based on tax positions related to the current year	**522**	288	196
Additions for tax positions of prior years	**310**	331	319
Reductions for tax positions of prior years	**(140)**	(28)	—
Settlements	**(3,091)**	—	(110)
Lapse of statute of limitations	**(523)**	(145)	(310)
Balance at end of year	**$ 3,336**	$6,258	$5,812

At October 31, 2016 and 2015, we had accrued interest and penalty expense related to unrecognized tax benefits of $541 and $2,664, respectively. We include interest accrued related to unrecognized tax benefits in interest expense. Penalties, if incurred, would be recognized as other income (expense).

Notes to Consolidated Financial Statements — *(Continued)*

We are subject to United States Federal income tax as well as income taxes in numerous state and foreign jurisdictions. We are subject to examination in the U.S. by the Internal Revenue Service (IRS) for the 2013 through 2016 tax years; tax years prior to the 2013 year are closed to further examination by the IRS. Generally, major state and foreign jurisdiction tax years remain open to examination for tax years after 2010. Within the next twelve months, it is reasonably possible that certain statute of limitations periods would expire, which could result in a minimal decrease in our unrecognized tax benefits.

Significant components of deferred tax assets and liabilities are as follows:

	2016	2015
Deferred tax assets:		
Employee benefits	**$ 93,837**	$ 84,651
Other accruals not currently deductible for taxes	**16,861**	17,259
Tax credit and loss carryforwards	**11,111**	9,242
Inventory adjustments	**7,915**	6,591
Total deferred tax assets	**129,724**	117,743
Valuation allowance	**(8,304)**	(6,768)
Total deferred tax assets	**121,420**	(110,975)
Deferred tax liabilities:		
Depreciation and amortization	**171,209**	171,234
Other — net	**1,366**	196
Total deferred tax liabilities	**172,575**	171,430
Net deferred tax liabilities	**$ (51,155)**	$ (60,455)

At October 31, 2016, we had $4,112 of tax credit carryforwards of which $103 will expire in 2017 through 2022, and $4,009 of which has an indefinite carryforward period. We also had $5,273 Federal, $73,809 state and $16,121 foreign operating loss carryforwards, of which $79,616 will expire in 2017 through 2036, and $15,587 of which has an indefinite carryforward period. The net change in the valuation allowance was an increase of $1,537 in 2016 and a decrease of $904 in 2015. The valuation allowance of $8,304 at October 31, 2016, related primarily to tax credits and loss carryforwards that may expire before being realized. We continue to assess the need for valuation allowances against deferred tax assets based on determinations of whether it is more likely than not that deferred tax benefits will be realized.

Notes to Consolidated Financial Statements — *(Continued)*

Note 9 — Notes payable

Bank lines of credit and notes payable are summarized as follows:

	2016	2015
Maximum borrowings under bank lines of credit (all foreign banks)	**$61,519**	$45,102
Outstanding notes payable (all foreign bank debt)	**$ 2,141**	$ 1,108
Weighted-average interest rate on notes payable	**4.35%**	2.75%
Unused bank lines of credit	**$59,378**	$43,994

In 2014, we entered into a 364-day unsecured credit facility with PNC Bank National Association. In August 2014, we borrowed $100,000 under this facility to partially fund the Avalon acquisition. In January 2015, we amended the agreement and borrowed an additional $50,000 to fund daily operations. In April 2015, we paid down $100,000 of the $150,000 outstanding. In May 2015, we paid down the remaining $50,000 outstanding.

Note 10 — Long-term debt

A summary of long-term debt is as follows:

	2016	2015
Revolving credit agreement, due 2020	**$244,680**	$ 457,025
Senior notes, due 2017-2025	**200,000**	200,000
Senior notes, due 2019-2027	**100,000**	100,000
Term loan, due 2018-2020	**200,000**	200,000
Euro loan, due 2019	**79,389**	77,042
Euro loan, due 2016	**—**	11,501
Private shelf facility, due 2017-2026	**157,222**	67,778
Development loans, due 2017-2026	**1,344**	1,467
Other	**11**	672
	982,646	1,115,485
Less current maturities	**38,093**	22,842
Long-term maturities	**$944,553**	$1,092,643

Revolving credit agreement — This $600,000 unsecured multi-currency revolving credit agreement is with a group of banks and expires in February 2020. Payment of quarterly fees is required. The interest rate is variable based upon the LIBOR rate. The weighted average interest rate for borrowings under this agreement was 1.53 percent at October 31, 2016.

Senior notes, due 2017-2025 — These fixed-rate notes entered into in 2012 with a group of insurance companies had a remaining weighted-average life of 4.51 years. The weighted-average interest rate at October 31, 2016 was 2.93 percent.

Notes to Consolidated Financial Statements — *(Continued)*

Senior notes, due 2019-2027 — These fixed-rate notes entered into in 2015 with a group of insurance companies had a remaining weighted-average life of 7.24 years. The weighted-average interest rate at October 31, 2016 was 3.04 percent.

Term loan, due 2018-2020 — In 2015, we entered into a $200,000 term loan facility with a group of banks. The interest rate is variable based upon the LIBOR rate. $100,000 is due in three years with a weighted-average interest rate of 1.53 percent and $100,000 is due in five years with a weighted-average interest rate of 1.63 percent.

Euro loan, due 2019 — This Euro denominated loan was entered into in 2015 with Bank of America Merrill Lynch International Limited. It can be extended by one year at the end of the third and fourth anniversaries. The loan was amended in 2016 to extend the term by one year and increase the principal amount. The interest rate is variable based upon the EUR LIBOR rate. The weighted average interest rate at October 31, 2016 was 1.00 percent.

Euro loan, due 2016 — This Euro denominated loan was entered into in 2013 with The Bank of Tokyo-Mitsubishi UFJ, Ltd. It could be extended by one year at the end of the third and fourth anniversaries. The interest rate was variable based upon the EUR LIBOR rate. We paid down the remaining balance of the loan in 2016.

Private shelf facility — In 2011, we entered into a $150,000 three-year Private Shelf Note agreement with New York Life Investment Management LLC (NYLIM). The amount of the facility was increased to $180,000 in 2015, and then increased to $200,000 in 2016. Borrowings under the agreement may be up to 12 years and are unsecured. The interest rate on each borrowing is fixed based upon the market rate at the borrowing date or is variable based upon the LIBOR rate. At October 31, 2016, the amount outstanding under this facility was at fixed rates of 2.21 percent and 2.56 percent and at variable rates of 1.78 percent and 2.12 percent.

Development loans, due 2011-2026 — These fixed-rate loans with the State of Ohio and Cuyahoga County, Ohio were issued in 2011 in connection with the construction of our corporate headquarters building and are payable in monthly installments over 15 years beginning in 2011. The interest rate on the State of Ohio loan is 3.00 percent, and the interest rate on the Cuyahoga County loan is 3.50 percent.

Annual maturities — The annual maturities of long-term debt for the five years subsequent to October 31, 2016, are as follows: $38,093 in 2017; $126,587 in 2018; and $108,123 in 2019; $413,418 in 2020 and $38,187 in 2021.

Note 11 — Leases

We have lease commitments expiring at various dates, principally for manufacturing, warehouse and office space, automobiles and office equipment. Many leases contain renewal options and some contain purchase options and residual guarantees.

Rent expense for all operating leases was approximately $18,047, $15,721 and $15,135 in 2016, 2015 and 2014, respectively.

Amortization of assets recorded under capital leases is recorded in depreciation expense.

Assets held under capitalized leases and included in property, plant and equipment are as follows:

	2016	2015
Transportation equipment	**$ 15,991**	$ 15,614
Other	**8,240**	10,070
Total capitalized leases	**24,231**	25,684
Accumulated amortization	**(10,235)**	(10,743)
Net capitalized leases	**$ 13,996**	$ 14,941

At October 31, 2016, future minimum lease payments under non-cancelable capitalized and operating leases are as follows:

	Capitalized Leases	Operating Leases
Year:		
2017	$ 5,966	$13,725
2018	4,077	9,559
2019	2,258	8,279
2020	899	5,965
2021	647	4,742
Later years	5,383	11,295
Total minimum lease payments	19,230	$53,565
Less amount representing executory costs	1,722	
Net minimum lease payments	17,508	
Less amount representing interest	3,350	
Present value of net minimum lease payments	14,158	
Less current portion	4,444	
Long-term obligations at October 31, 2016	$ 9,714	

Note 12 — Fair value measurements

The inputs to the valuation techniques used to measure fair value are classified into the following categories:

Level 1: Quoted market prices in active markets for identical assets or liabilities.

Level 2: Observable market based inputs or unobservable inputs that are corroborated by market data.

Level 3: Unobservable inputs that are not corroborated by market data.

The following table presents the classification of our assets and liabilities measured at fair value on a recurring basis at October 31, 2016:

	Total	Level 1	Level 2	Level 3
Assets:				
Foreign currency forward contracts[(a)]	$ 2,805	$ —	$ 2,805	$ —
Total assets at fair value	$ 2,805	$ —	$ 2,805	$ —
Liabilities:				
Deferred compensation plans[(b)]	$ 9,837	$ —	$ 9,837	$ —
Foreign currency forward contracts[(a)]	2,844	—	2,844	—
Total liabilities at fair value	$12,681	$ —	$12,681	$ —

(a) We enter into foreign currency forward contracts to reduce the risk of foreign currency exposures resulting from receivables, payables, intercompany receivables, intercompany payables and loans denominated in foreign currencies. Foreign exchange contracts are valued using market exchange rates. These foreign exchange contracts are not designated as hedges.

(b) Executive officers and other highly compensated employees may defer up to 100 percent of their salary and annual cash incentive compensation and for executive officers, up to 90 percent of their long-term incentive compensation, into various non-qualified deferred compensation plans. Deferrals can be allocated to various market performance measurement funds. Changes in the value of compensation deferred under these plans are recognized each period based on the fair value of the underlying measurement funds.

Fair value disclosures related to goodwill and indefinite-lived intangible assets are disclosed in Note 6.

Note 13 — Financial instruments

We operate internationally and enter into intercompany transactions denominated in foreign currencies. Consequently, we are subject to market risk arising from exchange rate movements between the dates foreign currency transactions occur and the dates they are settled. We regularly use foreign currency forward contracts to reduce our risks related to most of these transactions. These contracts usually have maturities of 90 days or less and generally require us to exchange foreign currencies for U.S. dollars at maturity, at rates stated in the contracts. These contracts are not designated as hedging instruments under U.S. GAAP. Accordingly, the changes in the fair value of the foreign currency forward contracts are recognized in each accounting period in "other — net" on the Consolidated Statement of Income together with the transaction gain or loss from the related balance sheet position. In 2016, we recognized net gains of $2,317 on foreign currency forward contracts and net losses of $312 from the change in fair value of balance sheet positions. In 2015, we recognized net losses of $3,866 on foreign currency forward contracts and net gains of $3,862 from the change in fair value of balance sheet positions. In 2014, we recognized net losses of $826 on foreign currency forward contracts and net gains of $348 from the change in fair value of balance sheet positions.

The following table summarizes, by currency, the contracts outstanding at October 31, 2016 and 2015:

	Sell		Buy	
	Notional Amounts	Fair Market Value	Notional Amounts	Fair Market Value
October 31, 2016 contract amounts:				
Euro	**$107,860**	**$105,635**	**$ 51,377**	**$ 50,495**
Pound sterling	**36,692**	**36,125**	**37,473**	**36,302**
Japanese yen	**31,844**	**31,000**	**23,998**	**23,185**
Australian dollar	**380**	**380**	**8,096**	**8,095**
Hong Kong dollar	**1,702**	**1,702**	**79,516**	**79,411**
Singapore dollar	**1,031**	**995**	**12,062**	**11,735**
Others	**1,863**	**1,832**	**32,511**	**32,066**
Total	**$181,372**	**$177,669**	**$245,033**	**$241,289**
October 31, 2015 contract amounts:				
Euro	$182,503	$180,406	$188,021	$184,174
Pound sterling	55,234	55,543	37,714	37,513
Japanese yen	17,046	17,067	13,646	13,706
Australian dollar	—	—	7,120	6,981
Hong Kong dollar	—	—	59,734	59,739
Singapore dollar	858	857	11,519	11,561
Others	3,018	2,993	29,744	29,674
Total	$258,659	$256,866	$347,498	$343,348

Notes to Consolidated Financial Statements — *(Continued)*

We also use intercompany foreign currency transactions of a long-term investment nature to hedge the value of investment in wholly-owned subsidiaries. For hedges of the net investment in foreign operations, realized and unrealized gains and losses are shown in the cumulative translation adjustment account included in total comprehensive income. For 2016 and 2015, net gains of $2,439 and $427, respectively, were included in the cumulative translation adjustment account related to foreign denominated fixed-rate debt designated as a hedge of net investment in foreign operations.

We are exposed to credit-related losses in the event of nonperformance by counterparties to financial instruments. These financial instruments include cash deposits and foreign currency forward contracts. We periodically monitor the credit ratings of these counterparties in order to minimize our exposure. Our customers represent a wide variety of industries and geographic regions. As of October 31, 2016, there were no significant concentrations of credit risk.

The carrying amounts and fair values of financial instruments, other than receivables and accounts payable, are shown in the table below. The carrying values of receivables and accounts payable approximate fair value due to the short-term nature of these instruments.

	2016		2015	
	Carrying Amount	Fair Value	Carrying Amount	Fair Value
Cash and cash equivalents	**$ 67,239**	**$ 67,239**	$ 50,268	$ 50,268
Notes payable	**2,141**	**2,141**	1,108	1,108
Long-term debt (including current portion)	**982,646**	**992,060**	1,115,485	1,113,140
Foreign currency forward contracts (net)	**(39)**	**(39)**	(2,356)	(2,356)

We used the following methods and assumptions in estimating the fair value of financial instruments:

- Cash, cash equivalents and notes payable are valued at their carrying amounts due to the relatively short period to maturity of the instruments.
- Long-term debt is valued by discounting future cash flows at currently available rates for borrowing arrangements with similar terms and conditions, which are considered to be Level 2 inputs under the fair value hierarchy.
- Foreign currency forward contracts are estimated using quoted exchange rates, which are considered to be Level 2 inputs under the fair value hierarchy.

Note 14 — Capital shares

Preferred — We have authorized 10,000 Series A convertible preferred shares without par value. No preferred shares were outstanding in 2016, 2015 or 2014.

Common — We have 160,000 authorized common shares without par value. At October 31, 2016 and 2015, there were 98,023 common shares issued. At October 31, 2016 and 2015, the number of outstanding common shares, net of treasury shares, was 57,307 and 57,358, respectively.

Common shares repurchased as part of publicly announced programs during 2016, 2015 and 2014 were as follows:

Year	Number of Shares	Total Amount	Average per Share
2016	**447**	**$ 31,877**	**$71.37**
2015	5,360	$381,598	$71.19
2014	2,224	$163,584	$73.55

Note 15 — Stock-based compensation

During the 2013 Annual Meeting of Shareholders, our shareholders approved the 2012 Stock Incentive and Award Plan (the "2012 Plan"). The 2012 Plan provides for the granting of stock options, stock appreciation rights, restricted stock, performance shares, stock purchase rights, stock equivalent units, cash awards and other stock or performance-based incentives. A maximum of 2,900 common shares is available for grant under the Plan.

Stock options — Nonqualified or incentive stock options may be granted to our employees and directors. Generally, options granted to employees may be exercised beginning one year from the date of grant at a rate not exceeding 25 percent per year and expire 10 years from the date of grant. For grants made prior to November 2012, vesting ceases upon retirement, death and disability, and unvested shares are forfeited. For grants made during or after November 2012, in the event of termination of employment due to early retirement or normal retirement at age 65, options granted within 12 months prior to termination are forfeited, and vesting continues post retirement for all other unvested options granted. In the event of disability or death, all unvested stock options fully vest. Termination for any other reason results in forfeiture of unvested options and vested options in certain circumstances. The amortized cost of options is accelerated if the retirement eligibility date occurs before the normal vesting date. Option exercises are satisfied through the issuance of treasury shares on a first-in, first-out basis. We recognized compensation expense related to stock options of $7,874, $8,772 and $10,251 for 2016, 2015 and 2014, respectively. The increase in the 2014 expense was primarily related to accelerated amortization of the cost of options.

The following table summarizes activity related to stock options during 2016:

	Number of Options	Weighted-Average Exercise Price Per Share	Aggregate Intrinsic Value	Weighted-Average Remaining Term
Outstanding at October 31, 2015	1,759	$50.74		
Granted	490	$70.91		
Exercised	(333)	$35.12		
Forfeited or expired	(35)	$69.23		
Outstanding at October 31, 2016	1,881	$58.41	$78,461	6.4 years
Vested at October 31, 2016 or expected to vest	1,861	$58.27	$77,925	6.4 years
Exercisable at October 31, 2016	996	$45.90	$54,031	4.7 years

Summarized information on currently outstanding options follows:

	Range of Exercise Price		
	$14 — $28	$29 — $44	$45 — $81
Number outstanding	236	434	1,211
Weighted-average remaining contractual life, in years	2.4	4.4	7.9
Weighted-average exercise price	$22.68	$41.49	$71.44
Number exercisable	236	434	326
Weighted-average exercise price	$22.68	$41.49	$68.53

As of October 31, 2016, there was $5,498 of total unrecognized compensation cost related to nonvested stock options. That cost is expected to be amortized over a weighted average period of approximately 1.6 years.

Notes to Consolidated Financial Statements — *(Continued)*

The Black-Scholes option valuation model was developed for use in estimating the fair value of traded options that have no vesting restrictions and are fully transferable. Option valuation models require the input of highly subjective assumptions, including the expected stock price volatility. The fair value of each option grant was estimated at the date of grant using the Black-Scholes option-pricing model with the following assumptions:

	2016	2015	2014
Expected volatility	**29.1%-30.4%**	30.3%-39.5%	40.1%-44.7%
Expected dividend yield	**1.54%**	1.06%-1.10%	0.98%-1.03%
Risk-free interest rate	**1.78%-1.90%**	1.57%-1.85%	1.51%-1.79%
Expected life of the option (in years)	**5.4-6.2**	5.4-6.1	5.4-6.1

The weighted-average expected volatility used to value options granted in 2016, 2015 and 2014 was 29.6 percent, 34.3 percent and 44.5 percent, respectively.

Historical information was the primary basis for the selection of the expected volatility, expected dividend yield and the expected lives of the options. The risk-free interest rate was selected based upon yields of United States Treasury issues with terms equal to the expected life of the option being valued.

The weighted average grant date fair value of stock options granted during 2016, 2015 and 2014 was $18.23, $24.63 and $27.92, respectively.

The total intrinsic value of options exercised during 2016, 2015 and 2014 was $17,271, $10,406 and $17,223, respectively.

Cash received from the exercise of stock options for 2016, 2015 and 2014 was $11,476, $5,372 and $7,013, respectively. The tax benefit realized from tax deductions from exercises for 2016, 2015 and 2014 was $3,476, $3,661 and $6,385, respectively.

Restricted shares and restricted share units — We may grant restricted shares and/or restricted share units to our employees and directors. These shares or units may not be transferred for a designated period of time (generally one to three years) defined at the date of grant.

For employee recipients, in the event of termination of employment due to early retirement, restricted shares granted within 12 months prior to termination are forfeited, and other restricted shares vest on a pro-rata basis. In the event of termination of employment due to normal retirement at age 65, restricted shares granted within 12 months prior to termination are forfeited, and, for other restricted shares, the restriction period will lapse and the shares will vest and be transferable. Restrictions lapse in the event of a recipient's disability or death. Termination for any other reason prior to the lapse of any restrictions results in forfeiture of the shares.

For non-employee directors, all restrictions lapse in the event of disability or death. Termination of service as a director for any other reason within one year of date of grant results in a pro-rata vesting of shares or units.

As shares or units are issued, deferred stock-based compensation equivalent to the fair market value on the date of grant is expensed over the vesting period. Tax benefits arising from the lapse of restrictions are recognized when realized and credited to capital in excess of stated value.

The following table summarizes activity related to restricted shares during 2016:

	Number of Shares	Weighted-Average Grant Date Fair Value Per Share
Restricted at October 31, 2015	53	$73.23
Granted	30	$70.80
Vested	(23)	$69.17
Restricted at October 31, 2016	60	$73.56

As of October 31, 2016, there was $2,115 of unrecognized compensation cost related to restricted shares. The cost is expected to be amortized over a weighted average period of 1.7 years. The amount charged to expense related to restricted shares was $1,963, $1,840 and $1,784 in 2016, 2015 and 2014, respectively. These amounts included common share dividends of $60, $51, and $52 in 2016, 2015 and 2014, respectively.

The following table summarizes activity related to restricted share units in 2016:

	Number of Units	Weighted-Average Grant Date Fair Value
Restricted share units at October 31, 2015	0	$ —
Granted	13	$72.01
Vested	(13)	$72.01
Restricted share units at October 31, 2016	0	$ —

As of October 31, 2016, there was no remaining expense to be recognized related to outstanding restricted share units. The amount charged to expense related to restricted share units during 2016, 2015 and 2014 was $974, $972 and $890, respectively.

Deferred directors' compensation — Non-employee directors may defer all or part of their cash and equity-based compensation until retirement. Cash compensation may be deferred as cash or as share equivalent units. Deferred cash amounts are recorded as liabilities, and share equivalent units are recorded as equity. Additional share equivalent units are earned when common share dividends are declared.

The following table summarizes activity related to director deferred compensation share equivalent units during 2016:

	Number of Shares	Weighted-Average Grant Date Fair Value Per Share
Outstanding at October 31, 2015	100	$36.76
Deferrals	1	$78.59
Restricted stock units vested	8	$72.09
Dividend equivalents	1	$77.95
Distributions	(11)	$26.33
Outstanding at October 31, 2016	99	$41.72

The amount charged to expense related to director deferred compensation was $158, $91 and $101 in 2016, 2015 and 2014, respectively.

Performance share incentive awards — Executive officers and selected other key employees are eligible to receive common share-based incentive awards. Payouts, in the form of unrestricted common shares, vary based on the degree to which corporate financial performance exceeds predetermined threshold, target and maximum performance levels over three-year performance periods. No payout will occur unless certain threshold performance measures are exceeded.

The amount of compensation expense is based upon current performance projections for each three-year period and the percentage of the requisite service that has been rendered. The calculations are also based upon the grant date fair value determined using the closing market price of our common shares at the grant date, reduced by the implied value of dividends not to be paid. This value was $67.69 per share for 2016, $76.48 per share for 2015 and $69.25 per share for 2014. The amounts charged to expense for executive officers and selected other key employees in 2016, 2015 and 2014 were $7,083, $3,459 and $4,304, respectively. The cumulative amount recorded in shareholders' equity at October 31, 2016, and 2015 was $10,951 and $7,561, respectively.

Deferred compensation — Our executive officers and other highly compensated employees may elect to defer up to 100 percent of their base pay and cash incentive compensation and, for executive officers, up to 90 percent of their performance share incentive award payout each year. Additional share units are credited for quarterly dividends paid on our common shares. Expense related to dividends paid under this plan was $219, $179 and $129 for 2016, 2015 and 2014, respectively.

Shares reserved for future issuance — At October 31, 2016, there were 2,664 of common shares reserved for future issuance through the exercise of outstanding options or rights.

Note 16 — Operating segments and geographic area data

We conduct business in three primary operating segments: Adhesive Dispensing Systems, Advanced Technology Systems, and Industrial Coating Systems. The composition of segments and measure of segment profitability is consistent with that used by our chief operating decision maker. The primary measure used by the chief operating decision maker for purposes of making decisions about allocating resources to the segments and assessing performance is operating profit, which equals sales less cost of sales and certain operating expenses. Items below the operating profit line of the Consolidated Statement of Income (interest and investment income, interest expense and other income/expense) are excluded from the measure of segment profitability reviewed by our chief operating decision maker and are not presented by operating segment. The accounting policies of the segments are generally the same as those described in Note 1, Significant Accounting Policies.

No single customer accounted for 10 percent or more of sales in 2016, 2015 or 2014.

The following table presents information about our reportable segments:

	Adhesive Dispensing Systems	Advanced Technology Systems	Industrial Coating Systems	Corporate	Total
Year ended October 31, 2016					
Net external sales	**$879,573**	**$ 676,329**	**$253,092**	**$ —**	**$1,808,994**
Depreciation	**15,229**	**15,386**	**3,308**	**7,320**	**41,243**
Operating profit (loss)	**229,143**[(a)]	**159,531**[(b)]	**43,511**[(c)]	**(43,754)**	**388,431**
Identifiable assets[(e)]	**751,153**	**1,080,711**	**140,169**	**465,424**[(d)]	**2,437,457**
Expenditures for long-lived assets	**17,407**	**18,967**	**17,357**	**7,120**	**60,851**
Year ended October 31, 2015					
Net external sales	$836,066	$ 593,858	$258,742	$ —	$1,688,666
Depreciation	14,804	13,015	3,194	6,694	37,707
Operating profit (loss)	195,902[(a)]	120,940[(b)]	41,458[(c)]	(40,570)	317,730
Identifiable assets[(e)]	734,145	1,021,221	130,421	486,852[(d)]	2,372,639
Expenditures for long-lived assets	12,880	36,182	5,112	7,913	62,087
Year ended October 31, 2014					
Net external sales	$899,696	$ 561,784	$242,541	$ —	$1,704,021
Depreciation	15,467	10,433	3,368	5,178	34,446
Operating profit (loss)	229,556[(a)]	140,240[(b)]	38,117[(c)]	(40,808)	367,105
Identifiable assets[(e)]	747,063	919,052	130,624	495,676[(d)]	2,292,415
Expenditures for long-lived assets	15,886	15,163	4,057	8,468	43,574

(a) Includes $7,800, $7,972 and $1,731 of severance and restructuring costs in 2016, 2015 and 2014, respectively.

(b) Includes $1,054, $3,060 and $579 of severance and restructuring costs 2016, 2015 and 2014, respectively.

(c) Includes $1,921, $379 and $241 of severance and restructuring costs in 2016, 2015 and 2014, respectively.

Notes to Consolidated Financial Statements — *(Continued)*

(d) Corporate assets are principally cash and cash equivalents, deferred income taxes, capital leases, headquarter facilities, the major portion of our enterprise management system, and intangible assets.

(e) Operating segment identifiable assets include notes and accounts receivable net of customer advance payments and allowance for doubtful accounts, inventories net of reserves, property, plant and equipment net of accumulated depreciation and goodwill.

We have significant sales and long-lived assets in the following geographic areas:

	2016	2015	2014
Net external sales			
United States	**$ 531,117**	$ 529,893	$ 503,776
Americas	**124,657**	129,325	120,993
Europe	**503,869**	462,565	494,538
Japan	**122,054**	107,797	127,057
Asia Pacific	**527,297**	459,086	457,657
Total net external sales	**$1,808,994**	$1,688,666	$1,704,021
Long-lived assets			
United States	**$ 209,959**	$ 187,212	$ 159,946
Americas	**1,730**	1,735	2,451
Europe	**23,943**	21,231	21,039
Japan	**6,408**	5,876	5,967
Asia Pacific	**31,089**	33,886	35,036
Total long-lived assets	**$ 273,129**	$ 249,940	$ 224,439

A reconciliation of total segment operating income to total consolidated income before income taxes is as follows:

	2016	2015	2014
Total profit for reportable segments	**$388,431**	$317,730	$367,105
Interest expense	**(21,322)**	(18,104)	(15,035)
Interest and investment income	**728**	558	581
Other-net	**657**	678	(138)
Income before income taxes	**$368,494**	$300,862	$352,513

A reconciliation of total assets for reportable segments to total consolidated assets is as follows:

	2016	2015	2014
Total assets for reportable segments	**$2,437,457**	$2,372,639	$2,292,415
Customer advance payments	**26,175**	22,884	25,578
Eliminations	**(41,267)**	(35,079)	(37,863)
Total consolidated assets	**$2,422,365**	$2,360,444	$2,280,130

Note 17 — Supplemental information for the statement of cash flows

	2016	2015	2014
Cash operating activities:			
Interest paid	**$ 23,423**	$ 17,312	$ 14,115
Income taxes paid	**102,592**	72,175	87,797
Non-cash investing and financing activities:			
Capitalized lease obligations incurred	**$ 5,639**	$ 5,562	$ 8,584
Capitalized lease obligations terminated	**1,033**	672	864
Shares acquired and issued through exercise of stock options	**212**	445	—

Note 18 — Quarterly financial data (unaudited)

	First	Second	Third	Fourth
2016:				
Sales	**$372,220**	**$437,592**	**$489,899**	**$509,283**
Gross margin	**196,907**	**248,405**	**273,220**	**274,967**
Net income	**41,161**	**70,601**	**84,214**	**75,867**
Earnings per share:				
Basic	**0.72**	**1.24**	**1.48**	**1.33**
Diluted	**0.72**	**1.23**	**1.46**	**1.31**
2015:				
Sales	$379,008	$400,727	$462,731	$446,200
Gross margin	208,721	221,890	248,492	234,861
Net income	42,885	49,214	69,388	49,624
Earnings per share:				
Basic	0.69	0.81	1.15	0.84
Diluted	0.69	0.80	1.14	0.84

The sum of the per-share amounts for the four quarters may not always equal the annual per-share amounts due to differences in the average number of shares outstanding during the respective periods.

During the fourth quarter of 2016, we recorded pre-tax severance and restructuring costs of $6,411.

During the third quarter of 2016, we recorded pre-tax severance and restructuring costs of $1,714 and we recorded other expense of $2,722 related to the reversal of an indemnification asset resulting from the effective settlement of a tax exam. Additionally, our income tax provision for the third quarter included a discrete tax benefit of $1,651 related to the effective settlement of a tax exam.

During the second quarter of 2016, we recorded pre-tax severance and restructuring costs of $1,633. Additionally, we recorded other income of $800 related to a favorable litigation settlement and a $1,192 favorable adjustment to unrecognized tax benefits related to the effective settlement of a tax exam. Furthermore, our income tax provision for the second quarter included a discrete tax benefit of $1,136 related to the effective settlement of a tax exam.

During the first quarter of 2016, we recorded pre-tax severance and restructuring costs of $1,017.

On December 18, 2015, the Protecting Americans from Tax Hikes Act of 2015 was enacted which retroactively reinstated the Federal Research and Development Tax Credit (Federal R&D Tax Credit) as of January 1, 2015, and made it permanent. As a result, our income tax provision for the three months ended January 31, 2016 includes a discrete tax benefit of $2,025 primarily related to 2015. Additionally, our income tax provision for the first quarter included a discrete tax benefit of $6,184 related to dividends paid from previously taxed foreign earnings.

During the fourth quarter of 2015, we recorded pre-tax severance and restructuring costs of $9,092. Additionally, we recorded other income of $1,608 related to a favorable litigation settlement.

During the third quarter of 2015, we recorded pre-tax severance and restructuring costs of $2,319.

During the first quarter of 2015, we recorded a pre-tax loss of $1,572 related to a pension settlement.

On December 19, 2014, the Tax Increase Prevention Act of 2014 was enacted which retroactively reinstated the Federal R&D Tax Credit from January 1, 2014 to December 31, 2014 and extended certain other tax provisions. As a result, our income tax provision for the first quarter of 2015 included a discrete tax benefit of $1,786 primarily related to 2014.

Note 19 — Contingencies

We are involved in pending or potential litigation regarding environmental, product liability, patent, contract, employee and other matters arising from the normal course of business. Including the environmental matter discussed below, after consultation with legal counsel, we believe that the probability is remote that losses in excess of the amounts we have accrued would have a material adverse effect on our financial condition, quarterly or annual operating results or cash flows.

Environmental — We have voluntarily agreed with the City of New Richmond, Wisconsin and other Potentially Responsible Parties to share costs associated with the remediation of the City of New Richmond municipal landfill (the "Site") and constructing a potable water delivery system serving the impacted area down gradient of the Site. At October 31, 2016, and 2015 our accrual for the ongoing operation, maintenance and monitoring obligation at the Site was $516 and $565, respectively. The liability for environmental remediation represents management's best estimate of the probable and reasonably estimable undiscounted costs related to known remediation obligations. The accuracy of our estimate of environmental liability is affected by several uncertainties such as additional requirements that may be identified in connection with remedial activities, the complexity and evolution of environmental laws and regulations, and the identification of presently unknown remediation requirements. Consequently, our liability could be different than our current estimate. However, we do not expect that the costs associated with remediation will have a material adverse effect on our financial condition or results of operations.

Management's Report on Internal Control Over Financial Reporting

The management of Nordson Corporation is responsible for establishing and maintaining adequate internal control over financial reporting.

Using criteria set forth by the Committee of Sponsoring Organizations of the Treadway Commission (COSO) in Internal Control-Integrated Framework (2013 framework), Nordson's management assessed the effectiveness of our internal control over financial reporting as of October 31, 2016.

We acquired LinkTech Quick Couplings, Inc. on September 1, 2016. It represented less than two percent of our total assets as of October 31, 2016. As the acquisition occurred during the last 12 months, the scope of our assessment of the effectiveness of internal control over financial reporting does not include LinkTech. This exclusion is in accordance with the SEC's general guidance that assessments of recently acquired businesses may be omitted from our scope in the year of acquisition.

Based on our assessment, management concluded that our internal control over financial reporting was effective as of October 31, 2016.

The independent registered public accounting firm, Ernst & Young LLP, has also audited the effectiveness of our internal control over financial reporting as of October 31, 2016. Their report is included herein.

/s/ MICHAEL F. HILTON	/s/ GREGORY A. THAXTON
President and Chief Executive Officer	Senior Vice President, Chief Financial Officer
December 15, 2016	December 15, 2016

Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders of Nordson Corporation

We have audited Nordson Corporation's internal control over financial reporting as of October 31, 2016, based on criteria established in Internal Control — Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) (the COSO criteria). Nordson Corporation's management is responsible for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting included in the accompanying Management's Report on Internal Control Over Financial Reporting. Our responsibility is to express an opinion on the company's internal control over financial reporting based on our audit.

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

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

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

As indicated in the accompanying Management's Report on Internal Control Over Financial Reporting, management's assessment of and conclusion on the effectiveness of internal control over financial reporting did not include the internal controls of LinkTech Quick Couplings, Inc. which is included in the 2016 consolidated financial statements of Nordson Corporation and constituted less than two percent of total assets as of October 31, 2016. Our audit of internal control over financial reporting of Nordson Corporation also did not include an evaluation of the internal control over financial reporting of LinkTech Quick Couplings, Inc.

In our opinion, Nordson Corporation maintained, in all material respects, effective internal control over financial reporting as of October 31, 2016, based on the COSO criteria.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), the consolidated balance sheets of Nordson Corporation as of October 31, 2016 and 2015, and the related consolidated statements of income, comprehensive income, shareholders' equity, and cash flows for each of the three years in the period ended October 31, 2016 of Nordson Corporation and our report dated December 15, 2016 expressed an unqualified opinion thereon.

Ernst + Young LLP

Cleveland, Ohio
December 15, 2016

Report of Independent Registered Public Accounting Firm

The Board of Directors and Shareholders of Nordson Corporation

We have audited the accompanying consolidated balance sheets of Nordson Corporation as of October 31, 2016 and 2015 and the related consolidated statements of income, comprehensive income, shareholders' equity, and cash flows for each of the three years in the period ended October 31, 2016. Our audits also included the financial statement schedule listed in the Index at Item 15(a). These financial statements and schedule are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements and schedule based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the consolidated financial position of Nordson Corporation at October 31, 2016 and 2015, and the consolidated results of its operations and its cash flows for each of the three years in the period ended October 31, 2016, in conformity with U.S. generally accepted accounting principles. Also, in our opinion, the related financial statement schedule, when considered in relation to the basic financial statements taken as a whole, presents fairly in all material respects the information set forth therein.

We also have audited, in accordance with the standards of the Public Company Accounting Oversight Board (United States), Nordson Corporation's internal control over financial reporting as of October 31, 2016, based on criteria established in Internal Control-Integrated Framework issued by the Committee of Sponsoring Organizations of the Treadway Commission (2013 framework) and our report dated December 15, 2016 expressed an unqualified opinion thereon.

Ernst + Young LLP

Cleveland, Ohio
December 15, 2016

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

None.

Item 9A. Controls and Procedures

(a) Evaluation of disclosure controls and procedures. Our management, with the participation of the principal executive officer (president and chief executive officer) and the principal financial officer (senior vice president and chief financial officer), has reviewed and evaluated our disclosure controls and procedures (as defined in the Securities Exchange Act Rule 13a-15e) as of October 31, 2016. Based on that evaluation, our management, including the principal executive and financial officers, has concluded that our disclosure controls and procedures were effective as of October 31, 2016 in ensuring that information required to be disclosed in the reports that we file or submit under the Securities Exchange Act of 1934 is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms and is accumulated and communicated to our management, including the principal executive officer and the principal financial officer, as appropriate to allow timely decisions regarding required disclosure.

(b) Management's report on internal control over financial reporting. The Report of Management on Internal Control over Financial Reporting and the Report of Independent Registered Public Accounting Firm thereon are set forth in Part II, Item 8 of this Annual Report on Form 10-K.

(c) Changes in internal control over reporting. There were no changes in our internal controls over financial reporting that occurred during the fourth quarter of 2016 that have materially affected, or are reasonably likely to materially affect, our internal control over financial reporting.

Item 9B. Other Information

None.

PART III

Item 10. Directors, Executive Officers and Corporate Governance

The information required by this Item is incorporated by reference to the captions "Election of Directors Whose Terms Expire in 2020" and "Section 16(a) Beneficial Ownership Reporting Compliance" of our definitive Proxy Statement for the 2017 Annual Meeting of Shareholders. Information regarding Audit Committee financial experts is incorporated by reference to the caption "Election of Directors Whose Terms Expire in 2020" of our definitive Proxy Statement for the 2017 Annual Meeting of Shareholders.

Our executive officers serve for a term of one year from date of election to the next organizational meeting of the board of directors and until their respective successors are elected and qualified, except in the case of death, resignation or removal. Information concerning executive officers is contained in Part I of this report under the caption "Executive Officers of the Company."

We have adopted a code of ethics for all employees and directors, including the principal executive officer, other executive officers, principal finance officer and other finance personnel. A copy of the code of ethics is available free of charge on our Web site at http://www.nordson.com/en/our-company/corporate-governance. We intend to satisfy our disclosure requirement under Item 5.05 of Form 8-K regarding any amendment to or waiver of a provision of our code of ethics that applies to our principal executive officer, principal financial officer, principal accounting officer or controller or persons performing similar functions and that relates to any element of the code of ethics definition enumerated in Item 406(b) of Regulation S-K by posting such information on our Web site.

Item 11. Executive Compensation

The information required by this Item is incorporated by reference to the "Executive Compensation Discussion and Analysis" section of the definitive Proxy Statement for the 2017 Annual Meeting of Shareholders, along with the sections captioned "Directors Compensation," "Summary Compensation Table," "Grants of Plan-Based Awards," "Outstanding Equity Awards at October 31, 2016," "Option Exercises and Stock Vested Tables," "Pension Benefits Table," "Nonqualified Deferred Compensation" and "Potential Benefits Upon Termination" in our definitive Proxy Statement for the 2017 Annual Meeting of Shareholders.

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

The information required by this Item is incorporated by reference to the caption "Security Ownership of Nordson Common Shares by Directors, Executive Officers and Large Beneficial Owners" in our definitive Proxy Statement for the 2017 Annual Meeting of Shareholders.

Equity Compensation Table

The following table sets forth information regarding equity compensation plans in effect as of October 31, 2016:

Plan category	Number of securities to be issued upon exercise of outstanding options, warrants and rights	Weighted-average exercise price of outstanding options, warrants and rights	Number of securities remaining available for future issuance under equity compensation plans (excluding securities reflected in first reporting column)
Equity compensation plans approved by security holders	1,881	$58.41	2,900
Equity compensation plans not approved by security holders	—	—	—
Total	1,881	$58.41	2,900

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

The information required by this Item is incorporated by reference to the caption "Review of Transactions with Related Persons" in our definitive Proxy Statement for the 2017 Annual Meeting of Shareholders.

Item 14. Principal Accountant Fees and Services

The information required by this Item is incorporated by reference to the caption "Fees Paid to Ernst & Young LLP" in our definitive Proxy Statement for the 2017 Annual Meeting of Shareholders.

PART IV

Item 15. Exhibits and Financial Statement Schedule

The following are filed as part of this report:

(a) 1. Financial Statements
The following financial statements are included in Part II, Item 8:

Consolidated Statements of Income for each of the three years in the period ended October 31, 2016

Consolidated Statements of Comprehensive Income for each of the three years in the period ended October 31, 2016

Consolidated Balance Sheets as of October 31, 2016 and October 31, 2015

Consolidated Statements of Shareholders' Equity for each of the three years in the period ended October 31, 2016

Consolidated Statements of Cash Flows for each of the three years in the period ended October 31, 2016

Notes to Consolidated Financial Statements

Reports of Independent Registered Public Accounting Firm

(a) 2. Financial Statement Schedule
Schedule II Valuation and Qualifying Accounts and Reserves for each of the three years in the period ending October 31, 2016.

No other consolidated financial statement schedules are presented because the schedules are not required, because the required information is not present or not present in amounts sufficient to require submission of the schedule, or because the information required is included in the financial statements, including the notes thereto.

(a) 3. Exhibits
The exhibits listed on the accompanying index to exhibits are filed as part of this Annual Report on Form 10-K.

Signatures

Pursuant to the requirements of Section 13 or 15(d) 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.

NORDSON CORPORATION

Date: December 15, 2016

By: /s/ GREGORY A. THAXTON

Gregory A. Thaxton
Senior Vice President, Chief Financial Officer

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS, that each person whose signature appears below hereby constitutes and appoints Gregory A. Thaxton as his or her true and lawful attorney-in-fact and agent with full power to act alone, for him or her and in his or her name, place and stead, in any and all capacities, to sign any and all amendments to this Annual Report on Form 10-K, and to file the same, with all exhibits thereto, and all other documents in connection therewith, with the Securities and Exchange Commission, granting unto said attorney-in-fact and agent full power and authority to do and perform each and every act and thing requisite and necessary to be done in and about the premises, as fully to all intents and purposes as he might or could do in person, hereby ratifying and confirming all that said attorney-in-fact and agent, may lawfully do or cause to be done by virtue hereof.

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

Signatures	Title	Date
/s/ MICHAEL F. HILTON Michael F. Hilton	Director, President and Chief Executive Officer (Principal Executive Officer)	December 15, 2016
/s/ GREGORY A. THAXTON Gregory A. Thaxton	Senior Vice President, Chief Financial Officer (Principal Financial Officer) (Principal Accounting Officer)	December 15, 2016
/s/ JOSEPH P. KEITHLEY Joseph P. Keithley	Chairman of the Board	December 15, 2016
/s/ LEE C. BANKS Lee C. Banks	Director	December 15, 2016
/s/ RANDOLPH W. CARSON Randolph W. Carson	Director	December 15, 2016
/s/ ARTHUR L. GEORGE, JR. Arthur L. George, Jr.	Director	December 15, 2016
/s/ FRANK M. JAEHNERT Frank M. Jaehnert	Director	December 15, 2016
/s/ MICHAEL J. MERRIMAN, JR. Michael J. Merriman, Jr.	Director	December 15, 2016
/s/ MARY G. PUMA Mary G. Puma	Director	December 15, 2016
/s/ VICTOR L. RICHEY, JR. Victor L. Richey, Jr.	Director	December 15, 2016

Schedule II — Valuation and Qualifying Accounts and Reserves

	Balance at Beginning of Year	Assumed from Acquisitions	Charged to Expense	Deductions	Currency Effects	Balance at End of Year
Allowance for Doubtful Accounts						
2014	$ 4,265	121	867	551	(215)	$ 4,487
2015	$ 4,487	178	1,014	773	(404)	$ 4,502
2016	**$ 4,502**	**10**	**1,867**	**945**	**101**	**$ 5,535**
Inventory Obsolescence and Other Reserves						
2014	$26,579	1,045	6,706	6,361	(1,225)	$26,744
2015	$26,744	333	9,154	6,741	(1,260)	$28,230
2016	**$28,230**	**35**	**6,684**	**6,096**	**471**	**$29,324**

NORDSON CORPORATION

Index to Exhibits

(Item 15(a) (3))

Exhibit Number	Description
(3)	Articles of Incorporation and By-Laws
3-a	1989 Amended Articles of Incorporation (incorporated herein by reference to Exhibit 3-a to Registrant's Annual Report on Form 10-K for the year ended October 31, 2011)
3-a-1	Certificate of Amendment to 1989 Amended Articles of Incorporation (incorporated herein by reference to Exhibit 3-a-1 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2011)
3-b	1998 Amended Regulations
(4)	Instruments Defining the Rights of Security Holders, including indentures
4-b	Amended and Restated Note Purchase and Private Shelf Agreement for $200 million between Nordson Corporation and New York Life Investment Management LLC dated as of September 30, 2016
4-c	$500 million Credit Agreement dated December 9, 2011 between Nordson Corporation and various financial institutions (incorporated herein by reference to Exhibit 4.1 to Registrant's Form 8-K dated December 12, 2011)
4-e	Master Note Purchase Agreement dated July 26, 2012 between Nordson Corporation and the purchasers listed therein (incorporated herein by reference to Exhibit 4.2 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2012)
4-g	Credit Agreement dated August 6, 2014 by and among Nordson Corporation, PNC Bank National Association and PNC Capital Markets LLC (incorporated herein by reference to Exhibit 10.3 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2014)
4-h	Second Amended and Restated Credit Agreement dated February 20, 2015 between Nordson Corporation and various financial institutions (incorporated herein by reference to Exhibit 4.1 to Registrant's Form 8-K dated February 26, 2015)
4-i	$200 million Term Loan Facility Agreement dated April 10, 2015 between Nordson Corporation and PNC Bank National Association (incorporated herein by reference to Exhibit 4.2 to Registrant's Quarterly Report on Form 10-Q for the quarter ended April 30, 2015)
4-j	Master Note Purchase Agreement dated July 28, 2015 between Nordson Corporation and the purchasers listed therein (incorporated herein by reference to Exhibit 4.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2015)
(10)	Material Contracts
10-b-1	Nordson Corporation 2005 Deferred Compensation Plan*
10-b-2	Nordson Corporation 2005 Deferred Compensation Plan (as Amended and Restated Effective January 1, 2009) (incorporated herein by reference to Exhibit 10-b-2 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2014)*
10-b-3	First amendment to the Nordson Corporation 2005 Deferred Compensation Plan (incorporated herein by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended April 30, 2016).

Index to Exhibits — *(Continued)*

Exhibit Number	Description
10-c	Resolution of Board of Directors Authorizing Execution of Indemnification Agreements (incorporated herein by reference to Exhibit 10-c to Registrant's Annual Report on Form 10-K for the year ended October 31, 2013)*
10-c-1	Form of Indemnity Agreement between the Registrant and Directors, effective November 1, 2016*
10-c-2	Form of Indemnity Agreement between the Registrant and Executive Officers, effective November 1, 2016*
10-d-1	First Amendment to Nordson Corporation Excess Defined Contribution Retirement Plan (incorporated herein by reference to Exhibit 10-d-1 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2012)*
10-d-2	Nordson Corporation 2005 Excess Defined Contribution Benefit Plan (incorporated herein by reference to Exhibit 10-d-2 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2011)*
10-d-3	Nordson Corporation 2005 Excess Defined Contribution Retirement Plan (as Amended and Restated Effective January 1, 2009) (incorporated herein by reference to Exhibit 10-d-3 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2014)*
10-e-1	Second Amendment to Nordson Corporation Excess Defined Benefit Pension Plan (incorporated herein by reference to Exhibit 10-e-1 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2012)*
10-e-2	Nordson Corporation 2005 Excess Defined Benefit Pension Plan*
10-e-3	Nordson Corporation 2005 Excess Defined Benefit Pension Plan (as Amended and Restated Effective January 1, 2009) (incorporated herein by reference to Exhibit 10-e-3 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2014)*
10-g-1	Amended and Restated Nordson Corporation 2004 Long-Term Performance Plan (incorporated herein by reference to Exhibit 10-g-1 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2013)*
10-g-2	Nordson Corporation 2012 Stock Incentive and Award Plan (incorporated by reference to Exhibit 10.1 to Registrant's Form 8-K dated March 4, 2013)*
10-g-3	Nordson Corporation 2012 Stock Incentive and Award Plan, Form of Notice of Award — Key Employees (as amended November 24, 2014) (incorporated herein by reference to Exhibit 10-g-3 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2014)*
10-g-4	Nordson Corporation 2012 Stock Incentive and Award Plan, Form of Notice of Award —Executive Officers (as amended November 24, 2014) (incorporated herein by reference to Exhibit 10-g-4 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2014)*
10-g-5	Nordson Corporation 2012 Stock Incentive and Award Plan, Directors' Deferred Compensation Sub-Plan (incorporated herein by reference to Exhibit 10-g -5 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2013)*
10-g-6	Nordson Corporation 2012 Stock Incentive and Award Plan, Directors' Deferred Compensation Sub-Plan, Form of Notice of Award (incorporated herein by reference to Exhibit 10-g-6 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2013)*
10-h	Assurance Trust Agreement between Nordson Corporation and Key Trust Company of Ohio, N.A. amended and restated as of January 22, 2014 (incorporated herein by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended January 31, 2014)
10-h-1	Form of Change in Control Retention Agreement between the Registrant and Executive Officers (incorporated herein by reference to Exhibit 10-h-1 to Registrant's Annual Report on Form 10-K for the year ended October 31, 2014)*
10-i	Compensation Committee Rules of the Nordson Corporation 2004 Long Term Performance Plan governing directors' deferred compensation*

Index to Exhibits — *(Continued)*

Exhibit Number	Description
10-j	Compensation Committee Rules of the Nordson Corporation Amended and Restated Nordson Corporation 2004 Long Term Performance Plan governing directors' deferred compensation*
10-m	Employment Agreement between Registrant and Michael F. Hilton (incorporated herein by reference to Exhibit 10-m to Registrant's Annual Report on Form 10-K for the year ended October 31, 2015)*
10-n	Employment Agreement (Change in Control Retention Agreement) between Registrant and Michael F. Hilton (incorporated herein by reference to Exhibit 10-n to Registrant's Annual Report on Form 10-K for the year ended October 31, 2015)*
10-o	Supplemental Retirement Agreement between the Registrant and Michael F. Hilton*
10-p	Stock Purchase Agreement by and among VP Acquisition Holdings, Inc., the Stockholders of VP Acquisition Holdings, Inc., the Optionholders of VP Acquisition Holdings, Inc., American Capital, Ltd., as Securityholder Representative, and Nordson Corporation dated as of July 15, 2011
10-q	Stock Purchase Agreement dated May 18, 2012 by and among Nordson Corporation and Bertram Growth Capital I, Bertram Growth Capital II, Bertram Growth Capital II-A, and EDI Holdings, Inc. (incorporated herein by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2012)
10-r	Agreement and Plan of Merger by and among Xaloy Superior Holdings, Inc., Nordson Corporation, Buckeye Merger Corp. and Sellers' Representative dated as of June 2, 2012 (incorporated herein by reference to Exhibit 10.2 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2012)
10-s	Sale and Purchase Agreement dated July 16, 2013 relating to Kreyenborg and BKG between Mr. Jan-Udo Kreyenborg, Kreyenborg Verwaltungen und Beteiligungen GmbH & Co. KG, Kreyenborg Verwaltungs-GmbH and Nordson Corporation (incorporated herein by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2013)
10-t	Agreement and Primary Release of Claims dated June 24, 2014 between Registrant and Peter G. Lambert (incorporated herein by reference to Exhibit 10.1 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2014)
10-u	Agreement and Plan of Merger by and among Avalon Laboratories Holding Corp., Nordson Medical Corporation, Arriba Merger Corp., American Capital Equity III, LP, as Securityholders' Representative and for the limited purposes set forth herein, Nordson Corporation, dated as of August 1, 2014 (incorporated herein by reference to Exhibit 10.2 to Registrant's Quarterly Report on Form 10-Q for the quarter ended July 31, 2014)
(21)	Subsidiaries of the Registrant
(23)	Consent of Independent Registered Public Accounting Firm
31.1	Certification pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934 by the Chief Executive Officer, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
31.2	Certification pursuant to Rule 13a-14(a)/15d-14(a) of the Securities Exchange Act of 1934 by the Chief Financial Officer, as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002
32.1	Certification of CEO pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
32.2	Certification of CFO pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002
99-a	Form S-8 Undertakings (Nos. 33-18309 and 33-33481)

Index to Exhibits — *(Continued)*

Exhibit Number	Description
101	The following financial information from Nordson Corporation's Annual Report on Form 10-K for the year ended October 31, 2016, formatted in Extensible Business Reporting Language (XBRL): (i) the Consolidated Statements of Income for the years ended October 31, 2016, 2015 and 2014, (ii) the Consolidated Statements of Comprehensive Income for the years ended October 31, 2016, 2015 and 2014 (iii) the Consolidated Balance Sheets at October 31, 2016 and 2015, (iv) the Consolidated Statements of Changes in Shareholders' Equity for the years ended October 31, 2016, 2015 and 2014, (v) the Consolidated Statements of Cash Flows for the years ended October 31, 2016, 2015 and 2014, and (vi) Notes to Consolidated Financial Statements.

* Indicates management contract or compensatory plan, contract or arrangement in which one or more directors and/or executive officers of Nordson Corporation may be participants.

Exhibit 21

NORDSON CORPORATION
Subsidiaries of the Registrant

The following table sets forth the subsidiaries of the Registrant (each of which is included in the Registrant's consolidated financial statements), and the jurisdiction under the laws of which each subsidiary was organized:

Name	Jurisdiction of Incorporation
UNITED STATES:	
Nordson ASYMTEK, Inc.	California
Nordson MARCH, Inc.	California
Nordson DAGE, Inc.	California
Matrix-FocalSpot, Inc.	California
Nordson YESTECH, Inc.	California
LinkTech Quick Couplings, Inc.	California
Value Plastics, Inc.	Colorado
VP Acquisition Holding, Inc.	Delaware
Xaloy Holdings, Inc.	Delaware
Nordson Xaloy Incorporated	Delaware
Xaloy Extrusion LLC dba Nordson Xaloy Incorporated	Delaware
Nordson Extrusion Dies Industries, LLC	Delaware
Flametech Corporation	Delaware
New Castle Screws, Inc.	Delaware
Xaloy Superior Holdings, Inc.	Delaware
Avalon Laboratories Holding Corp.	Delaware
Avalon Laboratories, LLC	Delaware
J and M Laboratories, Inc.	Georgia
Micromedics, Inc.	Minnesota
Nordson U.S. Trading Company	Ohio
Nordson England L.L.C.	Ohio
Nordson Medical Corporation	Ohio
Spirex Corporation dba Nordson Xaloy Incorporated	Ohio
Nordson Pacific, Inc.	Ohio
Nordson Advanced Technology LLC	Ohio
Nordson Atlantic LLC	Ohio
Realty Land Conservancy III LLC	Ohio
Nordson Xaloy Incorporated	Ohio
New Castle Industries, Inc. dba Nordson Xaloy Incorporated	Pennsylvania
Atlantic Grinding & Welding, Inc.	Pennsylvania
F.R. Gross Co., Inc.	Pennsylvania
Nordson EFD LLC	Rhode Island
EFD International, Inc.	Rhode Island
New Castle Rolls, Inc.	Virginia
EDI Holdings, Inc.	Wisconsin

Name	Jurisdiction of Incorporation
INTERNATIONAL:	
Nordson Australia Pty. Limited	Australia
Nordson Pacific, Inc. Australian Representative Office	Australia
Nordson Osterreich GmbH	Austria
Nordson Benelux S.A./N.V.	Belgium
Nordson EDI Europe NV	Belgium
Nordson do Brasil Industria e Comercio Ltda.	Brazil
Nordson Canada Limited	Canada
Nordson (China) Co., Ltd.	China
Dage Test Systems (Suzhou) Co. Ltd.	China
Suzhou Nordson Electronics Equipment., Co., Ltd. fka Dage Trading (Suzhou) Co. Ltd.	China
Nordson PPS (Shanghai) Co. Ltd. fka Nordson Extrusion Dies Industries (Shanghai) Co. Ltd.	China
Nordson China Business Trust	China
Matrix (Suzhou) Trading Co., Ltd.	China
Nordson (Shanghai) Business Consulting Co., Ltd.	China
Nordson Andina Limitada	Colombia
PDMC Branch Company of Nordson (China) Ltd.	China
Nordson CS, spol.s.r.o.	Czech Republic
Nordson Danmark A/S	Denmark
Nordson Finland Oy	Finland
Nordson France S.A.S.	France
Dosage 2000 S.A.R.L	France
Nordson Deutschland GmbH	Germany
Nordson Engineering GmbH	Germany
Dage Deutschland GmbH	Germany
Nordson Holdings S.a.r.l. & Co. KG	Germany
Nordson Xaloy Europe GmbH	Germany
EDI GmbH	Germany
Nordson PPS GmbH fka Nordson Kreyenborg GmbH	Germany
Nordson BKG GmbH	Germany
Nordson Germania Ltd. & Co. KG	Germany
Liquidyn GmbH	Germany
Matrix Technologies GmbH	Germany
WAFO Schnecken und Zylinder GmbH	Germany
Nordson Asia Pacific, Ltd.	Hong Kong
Value Plastics (Asia Pacific)	Hong Kong
Ligonia Limited	Hong Kong

Name	Jurisdiction of Incorporation
INTERNATIONAL:	
Macaria Limited	Hong Kong
Nordson Advanced Technology (Hong Kong) Ltd.	Hong Kong
Nordson India Private Limited	India
Nordson S.E. Asia (Pte.) Limited, Indonesia Representative Office	Indonesia
Nordson Italia S.p.A.	Italy
Nordson Xaloy Italia S.r.l.	Italy
Nordson K.K.	Japan
Nordson Advanced Technology (Japan) K.K. fka Dage Japan Co., Ltd.	Japan
Nordson Xaloy K.K.	Japan
Nordson European Holdings Luxembourg S.a.r.l.	Luxembourg
Nordson S.a.r.l.	Luxembourg
Nordson Luxembourg S.a.r.l.	Luxembourg
Nordson (Malaysia) Sdn. Bhd.	Malaysia
Nordson de Mexico, S.A. de C.V.	Mexico
Nordson Benelux B.V.	The Netherlands
Nordson B.V.	The Netherlands
Nordson Dima B.V. fka Dima Group B.V.	The Netherlands
C-Tech Systems B.V.	The Netherlands
Nordson New Zealand	New Zealand
Nordson Norge A/S	Norway
Nordson Polska Sp.z.o.o.	Poland
Nordson Portugal Equipamento Industrial, Lda.	Portugal
Nordson Russia Limited Liability Company	Russia
Nordson S.E. Asia (Pte.) Ltd.	Singapore
Nordson Advanced Technology (Singapore) Pte. Ltd. fka Dage (SEASIA) Pte. Ltd	Singapore
Nordson Advanced Technology International Pte. Ltd.	Singapore
Matrix Inspection Systems, Pte. Ltd.	Singapore
Nordson SA (Pty) Limited	South Africa
Nordson Korea	South Korea
Nordson Iberica, S.A.	Spain
Nordson AB	Sweden
Nordson (Schweiz) A.G.	Switzerland
Nordson Advanced Technology LLC (Taiwan Branch)	Taiwan
Nordson Xaloy Asia (Thailand) Ltd.	Thailand
Nordson (U.K.) Limited	United Kingdom
Dage Holdings Limited	United Kingdom
Dage Pension Trustees Limited	United Kingdom

Name	Jurisdiction of Incorporation
INTERNATIONAL:	
Dage Precision Industries Limited	United Kingdom
YDX Limited 2010 fka Nordson London Limited	United Kingdom
Primount LLP	United Kingdom
Majority Kingdom Investment Limited	United Kingdom
Minority Kingdom Investment Limited	United Kingdom
Nordson International de Venezuela, CA	Venezuela
Representative Office of Nordson S.E. Asia (Pte.) Limited in Ho Chi Minh City	Vietnam

EXHIBIT 23
NORDSON CORPORATION
Consent of Independent Registered Public Accounting Firm

We consent to the incorporation by reference in the following Registration Statements:

1. Registration Statement (Form S-8 No. 333-167406) pertaining to the Nordson Employees' Savings Trust Plan and Nordson Hourly-Rated Employees' Savings Trust Plan;
2. Registration Statement (Form S-8 No. 33-18309) pertaining to the Nordson Employees' Savings Trust Plan;
3. Registration Statement (Form S-8 No. 33-33481) pertaining to the Nordson Hourly-Rated Employees' Savings Trust Plan;
4. Registration Statement (Form S-8 No. 333-119399) pertaining to the Nordson Corporation 2004 Long-Term Performance Plan; and
5. Registration Statement (Form S-8 No. 333-188980) pertaining to the Nordson Corporation 2012 Stock Incentive and Award Plan

of our reports dated December 15, 2016, with respect to the consolidated financial statements and schedule of Nordson Corporation and the effectiveness of internal control over financial reporting of Nordson Corporation included in this Annual Report (Form 10-K) of Nordson Corporation for the year ended October 31, 2016.

Ernst & Young LLP

Cleveland, Ohio
December 15, 2016

Certifications
Exhibit 31.1
CERTIFICATION PURSUANT TO RULE 13a-14(a)/15d-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Michael F. Hilton, certify that:

1. I have reviewed this Annual Report on Form 10-K of Nordson Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting that are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: December 15, 2016

/s/ MICHAEL F. HILTON

Michael F. Hilton
President and Chief Executive Officer

Exhibit 31.2

CERTIFICATION PURSUANT TO RULE 13a-14(a)/15d-14(a) OF THE SECURITIES EXCHANGE ACT OF 1934, AS ADOPTED PURSUANT TO SECTION 302 OF THE SARBANES-OXLEY ACT OF 2002

I, Gregory A. Thaxton, certify that:

1. I have reviewed this Annual Report on Form 10-K of Nordson Corporation;

2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;

3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;

4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

a) designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

b) designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

c) evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

d) disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth fiscal quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and

5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of registrant's board of directors (or persons performing the equivalent functions):

a) all significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting that are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

b) any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: December 15, 2016

/s/ GREGORY A. THAXTON

Gregory A. Thaxton
Senior Vice President, Chief Financial Officer

Exhibit 32.1
CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Nordson Corporation (the "Company") on Form 10-K for the year ended October 31, 2016, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Michael F. Hilton, president and chief executive officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

December 15, 2016

/s/ MICHAEL F. HILTON

Michael F. Hilton
President and Chief Executive Officer

Exhibit 32.2

CERTIFICATION PURSUANT TO
18 U.S.C. SECTION 1350,
AS ADOPTED PURSUANT TO
SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of Nordson Corporation (the "Company") on Form 10-K for the year ended October 31, 2016, as filed with the Securities and Exchange Commission on the date hereof (the "Report"), I, Gregory A. Thaxton, senior vice president, chief financial officer of the Company, certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

(1) The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and

(2) The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of the Company.

December 15, 2016

/s/ GREGORY A. THAXTON

Gregory A. Thaxton
Senior Vice President, Chief Financial Officer

EXECUTIVE OFFICERS

Michael F. Hilton

President and
Chief Executive Officer

Gregory A. Thaxton

Senior Vice President,
Chief Financial Officer

James E. DeVries

Vice President, Global
Continuous Improvement

Shelly M. Peet

Vice President,
Human Resources

Robert E. Veillette

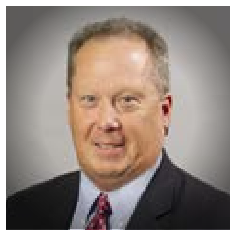
Vice President,
General Counsel and Secretary

John J. Keane

Senior Vice President,
Operations

Gregory P. Merk

Senior Vice President,
Operations



Douglas C. Bloomfield

Vice President,
Operations

Jeffrey A. Pembroke

Vice President,
Operations

Joseph Stockunas

Vice President,
Operations

BOARD OF DIRECTORS

Chairman

Joseph P. Keithley

Retired Chairman,
President and Chief
Executive Officer,
Keithley Instruments, Inc.
Committees: 2, 3 Chair, 4

Lee C. Banks

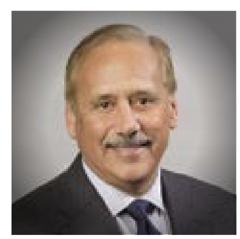
President and
Chief Operating Officer,
Parker Hannifin Corporation
Committee: 2

Randolph W. Carson

Retired Executive Officer,
Eaton Corporation
Committees: 1, 4

Arthur L. George, Jr.

Retired Senior Vice President,
Texas Instruments Inc.
Committee: 1



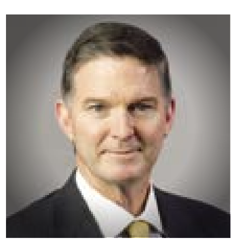
Michael F. Hilton

President and
Chief Executive Officer
Committee: 3

1 Audit Committee
2 Compensation Committee
3 Executive Committee
4 Governance and Nominating Committee

Frank M. Jaehnert

Retired President and
Chief Executive Officer,
Brady Corporation
Committee: 1



Michael J. Merriman, Jr.

Operating Advisor,
Resilience Capital
Partners LLC
Committees: 1 Chair, 3

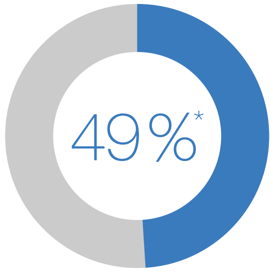
Mary G. Puma

President and
Chief Executive Officer,
Axcelis Technologies, Inc.
Committees: 2 Chair, 3, 4

Victor L. Richey, Jr.

Chairman, President and
Chief Executive Officer,
ESCO Technologies, Inc.
Committees: 2, 4 Chair

Adhesive Dispensing Systems



* Of FY16 Nordson Sales

Advanced Technology Systems

PRODUCT LINES

Packaging Systems

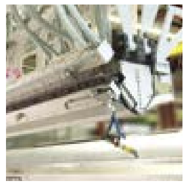
Automated adhesive dispensing equipment used in paper based packaging for food, beverage, pharmaceutical and related industries.

Nonwoven Systems

Dispensing, coating and laminating systems for applying adhesives, lotions, liquids and fibers to disposable hygiene products and continuous roll goods.

Product Assembly

Dispensing, coating and laminating systems for the assembly of plastic, metal and wood products, for paper and paperboard converting applications, and for the manufacturing of continuous roll goods.



Polymer Processing Systems

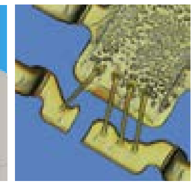
Precision components for plastic extrusion, injection molding, recycling, compounding and polymerization processes in a wide range of applications.

Nordson ASYMTEK

Automated dispensing systems for high-speed, accurate application of a broad range of attachment, protection and coating fluids.

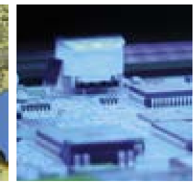
Nordson MARCH

Automated gas plasma treatment systems used to clean and condition surfaces for the semiconductor, medical and printed circuit board industries.



Nordson DAGE

Bond testing and x-ray inspection systems for yield enhancement in electronic assembly industries.



Nordson YESTECH

Automated optical inspection systems for yield enhancement in electronic assembly industries.

KEY APPLICATIONS & MARKETS

- Beverage straw and spout attachment
- Convenience food packaging
- Corrugated box sealing
- Case and sift-proof sealing
- Container and bottle labeling
- Pallet stabilization
- Tamper evident closure

- Adult incontinence products
- Baby diapers and child training pants
- Medical products, surgical drapes and gowns
- Feminine hygiene products
- Tissues and towels

- Appliances
- Building and construction
- Electronics
- Furniture
- Solar energy
- Vehicle components
- Windows and doors
- Bags, sacks, envelopes, folding cartons
- Bookbinding

- Building products
- Consumer goods
- Flexible packaging
- Medical
- Transportation and aerospace
- Plastic compounding and recycling

- Mobile phones, tablets, flat panel displays, LEDs and electronic components
- Medical devices
- PCs, netbooks and notebooks
- Printed circuit boards and semiconductor packaging
- Energy

- Electronics
- Hard disk drives
- Printed circuit boards
- Semiconductors
- Medical instruments
- Wafer level packaging

- Printed circuit board assemblies
- Advanced semiconductor packaging
- LEDs
- Research

- Printed circuit board assemblies
- Advanced semiconductor packaging
- LEDs

GROWTH DRIVERS

- Increased consumption of packaged foods and convenience items in emerging markets.
- Technology upgrades that deliver improved performance in production lines.
- Emergence of new OEMs in emerging markets.

- Baby diaper/feminine hygiene product penetration at early stages in emerging markets.
- Technology upgrades to deliver improved performance in production lines.
- Emergence of new OEMs in emerging markets.

- Replacement of mechanical fasteners with adhesives.
- Growth in structural PUR reactive hot melts for stronger bonds and greater efficiency.
- Building and construction.

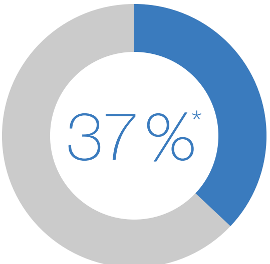
- Rapid growth of flexible packaging.
- Increased use of lightweight, durable plastics in electronics, medical devices, and vehicles.
- Building and construction.

- Proliferation of mobile devices.
- Smaller devices with complex chip architectures.
- Conversion of wire bonded chips to flip chips.
- Expansion of electronics in consumer and industrial devices.
- MEMS devices.

- Flexible substrates.
- Higher density interconnects.
- Plasma deposited coatings.

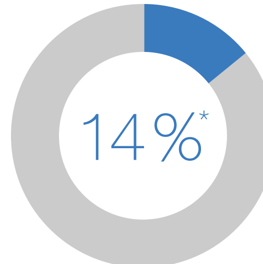
- Complex chip architectures where x-ray inspection is only solution.
- Proliferation of mobile devices.
- Expansion of electronics in consumer and industrial devices.
- Greater need for product quality and integrity.
- LED emergence into general lighting.

- Proliferation of mobile devices.
- Expansion of electronics in consumer and industrial devices.
- Greater need for product quality and integrity.



* Of FY16 Nordson Sales

Industrial Coating Systems



* Of FY16 Nordson Sales

Nordson EFD

Precision manual and automated dispensers and disposable components for applying controlled amounts of adhesives, sealants, lubricants and other assembly fluids.

- Consumer goods
- Electronics
- Food and beverage
- Industrial assembly
- Life sciences
- Photo-voltaics and solar energy
- Transportation

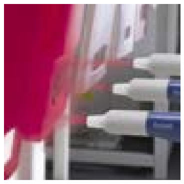
- Expansion of electronics in consumer and industrial devices.
- Replacement of mechanical fasteners with adhesives and assembly fluids.
- Growth and sophistication of medical devices driven by new procedures.
- Expansion of solar energy.
- LED emergence into general lighting.

Nordson MEDICAL

Single-use, engineered, plastic molded fittings, connectors, luers, valves, syringes, tips, tubing and catheters for dispensing and controlling fluids in medical equipment and procedures.

- Anesthesia
- Bone grafts
- Blood management
- Cardiovascular surgery
- Ophthalmic surgery
- Pulmonology
- Wound healing
- Related medical procedures

- Aging populations.
- Geographic expansion.
- Health care improvement in emerging markets.
- New surgical procedures.
- OEM outsourcing.
- Single-use products for sanitary reasons.



Powder Coating Systems

Automated and manual dispensing systems used to apply powder paints and coatings to a variety of metal, plastic and wood products.

- Agriculture, construction, lawn and garden equipment
- Appliances
- General metal
- Home and office furniture, wood and metal shelving
- Pipe coating
- Vehicle components

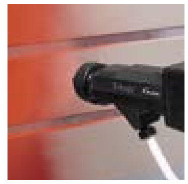
- Environmental advantages of powder coatings.
- Productivity investments and lean manufacturing.
- Consumer demand for customized products.
- Growing oil and gas production.
- Growth of agriculture related equipment.

Container Coating Systems

Automated and manual dispensing and curing systems used to treat and cure food and beverage containers.

- Can marking and identification
- Can neck lubrication
- Compound can end lining
- Inside container coating
- Metal tubes
- Score repair

- Can innovations.
- Technology innovations.
- Emerging applications in glass, plastic and aerosol containers.
- Productivity investments and lean manufacturing.



Liquid Finishing Systems

Automated and manual dispensing systems used to apply liquid paints and coatings to consumer and industrial products.

- Automotive components and wheels
- Construction
- Decorative hardware
- General metal finishing
- Glass bottle coating
- Metal drums
- Wood doors, cabinets and molding

- Building and construction.
- Consumer demand for customized products.
- Productivity investments and lean manufacturing.

Cold Material Systems

Products and systems for dispensing single and multiple component adhesive and sealant materials in general industrial and transportation applications.

- Aerospace
- Alternative energy
- Appliances
- Automotive
- Composites
- Construction
- Electronics
- Medical

- Replacement of mechanical fasteners with adhesives.
- Increased bonding of dissimilar materials.
- Continued penetration of emerging markets.
- Productivity investments and lean manufacturing.

UV Curing Systems

Ultraviolet equipment used in curing and drying operations for coatings, paints and other materials.

- Electronics
- Plastic containers
- Plastic film
- Semiconductor equipment
- Wood and medium density fiberboard

- Expansion of electronics in consumer and industrial devices and innovations in semi-conductors.
- Opportunities in plastic decorating and related applications.
- Productivity investments and lean manufacturing.

Nordson Corporation strives to be a vital, self-renewing, worldwide organization which, within the framework of ethical behavior and enlightened citizenship, grows and produces wealth for our customers, employees, shareholders and communities. Nordson operates to create balanced, long-term benefits for all our constituencies.

Founded in 1954, we engineer, manufacture and market differentiated products
and systems used for precision dispensing and control of adhesives, polymers,
coatings, lubricants, sealants, fluids and biomaterials, with related products for
testing and inspection, and surface treatment. We serve customers in a diverse
set of consumer durable goods, non-durable goods and technology end markets.

We support our products and systems with application expertise and a direct global sales and service organization. Headquartered in Westlake, Ohio, with direct operations in nearly 40 countries, we are everywhere our customers need us.
Our principal facilities are located in Brazil, Germany, Japan, Mexico, the Netherlands, the People's Republic of China, Thailand, the United

Nordson Corporation

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