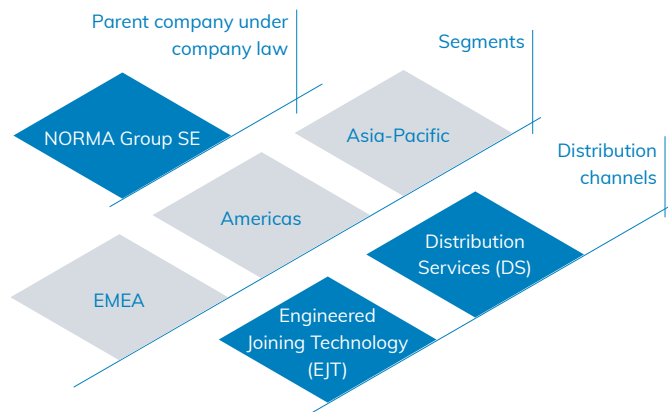


Organizational structure of NORMA Group G007



Via its **Distribution Services (DS)**, NORMA Group markets a broad range of high-quality, standardized brand products. In addition to its own global distribution network, the Company also relies on multipliers such as sales representatives, retailers and importers. Its customers include, among others, distributors, specialized wholesalers, OEM customers in the aftermarket segment, do-it-yourself stores and applications in smaller industries. The brands ABA®, Breeze®, Clamp-All®, CONNECTORS®, FISH®, Five Star®, Gemi®, NDS®, NORMA®, Raindrip®, R.G.RAY®, Serflex®, TORCA® and TRUSTLENE® exemplify technological know-how, high quality and reliability and meet the technical standards of the countries in which they are sold.

NORMA Group combines its expertise in developing tailor-made solutions for industrial customers (EJT) with its global sales of high-quality standardized brand products (DS) to realize not only cross-selling effects, but also numerous synergies in production, logistics and sales. The Company also benefits from significant economies of scale and scope thanks to the diversity and high volumes of its product offerings, a clear distinction from its smaller, generally more specialized competitors.

Market and competitive environment

With its products, NORMA Group provides solutions for numerous industrial applications. Its expertise covers thermoplastic materials (WATER and FLUID) as well as metal-based connection solutions and products (FASTEN). Thanks to the unique combination of expertise in both metal and plastics processing and the broad diversification of its product portfolio, NORMA Group can offer its customers a wide range of solutions to different problems from a single source and thus distinguishes itself from its competitors who mainly specialize in individual product segments.

In the area of Engineered Joining Technology, especially in the area of FASTEN and FLUID, NORMA Group operates in a highly fragmented market, which is characterized by a very heterogeneous structure due to the abundance of specialized industrial companies. In this environment, NORMA Group sees itself as a provider of tailor-made, value-creating solutions that are geared to the specific needs of the customer and are the result of long-term development partnerships. With its international business alignment and its cross-industry customer base, NORMA Group distinguishes itself from its mostly regional competitors. Thanks to its strong focus on innovation, NORMA Group offers its customers especially temperature and pressure resistant products, as well as weight and assembly time optimized products that clearly stand out from the competition.

In the much more standardized sales channel Distribution Services, NORMA Group operates in mass markets and competes primarily with providers of similar standardized products. It differentiates itself from them particularly through its strong brands that are the result of a deliberate brand policy that focuses on the regional needs of its customers. In addition, customers appreciate the high quality of service. NORMA Group offers its trade customers a complete range of products that meets all of their end users' needs as well as short delivery times and permanent availability.

Goals and strategy

Increase in value

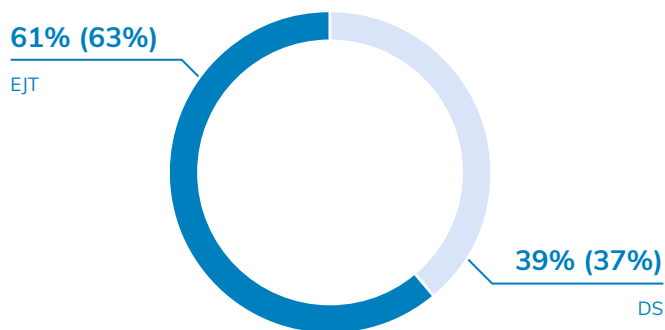
The long-term strategy of NORMA Group is based on the 'Vision 2025', which was launched by the Management Board in 2018. The Vision 2025 includes increasing the value creation of NORMA Group as its central objective, building on NORMA Group's successful entrepreneurial development and focusing on sustained sales growth, profitability above the industry average and the efficient deployment of capital. On its way to achieving these goals, NORMA Group is pursuing a stakeholder-oriented approach that is geared both toward the demands of its customers for innovative and value-creating solutions and to the interests of its shareholders and suppliers. In order to achieve these goals, NORMA Group seeks to offer its employees an environment geared toward continuous improvement, thereby strengthening its position as the employer of choice. At the same time, NORMA Group regards it as a central component of its corporate responsibility to reconcile the effects of its business activities with the expectations and needs of society. For this reason, the Management Board's goal is to base all entrepreneurial decisions on the principles of responsible corporate management and sustainable action. Corporate Responsibility (CR), NORMA Group's responsibility towards people and the environment, is therefore regarded as an integral part of the Company strategy. → 2019 CR REPORT

NORMA Groups' strategy for the long-term increase in value is based on the following key objectives and strategic measures:

### Profitable growth

Increasing the Company's value is the primary objective of NORMA Group. In each regional segment and in both sales divisions (EJT and DS), the focus is on the ongoing profitable expansion of business activities and increasing market share. At the heart of NORMA Group's growth strategy is the expansion of its product portfolio and regional presence, as well as the opening up of new end markets. The continuous expansion of application solutions for current EJT customers, the identification and acquisition of new EJT customers, the deepening of the customer base in Distribution Services (DS) and the identification of new markets with attractive growth potential will all be used to expand business activities and further strengthen the Group's international presence. In identifying new end markets, NORMA Group places a strategic focus on niche markets with attractive margins, advanced products, strongly growing sales potential and a fragmented competitive structure. The goal is to achieve broad diversification in the end markets through the targeted transfer of knowledge to new, high-growth industries. This will strengthen the sustainable earnings profile, the independence from economic influences and the stability of the business. Global megatrends such as climate change and resource scarcity offer NORMA Group attractive growth potential. The strategic focus is therefore on future-oriented applications in the fields of water management and electromobility. → [PRODUCTS AND END MARKETS, P. 47](#)

Sales by distribution channel <sup>1</sup> G008



<sup>1</sup> Previous year's values in brackets.

### Selective product portfolio

The technological requirements placed on the end products of NORMA Group customers are constantly changing. Increasing environmental awareness, scarcity of resources and growing cost pressures play a major role in almost every sector of industry. Furthermore, the automotive and commercial vehicle industries, in particular, are subject to stricter emission regulations and special requirements for the materials used. This is also accompanied by increasing technological change, away from conventional combustion engines towards alternative powertrain techniques such as hybrid or electromobility. → [LEGAL AND REGULATORY INFLUENCING ASPECTS, P. 60](#) These form the starting point for the development of new products. NORMA Group focuses on value-enhancing solutions that support its customers in reducing emissions, leaks, weight, space and assembly time. Furthermore, NORMA Group helps its customers to optimize the use of scarce resources, for example in water management. Innovations play an important role in meeting the increasing customer demands that accompany each new production cycle. This is why NORMA Group's more than 300 engineers and developers are constantly working on developing new products and optimizing the currently used processes and systems. An

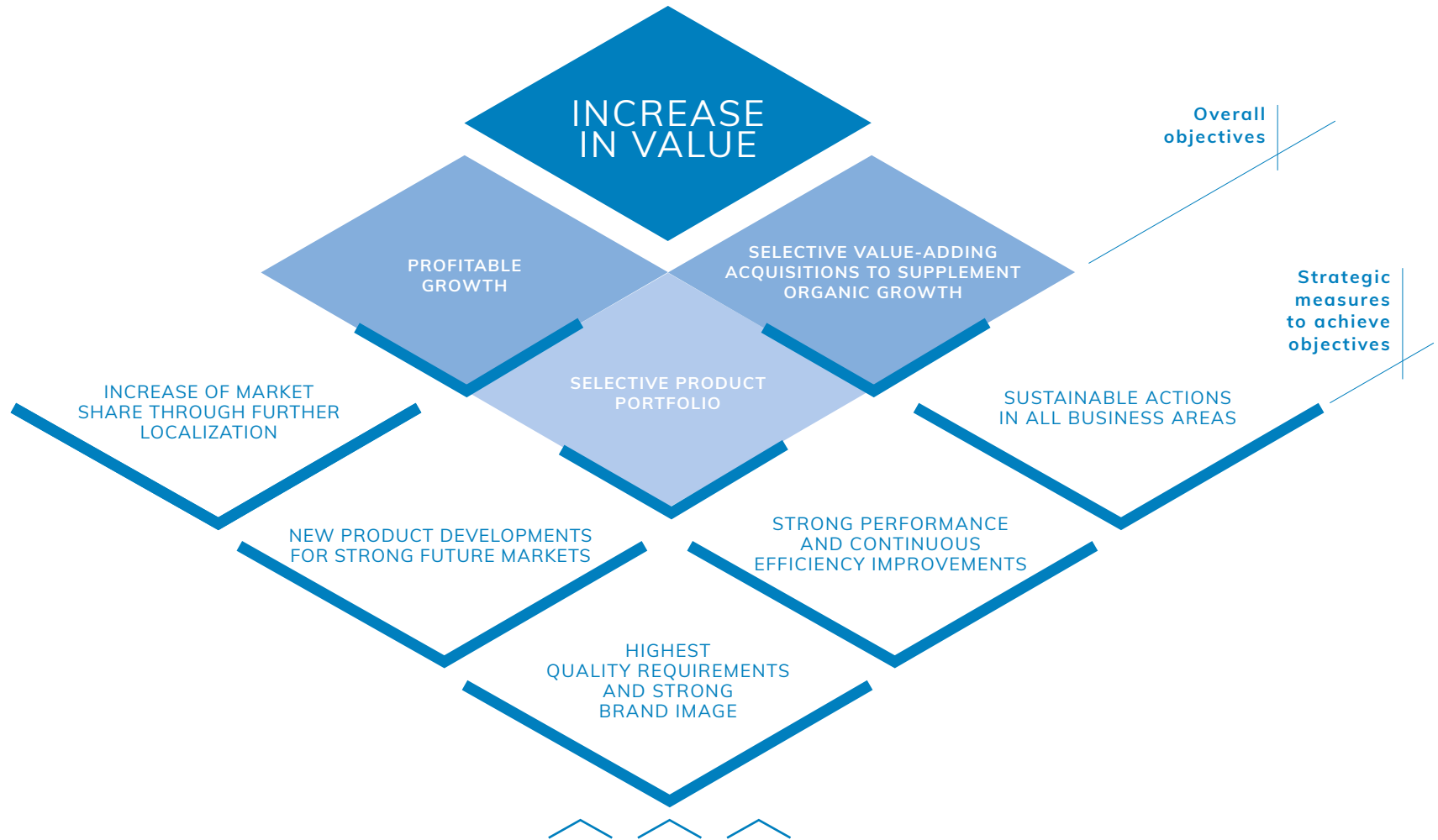
important focus here is on the development of solutions for electromobility. This offers NORMA Group numerous opportunities, particularly in the field of vehicle thermal management. In order to sustainably strengthen its innovative strength, the Group plans to invest around 5% of its EJT sales in research and development activities each year. → [RESEARCH AND DEVELOPMENT, P. 55](#)

Although the joining products that NORMA Group sells make up a relatively small value proportion of the final product, they are often mission-critical. Sticking to the highest quality standards and stringent quality management throughout the entire Group therefore play a crucial role. → [QUALITY MANAGEMENT, P. 75](#) A strong brand strategy geared toward regional growth targets, as well as ensuring first-class service quality and product availability at all times, are also important success parameters. NORMA Group ensures this through its worldwide sales network.

### Selective acquisitions to supplement organic growth

By making select acquisitions, NORMA Group contributes to the diversification of its business and strengthens its growth. Acquisitions are therefore an integral part of the Company's long-term growth strategy. NORMA Group observes the joining technology market continuously and contributes to its consolidation through targeted acquisitions. In total, NORMA Group has acquired 14 companies since the IPO in 2011 and integrated them into the Group. The main focus of M&A activities is always on companies that help to realize the diversification objectives of NORMA Group, to strengthen its competitive position and / or to generate synergies. The preservation of growth and high profitability also play an important role. The search for suitable companies focuses on the automotive and water management sectors. Since acquiring the US water specialist National Diversified Sales (NDS) in fiscal year 2014, NORMA Group has built up an established market position in the fast-growing water industry, which is to be expanded through further acquisitions in this area.

**MARKET LEADER IN CONNECTING AND FLUID HANDLING TECHNOLOGY FOR EXISTING AND FUTURE MARKETS**



**CLIMATE CHANGE AND SCARCITY OF RESOURCES**  
 ARE GLOBAL MEGATRENDS WHICH FORM THE BASIS FOR  
 NORMA GROUP'S BUSINESS MODEL

## Control system and control parameters

The consistent focus on the Group objectives mentioned is also reflected in the internal control system at NORMA Group, which relies on both financial and non-financial control parameters.

### Important financial control parameters

The following value-based indicators, which have a direct impact on value creation at NORMA Group, are among the Company's most important financial performance indicators: organic Group sales growth, profitability (adjusted EBITA margin) and net operating cash flow. These key figures form NORMA Value Added (NOVA), a central strategic target figure. Since NOVA is also a reference value for the long-term remuneration of the Management Board, it was added to the control system in fiscal year 2018.

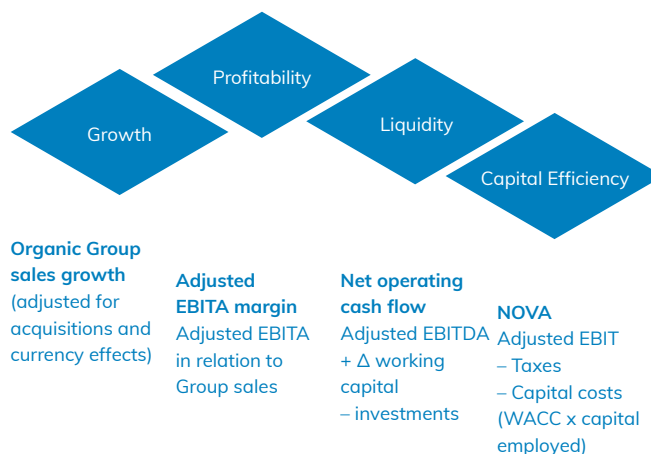
→ REMUNERATION REPORT, P. 102

#### Organic sales growth

As a growth-oriented Company, NORMA Group attaches particular importance to profitable sales growth. The Group seeks to achieve short- and medium-term growth above the market average. This refers to internal growth excluding currency effects. In addition, sales revenues from newly acquired companies are reported separately within the first 12 months of initial consolidation (sales revenues from acquisitions).

Due to the broad market structure in the area of joining technology, the Management Board is guided by internal analyses as well as studies by leading economic research institutes on the development of the gross domestic product of the respective regions and on the production and sales figures of the relevant

### Important financial control parameters G010



customer industries in developing the forecast on the expected development of sales. In addition, the Management Board observes certain early indicators, such as customer order patterns in the retail business (Distribution Services) and the order book in the area of Engineered Joining Technology (EJT).

#### Adjusted EBITA and adjusted EBITA margin

The adjusted EBITA (EBITA before special influences) is the most important internal and external performance indicator for ongoing operations. In order to be able to make a long-term comparison and for a better understanding of how the business is developing, NORMA Group adjusts the operating result by certain expenses, for example those that are related to acquisitions.

→ NOTES, P. 148

Adjusted EBITA margin (EBITA as a percentage of sales) as another key indicator for the NORMA Group provides information on the profitability of its business activities. In order to maintain the adjusted EBITA margin and thus the Group's profitability at its high level, NORMA Group continuously works on optimizing its business processes and structures.

To determine the EBITA target margin, both the historic performance and the planning of individual business units are taken into consideration. The target margin for the Group is determined as the weighted average of the divisions. Price development of the raw materials that are most important to the NORMA Group serves as an early indicator of changes in major cost items, such as material costs. For this reason, the respective markets and raw material prices are constantly monitored and the prices of key materials are contractually fixed.

#### Net operating cash flow

In order to maintain the Group's financial independence and solvency at all times, NORMA Group is guided by net operating cash flow in addition to the aforementioned key figures. Net operating cash flow includes the most important cash-effective items that can be influenced by the individual business units and provides information on whether NORMA Group can finance its operating business out of its cash flow. It is calculated on the basis of the adjusted EBITDA plus changes in working capital minus capital expenditures. The key approaches to improving net operating cash flow are therefore to increase sales, to improve the adjusted operating result (adjusted EBITDA) and to engage in sustained value-enhancing investment activity. In addition, consistent management of working capital also has a positive effect on net operating cash flow.

### NORMA Value Added (NOVA)

NORMA Group's goal is to use the capital provided by its shareholders and lenders as efficiently as possible in order to secure the Group's long-term positive development. In order to manage this, NORMA Group determines the annual value creation in the form of NORMA Value Added (NOVA), which is calculated on the basis of adjusted EBIT, the tax rate and the cost of capital. The cost of capital is defined by the weighted average cost of capital (WACC) and capital employed (equity plus net debt).

$$\text{NOVA} = (\text{adjusted EBIT} \times (1 - t)) - (\text{WACC} \times \text{capital employed})$$

Adjusted EBIT after taxes <sup>1</sup>	T008	
	2019	2018
Adjusted EBIT (in EUR million)	135.0	164.5
Group tax rate (in %)	27.1	24.9
Taxes (in EUR million)	36.7	41.0
<b>Adjusted EBIT after taxes (in EUR million)</b>	<b>98.4</b>	<b>123.5</b>
– WACC x capital employed	81.1	62.8
<b>NOVA (in EUR million)</b>	<b>17.3</b>	<b>60.8</b>

Capital employed as of beginning of the year (Jan 1) <sup>1</sup>	T009	
	2019	2018
Equity (in EUR million)	602.4	534.3
Net debt (in EUR million)	400.3	344.9
<b>Capital employed (in EUR million)</b>	<b>1,002.8</b>	<b>879.2</b>

The cost of capital rate is calculated on the basis of the following assumptions and calculations:

Assumptions for the calculation of the WACC <sup>1</sup>	T010	
in %	2019	2018
Risk-free interest rate	0.20	0.39
Market risk premium	7.50	6.50
Beta factor of NORMA Group	1.33	1.28
Cost of equity rate	11.01	9.41
Borrowing cost rate after taxes	1.79	1.85
<b>WACC after taxes</b>	<b>8.09</b>	<b>7.14</b>

The base interest rate is derived from the interest rate structure data of Deutsche Bundesbank (three-month average: October 1 to December 31). The market risk premium represents the

difference between the expected return of a risky market portfolio and the risk-free interest rate. NORMA Group uses the recommendation of the Institut der Wirtschaftsprüfer (IDW) to determine this risk premium. The betafactor represents the individual risk of a share compared to a market index. It is first determined as the average value of the unindebted beta factors of the peer group and then adjusted to NORMA Group's individual capital structure. The cost of equity is calculated by adding the risk-free interest rate and the weighted country risk of NORMA Group with the product of the market risk premium and the indebted beta factor of the peer group. The credit spread used to calculate the cost of debt was determined on the basis of the terms of the current external financing of NORMA Group. Invested capital is calculated from consolidated equity plus net financial liabilities as of January 1 of the fiscal year.

The financial control parameters are planned and continuously monitored in the Group, but also for the most part at the segment and Group company levels. Deviations between planned and actually achieved values are tracked in the local companies and aggregated at the regional segment level as part of the monthly analysis. Business development is regularly forecast on the basis of available monthly and quarterly results and under the assumption of various scenarios.

### Important non-financial control parameters

The most important non-financial control parameters for NORMA Group include the extent of market penetration, the Group's power of innovation, the problem-solving behavior of its employees and the sustainable overall development of NORMA Group as a whole.

The values considered for the calculation of NOVA are shown without the effects of IFRS 16 as these are relevant for the management remuneration.

### Market penetration

NORMA Group always pursues the objective to sustainably expand its business and achieve sales growth and profitability that are higher than average by industry comparison. Particularly by offering innovative solutions, NORMA Group is able to create value creation potential in various areas of application and numerous industries. The Group's organic growth is thus a sign of NORMA Group's market penetration.

### Invention applications

The Group considers ensuring an environment of sustainable innovation a key driver of future growth. NORMA Group therefore measures the number of annual invention applications. NORMA Group employees submit invention applications as part of an internal formalized process upstream of the external process of new patent applications. By establishing targeted internal incentive systems, NORMA Group promotes its employees' innovative thinking.

### Quality KPIs

NORMA Group stands for the highest possible reliability and quality of service. The reputation of its brands and reliability of its products are key factors in the Company's success. In developing and manufacturing products, the Group therefore relies on the highest quality standards. In order to minimize production losses and maximize customer satisfaction, NORMA Group measures and manages the problem solving behavior of its employees by using two performance indicators: the average number of customer complaints per month and defective parts per million of manufactured parts (parts per million / PPM). The two metrics are collected and aggregated at Group level on a monthly basis. → [QUALITY MANAGEMENT, P. 75](#)

### Other non-financial performance indicators

Other non-financial performance indicators include employee and environmental indicators and indicators on occupational safety and healthcare within the Group. More information can be found in the → [2019 CR REPORT](#).

The target figures for the financial and non-financial control parameters for 2020 and the assumptions underlying the forecast are presented in the → [FORECAST REPORT, P. 82](#)

### Financial control parameters

T011

	2019	2019 (excl. IFRS 16 effects)	2018	2017	2016	2015	2014	2013
Group sales (in EUR million)	1,100.1	1,100.1	1,084.1	1,017.1	894.9	889.6	694.7	635.5
Adjusted EBITA margin (in %) <sup>1</sup>	13.2	13.1	16.0	17.2	17.6	17.6	17.5	17.7
Net operating cash flow (in EUR million)	122.9	111.6	124.4	132.9	148.5	134.7	109.2	103.9
NORMA Value Added (in EUR million)	17.3	17.3	60.8	54.9	53.1	48.3	n/a	n/a

<sup>1</sup>The adjustments are shown in the → [NOTES, P. 148](#)

### Non-financial control parameters

T012

	2019	2018	2017	2016	2015	2014	2013
Number of invention applications <sup>1</sup>	22	32	33	n/a	n/a	n/a	n/a
Defective parts per million (PMP) <sup>2</sup>	6	7	16	32	21	17	24
Quality-related customer complaints per month <sup>2</sup>	6	7	9	8	8	8	9

<sup>1</sup>The number of invention applications has served as a key control parameter for measuring the Group's innovative ability since mid-2016, replacing the number of patent applications, a figure that had lost significance in light of changes in the patent strategy. Since the number of invention applications was recorded for the first time for fiscal year 2017, there are no comparative figures for the previous years.

<sup>2</sup>Statek, which was acquired in 2018 and the newly established plant in Tijuana are not yet included here.

## Goals regarding finance and liquidity management

NORMA Group's objectives with respect to central finance and liquidity management have not changed since the previous year and are as follows:

### I. Ensuring solvency at all times

The main financial objectives are maintaining the necessary liquidity for the Group's operating business at all times, maintaining sufficient strategic liquidity reserves and thus ensuring NORMA Group's long-term solvency. This also includes maintaining sufficient liquid funds for short- to medium-term acquisitions.

Rolling, regular, currency-differentiated liquidity planning for all major Group companies, which is analyzed and aggregated by the centrally organized Group Treasury, forms the main strategic cornerstone of NORMA Group's financial management.

Financing flexibility is ensured by maintaining the appropriate credit lines. These are negotiated loan commitments, which can be utilized within a very short period of time and thus can compensate for liquidity peaks. NORMA Group has a revolving credit line within its syndicated bank loan. This credit lines can be used in different currencies and terms. NORMA Group uses Asset Backed Securities (ABS), factoring and reverse factoring programs to manage liquidity, optimize working capital and make its cash flows more predictable.

The financing measures conducted in fiscal year 2019 are described in detail in the notes to the financial position.

→ [FINANCIAL POSITION, P. 69](#)

### II. Limiting financial risks

The Group Treasury division constantly identifies and assesses interest rate and currency risks and selects suitable hedging instruments to reduce these risks. Here, not only derivatives, but also the appropriate foreign currency financing, are used to reduce currency risks. The overall goal is to optimize the assets and liabilities side of the balance sheet with regard to currency risks. In addition, operating currency risks are reduced by using derivative financial instruments in the Group companies as of a defined threshold. Here, Group-wide, currency-differentiated liquidity planning is crucial to identifying and managing such risks.

To limit interest rate risks, NORMA Group's objective is to devise a relatively high proportion of financing measures in such a way that they are subject to interest rates on a fixed-interest basis or use interest rate swaps. On December 31, 2019, around 41% of all debt instruments had variable interest rates and were not hedged by interest rate swaps. In addition, existing risk positions are monitored regularly by Group Treasury and assessed for their risk-bearing capacity. Group Treasury initiates appropriate countermeasures if the defined risk parameters are exceeded.

Key elements of the policy on limiting financial risks are the clear definition of process responsibilities, multi-stage approval processes and regular risk assessments.

### III. Optimizing the Group's internal liquidity

NORMA Group Holding GmbH assumes central liquidity management and is responsible in particular for investing surplus liquidity as well as for intra-Group financing. The Group Treasury of NORMA Group constantly works on improving internal financing opportunities and bundling the Group's liquidity in order to make it available for a wide variety of funding purposes. This is achieved by optimizing the allocation of cash and cash equivalents in NORMA Group Holding

and at the same time ensuring that the respective individual companies are solvent at all times. This is done by using a professional treasury management system that provides a daily overview of the cash holdings of the most important subsidiaries. Regional cash pools have been installed to enable the technical implementation of liquidity centralization. Further cash concentrations are carried out at regular intervals. Manually pooling funds makes it possible to guarantee an optimized cash balance for all Group companies, whereby the local terms for international payments must be taken into account here, in particular.

## Research and development

Research and development activities at NORMA Group are aimed at further expanding the Group's power of innovation and detecting and addressing technological trends, such as electromobility and digitalization, as early as possible. The focus is on opening up new markets, winning new customers and developing new products and system solutions. That includes evaluating new technologies, especially in terms of their ability to optimize existing processes, minimizing the use of materials and improve the functionality of end products. Research is mainly focused on finding solutions for the global industrial challenges of the respective end markets. By concentrating on the megatrends of importance to its customers, particularly reflected in increasing environmental awareness and the economical use of resources, NORMA Group is able to initiate technology developments at an early stage and serve the market by offering appropriate product solutions and services. Another strategic focus is also on water management.

In the context of the implemented reorganization of the product group structure (WATER / FLUID / FASTEN) in fiscal year 2019, smaller organizational restructurings in the R&D department as well as adjustments within the idea evaluation process and the team composition were undertaken.



## Focus on innovations

The focus of NORMA Group's R&D department is on strengthening the Company's power of innovation. The focus is therefore on early identification of new technological trends and the systematic planning and implementation of product developments. The Foresight Manager is responsible for observing the relevant end markets, bundling the knowledge acquired and integrating it into the internal innovation management process.

In addition, NORMA Group makes use of new methods and innovation management processes, such as 'Innovation Roadmapping' and employs so-called 'Innovation Scouts.' As part of 'Innovation Roadmapping,' long-term technology development schedules are drawn up that take into account the industrial megatrends that have been identified as well as their impact on the relevant markets and resulting requirements for potential new products. 'Innovation Councils' are driving the implementation of the projects identified. For example, the Innovation Council 'E-Mobility' is responsible for coordinating all information and global activities on electromobility, developing a strategy geared to all regions and business sectors, and pressing ahead with its implementation. Another Innovation Council is also working on the subject of digitalization. Innovation Scouts – dedicated NORMA Group employees who collect ideas on future trends across the Group and evaluate their feasibility – are intensively involved in the innovation process.

In an effort to promote innovative thinking within the Group, NORMA Group measures the number of invention applications submitted by its employees. An invention application takes place as part of a formalized internal process in which NORMA Group employees are given the opportunity to submit their ideas to the R&D department. The process of reporting an invention is upstream of the external process of applying for a new patent

and is specifically supported by internal incentive systems such as the annual Innovation Excellence Award.

Thanks to these measures, NORMA Group expects to not only be able to focus on innovations better in the years to come, but also to increase its efficiency in the areas of product and customer development.

## Strategic collaboration with customers and research institutes

In the area of EJT, NORMA Group works closely with its end customers, but also with research and development institutes, suppliers and other external partners. This allows for customer demands to be identified immediately and seamlessly turned into new technologies and product ideas. This, in turn, allows for fast marketing of product innovations. For competitive reasons, however, the Company does not disclose the specific nature of these research partnerships.

As the Distribution Services division is purely a commercial unit, the market does not demand the same level of technological research from it. Moreover, customers of NORMA Group in this business division expect a strong brand image, constant availability of products, and the most complete product range. Therefore, the focus in the DS area lies on making useful additions to the product range and targeted marketing activities.

→ [MARKETING, P. 80](#)

## Development focuses in 2019

R&D activities in fiscal year 2019 were again dominated by the three major trend themes of electromobility, digitalization and water management. In electromobility, the thermal management of batteries is currently a key topic. To this end, NORMA Group is developing special fluid systems that ensure even temperature distribution inside the battery and maintain the optimal operating condition of the cells. Factors such as flow cross-sections, flow resistance and heat transfer play a key role in optimized thermal management. In fiscal year 2019, NORMA Group successfully supported several customer projects in finding individual solutions.

In addition, the R&D department is currently working on concepts for the development of intelligent fluid systems that are capable of automatically and wirelessly recording, evaluating and communicating assembly conditions and operating parameters. The first concepts on this have already been developed.

NORMA Group has also been active in the area of fuel cells since 2018 and is already supplying line systems for a fuel cell vehicle in series production. This activity resulted in a fundamental project as well as follow-up projects for further vehicle platforms from the same manufacturer in fiscal year 2019. In addition, a project involving a major supplier of hydrogen vehicles was also initiated in 2019.

## Know-how protected by patents

The Company's specific know-how in the area of joining technology represents a key success factor for NORMA Group. For this reason, the Group protects its innovations with patents. As of December 31, 2019, 1,094 patents and utility models (2018: 1,038) were held. In 2019, 46 new patent rights (2018: 65) were filed.



### R&D expenses

EJT research and development expenditure in 2019 amounted to EUR 31.2 million (2018: EUR 30.5 million), representing approximately 4.7% (2018: 4.5%) of EJT revenue. The capitalization ratio, which is the proportion of own work capitalized in relation to R&D expenses, during the reporting year amounted to 9.0% (EUR 2.8 million).

### R&D employees

As of December 31, 2019, 345 employees (2018: 365) worldwide worked for NORMA Group in the R&D department, which represents unchanged to the prior year approximately 5.3% of all permanent employees of the Group. Most of the employees who work in R&D are engineers, technicians and technical draftsmen.

#### R&D key figures <sup>1</sup>

	2019	2018	2017	2016	2015	2014	2013	2012	T013
Number of R&D employees	345	365	344	305	271	250	205	190	174
R&D employee ratio in relation to permanent staff (in %)	5.3	5.3	5.6	5.6	5.3	5.2	5.0	5.1	5.1
R&D expenses in the area of EJT (in EUR million)	31.2	30.5	29.4	28.8	25.4	25.7	21.9	22.1	16.8
R&D ratio in relation to EJT sales (in %)	4.7	4.5	4.6	5.4	4.7	5.3	4.9	5.1	4.1

<sup>1</sup>The multi-period overview shows the development of the most important R&D indicators since NORMA Group's IPO. No data was collected prior to the IPO.



### Inspired by nature

The loss in pressure inside the cooling systems that is caused by the many coils and constricted areas inside these systems poses one of the biggest challenges in the thermal management of batteries in electric vehicles.

To solve this problem, NORMA Group uses the findings from the field of bionics and is oriented towards existing role models in nature, such as shark skin. Its special grooved structure with movable scales along the shark's entire body significantly reduces flow resistance. This 'shark skin effect' is to be applied to thermal management systems in the future, by giving the interiors of the lines longitudinal grooves, for example. This will allow liquids to flow through them more quickly and easily to maintain the pressure and improve the battery's performance and range. The flow shapes of rivers have also inspired us to take new approaches. Read more about it at [BLOG.NORMAGROUP.COM](https://www.blog.normagroup.com)

The information in the above box is not part of the Consolidated Management Report and therefore is not subject to the audit.