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LANXESS – Energizing Chemistry

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Dear friends of LANXESS,

Since the last edition of the LANXESS factbook was published in 2017, the face of LANXESS has substantially changed. Our transformation is well on track and we have already reached important milestones on our journey to make LANXESS a more resilient, more profitable and more sustainable company. This factbook provides you with a deep dive into LANXESS’ businesses and the drivers to execute our strategy.

We continued to upgrade our portfolio with several transactions. The biggest impact surely came from the faster than scheduled exit from the rubber JV ARLANXEO. Thus, we substantially reduced dependency on volatile raw materials and more than halved the automotive end market exposure to currently ~20%. We further strengthened our set-up by acquiring the U.S. phosphorus business of Solvay and divested several non-core businesses.

With the disposal of the 40% stake in the site service provider CURRENTA, we will monetize significant hidden reserves and secure our strategic interests on a long-term basis. The exit of the Chrome Chemicals business is part of the realignment of our Performance Chemicals segment towards specialty chemistry with focus on regulated Consumer Protection Chemicals.

Operationally, the acquired Chemtura businesses were integrated faster than targeted. The majority of identified cost synergies of €100m have already been realized. We improved our end market split, making it more balanced and less dependent on the automotive industry, as well as establishing a more balanced global footprint, now with a greater presence in growth markets like Asia and the U.S. All of our businesses have leading market positions in attractive medium-sized or niche markets.

Our organic investments into brownfield and de-bottlenecking projects will total €400 m in 2020, since their announcement in 2017 – and contribute to growth and improved margins with an average ROCE of 20%. As a result, we already entered the corridor of 14 to 18% EBITDApre margin targeted through the cycle - despite a difficult environment. And we will continue to invest and improve our businesses by further realignments.

We also significantly improved our financial position. The ARLANXEO exit led to a meaningful net debt reduction. Part of the proceeds were used for a share buyback and pension funding. Additionally, our solid financials will be further improved by the proceeds of the Currenta divestment in Spring 2020. Thus, we have accomplished a strong balance sheet and financial flexibility. We intend to use this flexibility as a sound platform for further growth while maintaining our commitment to a solid investment grade rating.

We are convinced that economic growth has to be based on sustainable goals and an applied corporate responsibility. LANXESS is committed to the Paris Agreement and has stipulated its corporate responsibility goals according to the United Nations’ Sustainable Development Goals. As one of the first global chemical companies to commit, LANXESS has defined a clear path to reduce CO2 emissions and become climate neutral by 2040. Sustainability is a priority to us and we will seize it as a competitive advantage.

We are excellently positioned to keep growing profitably and create even more value in the future.

Sincerely,

Matthias Zachert
Chairman of the Board of Management
LANXESS – A globally operating specialty chemicals company

- Spin-off from Bayer in 2004
- Specialty chemicals portfolio: Chemical intermediates, additives, specialty chemicals and engineering materials

- 60 production sites worldwide
- Approximately 15,400 employees in 33 countries
- Global sales of €7.2 bn in 2018

- Strengthening of leading positions in medium-sized markets
- Consolidation in Europe, expansion in USA and Asia

LANXESS – A global specialty chemicals group

<table>
<thead>
<tr>
<th>Advanced Intermediates</th>
<th>Specialty Additives</th>
<th>Performance Chemicals</th>
<th>Engineering Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Industrial Intermediates</td>
<td>Lubricant Additives Business</td>
<td>Material Protection Products</td>
<td>High Performance Materials</td>
</tr>
<tr>
<td>Saltigo</td>
<td>Polymer Additives</td>
<td>Inorganic Pigments</td>
<td>Urethane Systems</td>
</tr>
<tr>
<td>Rhein Chemie</td>
<td></td>
<td>Leather</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Liquid Purification Technologies</td>
<td></td>
</tr>
</tbody>
</table>

Group Functions and countries

Business unit set up fosters dedication and entrepreneurship
LANXESS well diversified, worldwide present and serving a broad range of customers

**LANXESS’ key figures by region 2018**

- Employees: 15,441
- Sales: €7,197 m
- Capex*: €497 m

*Net of financial lease, projects financed by customers and capitalized borrowing costs

**Sales by industry 2018**

- Chemicals: 23%
- Construction, E&E, Leather: 17%
- Automotive: 6%
- Agro: 15%
- Others: 5%

**LANXESS with clear strategic focus:**
Building a more balanced company

- More resilient
- Strong cash generation
- Solid platform for growth
Organization with global responsibility – The board of LANXESS AG

Matthias Zachert
CEO
Hubert Fink
Board of Management
Michael Pontzen
CFO
Rainier van Roessel
Board of Management
Anno Borkowsky
Board of Management

- Corporate Communications
- Corporate Development
- Digital Transformation
- Legal & Compliance
- Performance Culture

- Global Procurement & Logistics
- Production, Technology, Safety & Environment
- Business Units
  - Advanced Industrial Intermediates
  - Saltigo
  - High Perf. Materials
  - Urethane Systems

- Accounting
- Corporate Controlling
- Information Technology
- Mergers & Acquisitions
- Tax & Trade Compliance
- Treasury & Investor Relations
- Global Business Services

- Human Resources
- Performance Culture
- Business Units
  - Material Protection Products
  - Inorganic Pigments
  - Liquid Purification Technologies
  - Leather

- Business Units
  - Lubricant Additives Business
  - Polymer Additives
  - Rhein Chemie

Board of Management is dedicated to all aspects of a sustainable, resilient, and successful business

Our path towards a more resilient and attractively growing LANXESS

Milestones of transformation

- Sale of Chrome Chemicals Business
- Sale of ARLANXEO to Saudi Aramco
- Acquisition Phosphorous Chemicals (PC)
- Acquisition
- Acquisition Clean & Disinfect (C&D)
- Restructuring & Foundation Rubber JV

Energizing Chemistry
LANXESS – A sustainable and reliable partner for the future

- **Committed to Sustainability**
  - Clear target definition to become climate neutral until 2040
  - Member of Dow Jones Sustainability World & Europe Index and Carbon Disclosure Project (CDP)

- **Driving Digitalization**
  - Driving new digital business models
  - Close collaboration with customers to develop digital integration

- **Leveraging Critical Mass**
  - Stock-listed company with €7.2 bn sales
  - Financial resources to support growth

- **Living Performance Culture**
  - Differentiating by a fast, dynamic and agile corporate culture
The way forward – Providing direction from four perspectives

Strategy

- Continuous portfolio management
- Fix underperforming businesses
- Innovation
- Digitalizing the value chain

The way forward – Continuous Portfolio Management

Strategy

Why do we like Consumer Protection Chemicals?
Perfect match: The characteristics of Consumer Protection Chemicals and our competences

Characteristics:
- High entry barriers due to increasing regulation
- Strong expertise in Regulatory Affairs
- Data ownership* essential for product registration
- Attractive secular growth, independent of industry cycles

Our competences:
- Global set-up in Regulatory Affairs
- Regulatory competence: One of the largest global expert teams in the industry
- Unique Portfolio in Animal Protection Chemicals

LANXESS Consumer Protection: Our products follow strong application-driven trends

Food Safety: ~5% Sales CAGR* (2013–2019)
Water Purification: ~5% Sales CAGR* (2013–2019)

* CAGR figures represent LANXESS sales growth.
The way forward – Continuous Portfolio Management II

How do we allocate capital?

Capital allocation follows clear individual strategies for each business

<table>
<thead>
<tr>
<th>Business Segment</th>
<th>Organic growth/Capex</th>
<th>Likelyhood for M&amp;A</th>
<th>Turnaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Intermediates</td>
<td></td>
<td></td>
<td>Organometallics</td>
</tr>
<tr>
<td>Specialty Additives</td>
<td></td>
<td></td>
<td>Rubber additives</td>
</tr>
<tr>
<td>Performance Chemicals</td>
<td></td>
<td></td>
<td>Chrome value chain Membranes business</td>
</tr>
<tr>
<td>Engineering Materials</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The way forward – Fix underperforming businesses

Rigorously addressing under-performing businesses across our portfolio

Sales of businesses to be addressed

~€800 m

Transforming action

- Solving the Chrome problem
- Accelerating OMS performance to peer level
- Turnaround Rubber Additives and Membrane businesses

Target structure

~€500 m

Target structure

~€500 m

Margin Level:

~8%

% % %

*Realignment focused on Chrome value chain, sales contribution includes Chrome Chemicals sold to Brother Enterprises, closing expected in 2019; subject to antitrust approval
Strong progress in solving the Chrome problem

- **Chrome Ore**
  - South Africa
  - Exit
  - IN PROGRESS

- **Chrome Chemicals**
  - South Africa
  - Sold

- **Organic Leather Chemicals**
  - EMEA, China
  - Reposition 2020–2022

*Sold to Brother Enterprises, closing expected in 2019, subject to antitrust approval. LANXESS continues manufacturing at Membank site as part of a 5 years tolling agreement.

Strong progress in improving Organometallics’ performance to competitive peer level

- **Organometallics Sales**
  - 2018: ~€160 m

  - Aluminium based
  - Gallium based
  - Tin based

  - Margin Level: 0–5%

- **Transforming action**
  - Aluminium based Organometallics: Set for organic growth
  - Tin based Organometallics: Exit partner found with PMC
  - Gallium based Organometallics: Exit in preparation

- **Target structure**
  - ~€100 m
  - Margin Level: 15–20%

*LANXESS Electronic Materials, Pyeongtaek (Korea)  LANXESS will continue to manufacture these products on a contract basis for PMC with first exit option end of 2021.
The way forward – Innovation

We focus on product, process, and technology innovation

Our Philosophy
- Result-oriented product innovation
- Process innovation with focus on energy & resource efficiency
- Technology innovation that will change chemical business models (esp. digitalization)

Global innovation platform
- 33 application centers in 14 countries focusing on product innovation
- Dedicated task force teams continuously optimize production processes worldwide
- Centralized digital team to introduce new technologies and change business models

Strong alliances
- More than 150 research cooperations with customers, universities and other research institutes worldwide
- Collaboration with leading AI specialists Citrine, Palantir, et al.
Identifying innovations that fit to our business –
A natural preservative derived from an edible fungus

Acquisition of IMD Natural Solutions completed in 2017
- 9 FTE with a lab in Dortmund, Germany

Rationale
- Strong trend to replace chemicals with natural preservatives
- LANXESS has a global sales force and regulatory expertise
- Currently no comparable natural product on the market

Potential:
- Key market: USA; FDA approval received in 2018, further market approvals in preparation
- First meaningful sales in 2020
- Full potential to be reached 2025–2030

Accessible initial market (USA)
~€200–250 m

Identifying innovations that fit to our business –
Tepex: Fiber reinforced high performance plastic

Acquisition of Bond Laminates completed in 2012
- ~80 FTE.
- Purchase Price: ~€35 m, additional investments to follow

Rationale
- Leading manufacturer of thermoplastic composites
- Customer advantages:
  - Easier product handling
  - Potential to reduce production costs
  - Product functionality (strength and stiffness)

Potential:
- Strong market potential e.g. in automotive, consumer electronics, industry, and sports (e.g. solar panels, helmets)

~€300 m sales potential in 2030
We consider E-Mobility as a major opportunity

E-Mobility: Key driver for battery growth
- Battery demand grew by 30% p.a. (2010-2018) to 180 GWh\(^1\)
- Globally, E-Mobility will account for >85% of total battery demand\(^2\)

High share of chemicals
- Chemicals account for >50% of total cost of battery cells
- Announced cell capacities lead to €8-9 bn p.a.\(^3\) chemicals demand

Growth markets
- Changing battery market: An Asia dominated market will turn into a global market with increasing shares for EU & US
- E-Mobility growth drives ramp-up of cell production sites in Europe
- Supportive governmental regulation

LANXESS offers key products for Li-Ion batteries

Battery Housing
- PA/PBT compounds for new components of the e-powertrain (BU HPM)

Electrolyte
- Key materials (Hydrofluoric acid, phosphorus chemicals) for electrolyte salt (\(\text{LiPF}_6\)) (BU AII/BU PLA)
- Flame retardants (BU PLA)

Cathode & Anode
- Iron oxide as precursor for cathode active material (BU IPG)
- Ion-exchange resins for refining battery grade cobalt, nickel and lithium (BU LPT)
- Lithium chemicals from tail-brine (BU PLA)*

---

* Global Battery Alliance \(^1\) relates to 2030 / McKinsey \(^2\) relates to 2020 onwards

---

PA = Polyamid / PBT = Polybutylene terephthalat  PLA = Polymer Additives  AII = Advanced Industrial Intermediates  IPG = Inorganic Pigments  HPM = High Performance Materials  LPT = Liquid Purification Technologies

* In case of successful feasibility
Cooperation with Standard Lithium could deliver upside in a promising market

**JV characteristics**
- 60–70% LANXESS ownership
- Exclusive access to technology in Smackover formation
- Absorption of El Dorado infrastructure cost

**Project rationale**
- Use existing site infrastructure
- Brines from bromine wells in El Dorado contain Lithium
- Lithium demand growing double digit
- Limited additional cost during piloting
- In case of successful pilot project: €100–400 m capex possible

**The way forward – Digitalizing the value chain**

**Strategy**
What are we focusing on?
Digitalizing the value chain
LANXESS to be digital leader in the chemical industry

From itemized elements …

Digitalizing the value chain: CheMondis
Paving the way to the future of trading chemicals

Project start in 2017: LANXESS' chemical industry knowledge combined with external digital experts
Pioneering into digital trading platform for chemicals to get ready for digital future
First minimal viable product (MVP) created in 2018, preparation of fully separated industry platform

Largest and fastest growing B2B marketplace for industrial chemicals in the western world
Exceptional team of skilled and dedicated experts combining chemical, digital and technical know-how
Unique setup, backed by industry know-how and capital

*CheMondis is a stand-alone company, neither run, governed nor represented by LANXESS
LANXESS pursuing sustainability as strategic goal in all dimensions

We consider sustainability as competitive advantage and license to operate

Powerful societal drivers are changing the face of the chemical industry

<table>
<thead>
<tr>
<th>Climate</th>
<th>Sustainable Development Goals (SDG): Most comprehensive global sustainability framework</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circular Economy</td>
<td>Financial investments to be directed towards low carbon projects and circular economy (e.g. EU Sustainable Finance Action Plan)</td>
</tr>
<tr>
<td>Sustainable Finance</td>
<td>Develop new resource neutral production pathways, reduce resource consumption and achieve climate targets</td>
</tr>
</tbody>
</table>

EU/World committed to keeping worldwide temperature increase “well below 2 degrees” in the Paris Agreement
LANXESS’ Corporate Responsibility creates alignment with societal drivers for greater sustainability

U.N. Sustainable Development Goals

Corporate Responsibility

Climate protection and energy efficiency  Safe and sustainable sites  Resilient sourcing  Sustainable product portfolio  Valuing customer relations  Business-driven innovation  Motivated employees and performing teams

Good Corporate Governance

LANXESS is a leading, resilient, sustainable, and profitable company

We defined ambitious non-financial targets and are dedicated to a consequent execution

Alignment with SDG

Healthy living and well-being as key issues in manufacture and use of LANXESS products (e.g. „X-health“ initiative)
LANXESS fosters qualification and training of employees and engages in the education initiatives at its sites globally
LANXESS produces products and technologies for water purification and regular water analyses and assessments
High and uniform standards  Xact initiative aims to decrease the LTIFR* by >50% until 2025 vs. 2015)
LANXESS supports pathways towards a more resource- and energy-efficient production and sustainable products
LANXESS is serious about climate protection  LANXESS will be climate neutral until 2040

Non-financial targets

-25% Energy consumption and emissions until 2025**
Climate neutral until 2040
Continuous reduction of incidents relating to facility & process safety
Permanently increase the proportion of evaluated suppliers
100% of our portfolio analyzed from a sustainability perspective
Maintaining a high level of customer loyalty
Innovative products based on customers’ needs & expectations
At least one female member of the Board of Management by 2022

*LTIFR: Lost time injury frequency rate  **Specific emissions, base year 2015
LANXESS goes climate neutral with higher target setting and new long-term commitment

Clear climate roadmap to reduce emissions

<table>
<thead>
<tr>
<th>Year</th>
<th>CO₂e scope 1+2 emissions in kt, LANXESS¹</th>
<th>Climate neutral²</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>~6,500</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>3,200</td>
<td></td>
</tr>
<tr>
<td>2025e</td>
<td>2,400</td>
<td>-50%</td>
</tr>
<tr>
<td>2030e</td>
<td>1,600</td>
<td></td>
</tr>
<tr>
<td>2040e</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Strong ambition for climate neutrality by 2040
- Clear defined projects to reach ambitious reduction of further 50% by 2030
- Majority of projects with attractive business case
- Growth to be compensated with efficiency measures
- Sustainability targets to be incorporated into top management remuneration

Good for LANXESS, good for our customers, good for our planet!

LANXESS is ahead of regulation and far sighted in Emission Trading Scheme (ETS) certificates

Climate performance*  

管理 of certificates

- LANXESS actively reduced CO₂e emissions in line with Emission Trading Scheme (ETS) reduction targets
- Cost effect from ETS is currently neutral
- LANXESS will continue to reduce CO₂e emissions and remain ahead of ETS reduction targets

*= Existing business parameters, in case of significant M&A timeline to be adjusted. ²CO₂e in CO₂e emissions p.a.

*Reduction of scope 1 and scope 2 GHG emissions. Performance calculated versus 2004 level (foundation of LANXESS); performance compared to 1990 level even higher (-65%), but not fully in our responsibility due to pre-spin off setup. Trajectory based on BDI, Afghanistan Kraft Deutschland. Existing business parameters, in case of significant M&A timelines to be adjusted.
We pursue an integrated approach for sustainable production, sourcing and product portfolio

**Safe and sustainable sites**
- Continuous reduction of incidents relating to facility & process safety
  - Centrally organized management system and regular audit-based reviews
  - Actions based on international standards ISO 9001 and ISO 14001 for quality and environmental management

**Resilient sourcing**
- Continuously increase the proportion of evaluated suppliers
  - Together for Sustainability: Joint initiative of international chemical companies for sustainable supply chains
  - LANXESS Xcore – new “radar screen” for strategic buying processes in cooperation with Ecovadis as assessment partner

**Sustainable product portfolio**
- 100% of our portfolio analyzed from a sustainability perspective
  - Systematically evaluating the sustainability of our entire portfolio applying sustainability criteria in the development of products and applications
  - Commitment to “Plastics 2030” and “Operation Clean Sweep” initiatives to prevent leakage of plastics into the environment

LANXESS’ Performance Culture creates value for our customers and drives our ideas forward

**Valuing customer relations**
- Maintaining a high level of customer loyalty
  - Close customer relationships advance product- and application-oriented innovation
  - Retention index (RI or also customer loyalty index)* as central KPI to measure the intensity of the customer loyalty
  - Each business unit conducts an anonymous online survey every two years

**Business-driven innovation**
- Innovative products based on customers’ needs & expectations
  - Electric vehicles: Thermoplastic with high mechanical strength and insulation properties for technical applications e.g. high-voltage batteries in electric vehicles
  - Organic preservatives: Unique natural preservative for beverage protection
  - Custom manufacturing: Development of customized ingredients for individual customers

**Motivated employees and performing teams**
- At least one female member of the Board of Management by 2022
  - LANXESS’ success is driven by the personal commitment of each employee against the backdrop of a corporate culture and a clear compass of values
  - Initiatives on health, safety, well-being, diversity, flexibility, and appropriate working models
  - Comprehensive concepts for employee qualification and training

* Evaluation of different performance criteria, standardized on a scale of 1-100
Corporate Governance embodied in appropriate values, guidelines and organizational structures

Good Corporate Governance

Compliance
- Compliance Management System
- Code of Conduct

Committees & functions
- Compliance organization
- Corporate Risk Committee
- Corporate Responsibility Committee
- HSEQ Committee

Guidelines & regulations
- Corporate Policy
- Compliance Code
- Group directive

Integrated management system
- Internal control management system
- Risk management system
- Global standards

Commitment to international standards
- U.N. Global Compact
- Responsible Care®
- International Labor Organization (U.N.)

Tax policy
- Taxation based on LANXESS'
  - Corporate Compliance Codex
  - Code of Business Conduct

LANXESS’ Supervisory Board is independent, skilled, and balanced regarding its competences

Independence
All members of the Supervisory Board are independent

Diversity
>30% of the members of the Supervisory Board are women

Competence Profile
Defined competence profile ensures in-depth specialist knowledge and experience in 13 fields:
chemical industry, international management, corporate governance/compliance, strategy, M&A, production, marketing & sale of chemical products, procurement of raw materials, energy & services, HR/codetermination, investor relations, corporate financing, accounting and auditing, risk management and IT/digitalization
The Supervisory Board fulfills currently these goals and completes the competence profile

Attendance
Individual disclosure of attendance at meetings every year
No member of the Supervisory Board attended fewer than 80% in 2018

Tenure
No more than three full terms of office (maximum of 15 years)

Age Limit
Supervisory Board members shall not continue to serve after the end of the Stockholders’ Meeting following their 80th birthday

With regard to upcoming changes in law, LANXESS will consider and, if necessary, adjust aspects accordingly
LANXESS incentivizes the Board of Management appropriately and with long-term orientation

<table>
<thead>
<tr>
<th>Fix</th>
<th>Annual base salary</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Fixed annual base salary</td>
</tr>
<tr>
<td></td>
<td>Compensation in kind (mainly tax value of perquisites)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Annual Performance Payment (APP)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Based on: Target for EBITDA pre exceptionals</td>
</tr>
<tr>
<td></td>
<td>Cap: 200% of individual budget</td>
</tr>
<tr>
<td></td>
<td>Deduction in case of serious safety and/or environmental problems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-Term Performance Bonus (LTPB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on: Individual APP target for 3 successive fiscal years</td>
</tr>
<tr>
<td>Set-up: 45% of fixed annual compensation (app target attainment of 100%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Long-Term Stock Performance Plan (LTSP)²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on: LANXESS stock performance vs. MSCI World Chemicals Index²</td>
</tr>
<tr>
<td>Set-up: 30% of individual target income (target attainment of 100%)</td>
</tr>
<tr>
<td>Vesting period: 4 years</td>
</tr>
<tr>
<td>Until 2017: Personal investment in LXS shares (5% of annual base salary)</td>
</tr>
<tr>
<td>Since 2018: Share performance rights plus Share Ownership Guidelines (investment in LXS shares: CEO 1.5x and board members 1x of base salary)</td>
</tr>
</tbody>
</table>

Further characteristics:
- Total compensation is capped
- “Claw-back” – Right to withhold or reclaim granted variable compensation

LANXESS energizes sustainability in its business, in its portfolio and in its culture

- Value driven culture
- Sustainability is a core strategy element
- Ambitious future target setting

Good for our business, good for the society
Awards in ratings and indices reflect LANXESS’ commitment and its high standards

Our commitment, our effort:

ISO  

UN Global Compact

Responsible Care

THE GLOBAL GOALS

Awards in ratings and indices:

Member DJSi World & Europe

Climascore A-

Index member

EcoVadis „Gold Recognition Level“
LANXESS is an important manufacturer of intermediates

Advanced Industrial Intermediates

- One of the world’s leading manufacturers of high-quality industrial intermediates such as benzene- and toluene-derivatives, amines, polyols, inorganics and organometallics
- Competitiveness through an integrated production network with resilient business in the agro and chemicals industries

Saltigo

- A leading supplier in the custom synthesis market, providing state of the art technologies and services to the agrochemicals and specialty chemicals industries
- Growth driven by strong foothold in agrochemical industry
Advanced Intermediates:
Financials demonstrate considerable business resilience

**Contribution to Group performance 2018***

- **31% of Sales**
- **35% of EBITDA**

**Sales by BU 2018***

**History of sales, capex and EBITDA (margin) 2007–2018**

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales [€ m]</th>
<th>EBITDA [€ m]</th>
<th>EBITDA margin [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1,481</td>
<td>179</td>
<td>11.3</td>
</tr>
<tr>
<td>2008</td>
<td>1,581</td>
<td>206</td>
<td>13.0</td>
</tr>
<tr>
<td>2009</td>
<td>1,265</td>
<td>143</td>
<td>12.1</td>
</tr>
<tr>
<td>2010</td>
<td>1,630</td>
<td>271</td>
<td>16.2</td>
</tr>
<tr>
<td>2011</td>
<td>1,786</td>
<td>283</td>
<td>15.6</td>
</tr>
<tr>
<td>2012</td>
<td>1,893</td>
<td>367</td>
<td>15.8</td>
</tr>
<tr>
<td>2013</td>
<td>1,858</td>
<td>383</td>
<td>16.0</td>
</tr>
<tr>
<td>2014</td>
<td>1,847</td>
<td>398</td>
<td>15.5</td>
</tr>
<tr>
<td>2015</td>
<td>1,826</td>
<td>326</td>
<td>17.0</td>
</tr>
<tr>
<td>2016</td>
<td>1,742</td>
<td>326</td>
<td>17.0</td>
</tr>
<tr>
<td>2017</td>
<td>1,975</td>
<td>339</td>
<td>16.3</td>
</tr>
<tr>
<td>2018</td>
<td>2,207</td>
<td>339</td>
<td>16.3</td>
</tr>
</tbody>
</table>

**Note:** All references to EBITDA are pre exceptions

**Operating segments**
Advanced Industrial Intermediates – One of the world’s leading suppliers of high-quality industrial chemicals

**Key facts**

- **Segment:** Advanced Intermediates
- **Sales:** >€1,000 m
- **Customers:** ~2,000
- **Products:** >200
- **Production:** 13 sites around the world
- **Employees:** ~2,500
- **Market position:** Leading positions in various intermediates markets
- **Business:** One of the world’s leading manufacturers of high quality industrial intermediates

**Sales by end use 2018**

- Automotive 21%
- Agro 19%
- Chemicals 17%
- Construction 9%
- Others 34%

**Sales by region 2018**

- EMEA 58%
- Americas 21%
- Asia-Pacific 21%

Advanced Industrial Intermediates: Providing chemical intermediates for a wide range of applications

**Aromatic Network**

- Main Intermediates
  - Chlorobenzenes
  - Chlorotoluenes
  - Cresols, d/l-Menthol
  - Nitrotoluenes
  - Toluines
  - Monochloroacetics
- Key Applications
  - Agrochemicals
  - Flavors & fragrances
  - High-tech plastics
  - Chemicals

**Benzy1 Products & Inorganic Acid**

- Main Intermediates
  - Amines
  - Benzylchlorides
  - Benzylalcohol
  - Benzaldehyde
  - Hydrofluoric acid
  - Hydrazine hydride
- Key Applications
  - Agrochemicals
  - Advanced polymers
  - Solvents
  - Flavors & fragrances
  - Batteries

**Polymers & Oxidation Products**

- Main Intermediates
  - Hexanediol
  - Trimethylolpropane
  - Adipic acid
  - Maleic anhydride
  - Phthalic anhydride
  - Calcium formate
- Key Applications
  - Polyester resins
  - Coatings
  - Plasticizers
  - Building material additives

**Antioxidants & Accelerators**

- Main Intermediates
  - Phenylendiamines
  - Quinolines
  - Thiazoles
  - Sulfenamides
  - Mercaptobenzimidazoles
  - Peptizer
- Key Applications
  - Tires
  - Technical rubber goods
  - Consumer goods
  - Fuel additives

**Organometallics**

- Main Intermediates
  - Aluminoxane Co-Catalyst components
  - Aluminoxane Activators
  - Silane Stabilizers
  - Diaryl Zn&Mg precursors
- Key Applications
  - Polyolefins, elastomers, Linear alpha olefins
  - Glass coating
  - Electronics (LED & PV)
  - Fine Chemicals
A global reach with sites in China, Germany, India and USA to serve worldwide demand

Advanced Industrial Intermediates:
Most competitive value chain

Use market and technological leadership ...

- Aromatic Network
- Benzyl Prod. & Inorganic Acids
- Polyols & Oxidation Products
- Antiox & Acc.
- Organo-metallics

LANXESS market share
>30% >20% >15%

Efficient, resilient, expandable

... on competitive production platform

- Raw materials
- Processes
- Products
- End markets

Chemicals market
- Unique integrated manufacturing network ("Verbund")
- Lean cost structure
Competitive advantage based on efficient production platform with integrated processes

Raw materials

Input
- Benzene
- Toluene
- Fluorspar
- Cyclohexane
- Aniline
- Metals

Efficient production platform

Basis for competitive advantages:
- Integrated, proprietary processes in right-scaled plants in an asset network structure ("Verbund")
- Acts as entry barriers
- Technology and production know-how
- Cost leadership

Diverse end market

Main applications
- Agriculture
- Flavor and fragrances
- Polymers
- Pigments/dyes
- Paints
- Automotive
- Tires
- Technical rubber goods
- Construction
- Glass coating
- Semiconductors
- Photovoltaic
- Batteries

Global industry-trends drive the growth of LANXESS’ high-quality intermediates

Market development

- Growth based on robust sustainable trends across diversified markets
- Chinese competition changing – more environmentally sustainable at higher costs
- Competitive position is strengthening through organic capacity growth

Demand growth* (CAGR 2017-2021)
- Global: ~3%
  - Asia-Pacific: ~6%
  - North America: ~3%
- EMEA: ~2%
  - Latin America: ~4%

Market environment

Supporting sustainable industry trends
- Feeding a growing population with additional needs: Population growth, urbanization and increasing standard of living drive demand for chemical intermediates
- Mobility and urbanization megatrends: All five Business Lines deliver key inputs for high-tech plastics, rubber manufacturing and coatings and resins
- Resource efficiency and regulatory environmental programs drive demand for chemical intermediates from sustainable manufacturing sources

Main competitors
- Yangnong, Sasol, Aarti, Honshu, Deepak, Tsaker, Panoli

*Source: Global Insight and LMC automotive; BU AII specific end use.
Advanced Industrial Intermediates – Well positioned to generate value in the global marketplace

- **Leadership positions**: One of the leading suppliers of Advanced Industrial Intermediates worldwide and leadership in Europe
- **Most competitive network**: Competitive technologies and world-scale production facilities operating at lowest cost due to most efficient “Verbund”-operations
- **Agile development**: Leading competence in managing a complex production network improving costs continuously
Saltigo – A leading custom manufacturing organization for the agro and fine chemicals market

Key facts

- **Segment:** Advanced Intermediates
- **Sales:** <€500 m
- **Customers:** Batch processes up to 5,000 t for ~150 customers*
- **Products:** >400
- **Production:** Unique production network with 10 plants in Dormagen & Leverkusen (GER)
- **Research:** World-class R&D center
- **Employees:** ~1,200
- **Market position:** One of the global leaders in agro custom manufacturing
- **Business:** Exclusive synthesis for active ingredients notably for the agro industry and specialty chemicals like Saltidin® (insect repellent)

*1 product = 1 customer for ~5 years

Sales by end use 2018

- Agro 80%
- Fine Chemical Intermediates 10%
- Pharma 10%

Sales by region 2018

- Americas 15%
- Asia-Pacific 5%
- EMEA 18%

Saltigo – Top brand in the industry, unique capabilities open new opportunities

Business type

- Fine Chemical Intermediates 10%
- Custom Manufacturing 90%

Custom Manufacturing

- Exclusive synthesis: 1 product = 1 customer
- High-value products
- Technology leadership in complex multi-step syntheses at almost any scale (10t/a up to 5,000t/a)
- World-class R&D center in Leverkusen to develop most efficient chemical processes

Fine Chemical Intermediates

- Special building blocks & products serving a variety of chemical industries, customers and applications
Saltigo has a unique, fully integrated production network in Germany

**Key features**

- All sites embedded in state of the art chemical parks
  - Utilities, waste water treatment, incineration
  - Synergies with LANXESS plants
- Unique, fully integrated production network
  - Multipurpose & technology specific plants
  - Very broad permits & chemistries
  - Process development & analytics on site

---

**Broad range of applications, focussing on fungicides**

**Project business & chemicals for various purposes**

<table>
<thead>
<tr>
<th>Agrochemicals</th>
<th>Non-Life Science Fine Chemicals</th>
<th>Pharmaceuticals &amp; Animal Health</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insecticides</td>
<td>Repellents</td>
<td>Heart Disease</td>
</tr>
<tr>
<td>Herbicides</td>
<td>Personal Care</td>
<td>Renal Care</td>
</tr>
<tr>
<td>Fungicides</td>
<td>Performance Chemicals</td>
<td>Anti-Thrombosis</td>
</tr>
<tr>
<td>Nematicides</td>
<td>Polymers</td>
<td>Anti-Mycotics</td>
</tr>
</tbody>
</table>

LANXESS – ENERGIZING CHEMISTRY

FINANCIALS

Advanced Intermediates | Specialty Additives | Performance Chemicals | Engineering Materials
029 Advanced Industrial Intermediates
033 Saltigo
Saltigo is the partner of choice for high complex specialties

Saltigo’s Value Chain offers the highest value to its customers

**Value added**

- Commodities
- Raw materials
- Simple intermediates
- Advanced intermediates
- Active ingredients
- Core Business
- Specialties

### Strong leadership fundament

- Saltigo focusses on high complex, high value-add specialties
- Saltigo’s key success factors as strong enablers
- Excellent chemical expertise
- Broad technology platform
- Integrated production network
- Value based partnership with the leading agro players in the market

Saltigo with thorough service offerings, covering crucial parts of the product value chain

<table>
<thead>
<tr>
<th>Raw Material</th>
<th>Advanced Intermediate</th>
<th>Active Substance</th>
<th>Formulation</th>
<th>End product</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idea</td>
<td>Lab</td>
<td>Process development</td>
<td>Pilotation</td>
<td>Production</td>
</tr>
<tr>
<td>Unique selling points</td>
<td>Process development capabilities are best in class within the industry</td>
<td>Fast ramp-up and short time to market</td>
<td>Ongoing process optimization and continuous improvements</td>
<td></td>
</tr>
</tbody>
</table>

Saltigo – Innovative leader in custom manufacturing
Saltigo’s broad technology base and its integrated production platform are key assets

**Sophisticated chemicals**
- Very broad permits, allowing (almost) all kinds of chemistries/reagents, including
  - Phosgene
  - Hydrazine
  - Ethylene oxide
  - Bromine
  - Hydrofluoric acid and halex fluorinations

**Flexible technology base**
- 10 plants – multipurpose, cGMP* or dedicated technologies, e.g. hydrogenations
- Versatile technology base with a broad equipment and material mix
- Complex syntheses in various scales

**Chemical park integration**
- All plants in fully integrated chemical parks
- Broad recycling capabilities and capacities
- Chemical park with waste water treatment, incineration plants and landfill on site

**Health, environment & safety**
- ISO 9001:2008, ISO 14001, ISO 50001 and OHSAS certified
- cGMP* certified
- Very high quality and safety standards
- MAQ <2 for many years

---

Clear focus on specialties and global industry trends foster sustainable growth

**Saltigo is well positioned in a sound market**
- Sustainably growing demand for high specialty agro chemicals
- Increasing focus on environmental sustainability in China putting pressure on Saltigo's competitors landscape
- Competitive position is strengthening through capacity growth
- Saltigo’s sound crop protection portfolio, with high focus on fungicides offering highest returns

**Market environment: Sustainable industry trends**
- Population growth and increasing meat consumption as main drivers for higher crop demand
- Urbanization – Mega cities are reducing arable land, thus requiring more efficient agrochemicals
- Globalization of travel contributes to spreading of insects
- Outsourcing is a vital trend in the life-science industry, also fueled by mergers of major agro companies

**Main competitors**
- Deccan
- Lianhe
- CABB

---

* cGMP = current Good Manufacturing Practice
Saltigo – Market leader with strong business set-up and sustainably growing end markets

<table>
<thead>
<tr>
<th>European leadership</th>
<th>#1 custom-manufacturer for agro specialties in Europe and a leading player globally</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specialized portfolio</td>
<td>Leading chemical and technical expertise for sophisticated ingredient manufacturing</td>
</tr>
<tr>
<td>Flexible technology</td>
<td>Unique fully integrated production network</td>
</tr>
<tr>
<td>Sustainable growth</td>
<td>Focus on chemical specialties in the agro and niche industries</td>
</tr>
<tr>
<td>Setting standards</td>
<td>Highest reliability and quality, safety and environmental standards in the synthesis of active ingredients</td>
</tr>
</tbody>
</table>
Specialty Additives: World class player in several highly attractive additives niches

- **Polymer Additives**
  - Polymer Additives offers a broad portfolio of brominated as well as phosphorus flame retardants, plasticizers and other products

- **Lubricant Additives**
  - Leading lubricants additives player with strong industrial focus and highly specialized and balanced portfolio to serve growing end markets

- **Rhein Chemie**
  - Solution provider for additives in rubber, plastics, construction and colorants applications
Additives are one of the most attractive market segments in the chemical space

Additives are high value added high service products

- Additives
- Process chemicals
- Formulations
- Fine chemicals
- Inorganic specialty materials

Demand for technical service

Product enhancement relative to share of customers’ costs

Increasing performance requirements drive growth above GDP

Attractive characteristics of additives business

- Small part of customers’ total costs
- Desired result is key for customer
- Knowledge and technical service intensive

Specialty Additives offers a higher than average profitability

Contribution to Group performance 2018*

<table>
<thead>
<tr>
<th></th>
<th>Sales 28% of</th>
<th>EBITDA 34% of</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales</td>
<td>EBITDA</td>
</tr>
<tr>
<td></td>
<td>2018</td>
<td>2018</td>
</tr>
<tr>
<td>BU PLA</td>
<td>841</td>
<td>1,360</td>
</tr>
<tr>
<td>BU LAB</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>BU RCH</td>
<td>1,011</td>
<td>1,980</td>
</tr>
</tbody>
</table>

History of sales, capex and EBITDA (margin) 2007–2018

Sales by BU 2018*

<table>
<thead>
<tr>
<th>BU PLA</th>
<th>BU LAB</th>
<th>BU RCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>841</td>
<td>N/A</td>
<td>1,011</td>
</tr>
<tr>
<td>1,360</td>
<td>N/A</td>
<td>1,980</td>
</tr>
</tbody>
</table>

Capex [€ m] 2007–2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Capex [€ m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>N/A</td>
</tr>
<tr>
<td>2008</td>
<td>N/A</td>
</tr>
<tr>
<td>2009</td>
<td>N/A</td>
</tr>
<tr>
<td>2010</td>
<td>N/A</td>
</tr>
<tr>
<td>2011</td>
<td>N/A</td>
</tr>
<tr>
<td>2012</td>
<td>N/A</td>
</tr>
<tr>
<td>2013</td>
<td>N/A</td>
</tr>
<tr>
<td>2014</td>
<td>N/A</td>
</tr>
<tr>
<td>2015</td>
<td>42</td>
</tr>
<tr>
<td>2016</td>
<td>83</td>
</tr>
<tr>
<td>2017</td>
<td>N/A</td>
</tr>
<tr>
<td>2018</td>
<td>141</td>
</tr>
</tbody>
</table>

Note: All references to EBITDA are pre exceptional; pro forma restatements with new BU structure in 2016; as of 21 April 2017 Chemtura’s additives business was consolidated.

* Operating segments
Lubricant Additives is a major global player in the attractive field of lubricants

**Overview**
- **Segment:** Specialty Additives
- **Sales:** €500–€1,000 m
- **Customers:** ~800 in more than 120 countries
- **Products:** ~660
- **Production:** 12 sites
- **Research:** 5 technical competence centers in North America, Europe and Asia
- **Employees:** ~800
- **Market position:** Among top 3 lubricant additives companies
- **Business:** Leading lubricants additives player with strong industrial focus and highly specialized and balanced portfolio to serve growing end markets

**Sales by end use 2018**
- Industrial Manufacturing 52%
- Automotive 19%
- Energy 13%
- Others 6%

**Sales by region 2018**
- Americas 53%
- EMEA 32%
- Asia-Pacific 15%

Lubricant Additives with strong focus on high value-add industrial lubricant solutions

**Well diversified and specialized lubricants portfolio**
- General Industry
- Specialities ~80%
- Automotive
- Commodities ~20%

**A leading specialties player**
- Highly diversified end-market split with focus on industrial lubricants
- Strong expertise in high value-add specialty lubricants
- Leading positions in mid-sized and niche markets
- Automotive exposure well balanced with additives and base stocks only for high grade specialty engine oils (highest category 4 & 5)
Lubricant Additives Business – Cutting edge integrated portfolio for lubricants

**Top line with comprehensive offering**
- Synthetic esters
- Phosphate esters
- Fire-resistant hydraulic fluids
- Refrigeration fluids
- Aerospace fluids
- High performance greases

**Unique business set-up**
- Unique integrated value chain with backward integration
- Strong complementary product portfolio with cross-selling potential
- Improved regional sales split offering additional potential for growth
- Striving for innovation and technology leadership across the entire portfolio

Lubricants Additives Business offers an integrated and specialized portfolio for lubricants

**Lubricant Additives – Extensive sector coverage**
**Key industries served**

- Aerospace
- Marine
- Automotive
- Power Generation
- General Industrial
- Off-Highway
- Refrigeration
Lubricant Additives –
A truly global player with close customer proximity

Headquarter: Shelton, CT, USA

Manufacturing:
- 12 production sites in 9 countries

Technical Competence Centers:
- Mannheim, Germany
- Nanjing, China
- Naugatuck, CT, USA
- Qingdao, China
- Manchester, UK

Regional Sales Hubs:
- Cologne, Germany
- Pittsburgh, PA, USA
- Shanghai, China

Lubricant Additives – Unique integrated value chain from basestocks to lubricant additives, packages and finished fluids

Product steps in lubricant market place

- Unique backward integration
- Strong complementary product portfolio with cross-selling potential
- Improved regional sales split offering additional potential for growth
- Striving for innovation and technology leadership
High-quality Additives and Lubricants designed for environmental awareness and regulation

**Wind turbines**
- System® high-viscosity polyalphaolefins (PAO) are used in gear oils for wind turbines, and in industrial and automotive applications
  - Green energy
  - Longer product life
  - Reduced maintenance costs

**Transportation**
- Naugluube® antioxidants enable longer lasting engine oil performance, maintaining engine life and efficiency
- Royco® aviation lubricants are produced to the highest standards and specification to ensure optimum in-flight performance, safety and efficiency

**Detergents**
- Lobase® and Hybase® detergents provide excellent detergency, low reactivity, corrosion protection and EP performance
- Enables lubricants to protect marine engines operating on varying quality fuels
- Magnesium sulfonate detergents help to reduce 'Low Speed Pre-Ignition' in passenger car engines

**Emissions and fuel economy**
- Additin® new organic metal-free friction modifier additive delivers significant friction reduction to improve engine fuel economy and reduce emissions
- hatcol® high performance synthetic esters help to reduce viscosity and internal friction in the engine resulting in higher fuel efficiency

**Industrial solutions**
- Additin® sulfur-based extreme pressure additives for metal working fluids help to replace chlorinated paraffins
- Reolube® Turbofluid 46B low toxicity, fire resistant hydraulic fluids for power plants designed to provide a safer alternative and comply with REACH regulations

**Greener cooling solutions**
- Everest® refrigeration lubricants designed to optimize performance, energy efficiency and service life of today’s low global warming potential (GWP) air conditioning systems
- hatcol® esters are a key base stock of refrigerant lubricants for these AC systems

Lubricant Additives growth is driven by energy efficiency and tighter regulations in higher growth segments

<table>
<thead>
<tr>
<th>Market drivers</th>
<th>Additive Demand*</th>
<th>Fin. Fluid Demand*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>2022</td>
<td>2017</td>
</tr>
<tr>
<td>Total</td>
<td>+1.1%</td>
<td>Total</td>
</tr>
<tr>
<td>Synthetics</td>
<td>+2.5%</td>
<td>Additives</td>
</tr>
<tr>
<td>Ind Additives</td>
<td>+1.5%</td>
<td>Additive</td>
</tr>
<tr>
<td>Total Additive</td>
<td>+4%</td>
<td></td>
</tr>
</tbody>
</table>

- New auto and industrial OEM specifications require energy efficient, long lasting performance (synthetics, antioxidants)
- Environmental regulations lead to safer alternatives; e.g. ban of chlorinated paraffins in MWFs raise demand for Extreme Pressure (sulfur carriers)
- Aviation and refrigeration finished fluids show strong growth correlating with increasing urbanization and standards of living

**Market environment**

<table>
<thead>
<tr>
<th>Shift to synthetics</th>
<th>Synthetics Share of Global Lubricants*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage of lubricants based on synthetic basestocks (e.g. PAOs, esters) has increased from 10% in 2009 to 21% in 2018*</td>
<td>2009 2018</td>
</tr>
<tr>
<td>25%</td>
<td>20%</td>
</tr>
<tr>
<td>20%</td>
<td>15%</td>
</tr>
<tr>
<td>15%</td>
<td>10%</td>
</tr>
<tr>
<td>10%</td>
<td>5%</td>
</tr>
<tr>
<td>5%</td>
<td>0%</td>
</tr>
</tbody>
</table>

**Main competitors**
- CRODA (basestocks)
- Lubrizol, Afton
- King Industries (additives)
- Lubrizol, Afton (packages)
- CPI, Chemtool (finished fluids)
Leading technology player with unique integrated value chain and focus on specialties

**Unique value chain**
Unique fully integrated value chain with backward integration into basestocks

**Leading Technology**
Technology, Innovation and Safety Expertise in critical industries bring solution to meet complex technical challenges

**Focus on specialties**
Highly-specialised additives that benefit from regulatory trend towards high performance additives solutions

**Attractive Growth**
Clear trends towards higher regulation and better product performance drives growth for specialties
Polymer Additives is a major global player in end markets

Overview
- Segment: Specialty Additives
- Sales: €500 – €1,000 m
- Customers: ~1,200 in more than 120 countries
- Products: ~350
- Production: 8 sites in 4 countries
- Research: 6 technical competence center in North America, Europe and Asia
- Employees: ~900
- Market position: Among top 1–3 additives companies
- Business: Polymer Additives offers a broad portfolio of brominated as well as phosphorus flame retardants, plasticizers and other products

Sales by end use 2018
- Ind. Manufacturing: 24%
- Energy: 6%
- Transportation: 12%
- Construction: 17%
- Other: 17%

Sales by region 2018
- Asia-Pacific: 27%
- Americas: 35%
- EMEA: 38%

Four business lines with a strong complementary portfolio and a strategic focus on specialties

Brominated Flame retardants
- Brominated flame retardants
- Firemaster®, Emerald Innovation®

End markets
- Electronics
- Insulations for the building industry
- Textiles

Bromine Performance Products
- Bromine
- Fine Chemicals and intermediates
- Clear Brine Fluids
- Geobrom®, Meth-O-Gas®

End markets
- Chemical and pharmaceuticals
- Oil and Gas

Plastics Additives
- Phosphorus flame retardants
- Plasticizers
- Hydrolysis protection
- Other plastic additives
- Mesamoll®, Adimoll®, Ultramoll®, Mersolat®, Driftmoll®, Levagard®, Stabaxol®, Reofos®

End markets
- Construction
- Automotive
- General plastics

Specialties and Intermediates
- Phosphorus chemicals
- Water treatment products
- Other intermediates and specialties
- Bayhild®, Bayspure®, Baysolvex®, Mersolat®

End markets
- Agro chemicals
- Water treatment
Polymer Additives – A truly global player with close customer proximity

**Headquarter:** Cologne, Germany

**Global production footprint:**
- 8 production sites in 4 countries

**Global technical competence center network:**
- Leverkusen, Germany
- Mannheim, Germany
- Trafford Park, UK
- Naugatuck, CT & El Dorado, AR, USA
- Qingdao & Nanjing China

**Strong commercial presence:**
- Cologne, Germany
- Pittsburgh, PA, USA
- Shanghai, China

Polymer additives provide indispensable solutions for modern life

### Flame retardants
- Fire safety requirements: 1) Prevent fire 2) Generate as little smoke as possible and delay the fire from spreading

**LANXESS products offer highly-efficient fire protection paired with other advantages like easy processability or high elasticity**

- Disflamoll®, Reofos®, Levagard®, Firemaster®, Emerald Innovation®

### Safe for toys and food contact
- Plasticizer solutions that are safe in human contact or food

**We offer plasticizing solutions for a broad range of specialty applications, e.g.:**
- Toys
- Products in contact with aqueous based foodstuffs
- Human contact, e.g. gloves, swimming floats, film for water beds
- Sealants and casting compounds for the construction sector

**Mesamoll® II is suitable for a large number of demanding applications**

### Giving plastics longer life
- Products made from plastics and polyurethane wear extremely fast on contact with water or acids

**LANXESS’ stabilizers extend the lifespan of products by up to three fold. Only this prolonged service life allows the use of these materials in critical applications**

**Stabaxol® works effectively against hydrolysis in a wide range of polymers**
Bromine derivatives –
Extracting value from bromine by pursuing the whole value chain

Bromine reserves

Elemental bromine

Bromine derivatives

End use

Bromine well, El Dorado, Arkansas, USA
Reserves for >70 years

Chlorine and steam

Elemental bromine production El Dorado, Arkansas, USA

Flame retardants

Sodium-calcium bromides

HBr/alkyl bromides

Construction

Biocides

Agro

EAE

Flame Retardants (FR) market structure

- Brominated and phosphorous Flame Retardants represent 46% of total market
- ATO¹ ATH², and chlorinated FR are either under increasing regulatory scrutiny or lack attractive market conditions

*Antimony trioxide, ²Aluminum trihydroxide. Other FR include nitrogen-based, silicon-based, magnesium-based FR, borates, graphite and others – Chemistries that are not available in our current asset production setup.
Source: Frost & Sullivan, Global Flame Retardants Market, July 2019

LANXESS – ENERGIZING CHEMISTRY

LANXESS Fact Book 2019
Polymer Additives well prepared for upcoming regulatory changes in APAC: Strategic focus on developing sustainable FRs

Polymer Additives growth is driven by enforcement of regulations and market growth in APAC

Market development

Bromine derivatives demand growth* (CAGR 2017–2022)

Flame retardant demand growth* (CAGR 2017–2022)

Market environment

Supporting industry trends

- Consolidation of Chinese bromine manufacturers and depletion of domestic bromine supply in China
- Increased EHS regulation is putting pressure on Chinese producers since 2015

Main competitors

- ICL
- Albemarle
- Italmatch
- Wansheng
- Yoke

* IHS 2017 Flame retardants, IHS 2017 Bromine

- Increased bromine logistical capabilities and new product developments will drive growth over the coming years
- Sustainable flame retardants favored by regulatory trends:
  - LANXESS is pushing polymeric Flame Retardant Emerald 3000 in APAC
  - LANXESS is developing new sustainable flame retardants

LANXESS: Ideal portfolio set-up

- Increased sensitivity regarding toxicity and persistence (bioavailability)
- Tightening regulations impacting choice of FR technology
- Current regulations focusing on small-molecule compounds due to higher leaching risks
- Market gradually moving to longer chain and polymeric and reactive compounds

LANXESS focusses on polymeric and reactive Flame Retardants to reduce toxicity and leaching risk

Illustrative on brominated Flame Retardants (BFR)

Market acceptance

Technology development

Market today

Polymeric + Reactive BFR

Oligomeric BFR

Monomeric BFR**

Substitution pressure

LANXESS focus

APAC growth (2021)*

LANXESS: Fact Book 2019

LANXESS – ENERGIZING CHEMISTRY

BUSINESS SEGMENTS

Advanced Intermediates | Specialty Additives | Performance Chemicals | Engineering Materials

FINANCIALS

040 Lubricant Additives
045 Polymer Additives
050 Rhein Chemie

LANXESS – ENERGIZING CHEMISTRY

BUSINESS SEGMENTS

LANXESS – ENERGIZING CHEMISTRY

040 Lubricant Additives
045 Polymer Additives
050 Rhein Chemie

LANXESS – ENERGIZING CHEMISTRY

FINANCIALS

Lubricant Additives
Polymer Additives
Rhein Chemie

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LANXESS – ENERGIZING CHEMISTRY

FINANCIALS
A leading player and innovation driver for phosphorus and bromine based chemistry

<table>
<thead>
<tr>
<th>Focus on specialities</th>
<th>High-performance additives for a broad range of industries and applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation leadership</td>
<td>Technology, regulatory and safety expertise at its best</td>
</tr>
<tr>
<td>Attractive growth</td>
<td>Highly-specialized additives that benefit from regulatory trend towards sustainable “green” chemistry</td>
</tr>
<tr>
<td>Strong value chains</td>
<td>Attractive business set-up based on backward integration and long-term supply contracts</td>
</tr>
</tbody>
</table>
Rhein Chemie: Highest quality for additives and solutions to a variety of industries

**Key facts**
- **Segment:** Specialty Additives
- **Sales:** €500 m
- **Customers:** ~3,000 in more than 120 countries
- **Products:** >2,000
- **Production:** 10 sites
- **Research:** World-class R&D center in Germany; 7 application development centers globally
- **Employees:** ~1,000
- **Market position:** Leading market position in main businesses
- **Business:** Solution provider for additives in rubber, plastics, construction and colorants applications

**Sales by end use 2018**
- Tires 33%
- Automotive 22%
- Electronics 5%
- Chemicals 6%
- Plastics 9%
- Others 25%

**Sales by region 2018**
- Americas 24%
- Asia-Pacific 34%
- EMEA 42%

Focus on technical solutions for attractive end markets with well-known branded products

**Rubber Additives Business**
- Polymer-bound additives (Rhenogran®)
- High-performance bladders (Rhenoshape®)
- Release agents (Rhenodiv®)
- Tread marking paints (Rhenomark®)
- Processing promoters (Aktiplast®, Aflux®)
- Functional additives (Rhenofit®, Cohedur®)
- Zinc oxide (Bayoxide®, Zinkoxid aktiv®)

**Colorant Additives Business**
- Solvent dyes for the coloration of plastics (Macrolex®)
- Organic pigments for LCD color filter (Levascreen®)
- Pigments for automotive coating (Bayfast®) and plastics (Bayplast®)
- Organic- (Levanyl®) and inorganic- (Levanox®) pigment preparations
- High quality colorants for inks (Bayscript®)
Worldwide competence & customer proximity

**Headquarter:** Mannheim, Germany

**Production sites**
- 12 production sites in 8 countries

**Technical competence centers**
- 7 Technical competence centers in Argentina, China, Germany, India, Japan and USA

**Sales offices**
- Worldwide sales offices of LANXESS and local distributors

---

Colorant Additives Business provides solutions to a broad variety of applications and industries

**Value chain**

<table>
<thead>
<tr>
<th>Raw materials</th>
<th>LANXESS products</th>
<th>Customers</th>
<th>End applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical intermediates</td>
<td>Organic pigment*</td>
<td>Mill based Resist ink Color filter</td>
<td>Panel</td>
</tr>
<tr>
<td>~250 raw materials</td>
<td>Organic pigment (synthesis) Organic pigment (finishing)</td>
<td>Compounding Formulation Pigment preparation Formulations</td>
<td>Plastics Car finish Coating/crop science</td>
</tr>
<tr>
<td></td>
<td>Solvent dyes (synthesis) Solvent dyes (finishing)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Specialty colors (synthesis)</td>
<td>Compounding Formulation Ink formulations</td>
<td>Plastics Paper Ink system</td>
</tr>
</tbody>
</table>

* Only pigment yellow 130
Broad portfolio of rubber additives from pre-dispersed and functional additives to process aids and auxiliaries

Supporting global trends of our customers:
- Health and safety and environment
  - by making the production process cleaner
  - by making the production process more efficient
  - by supporting safer and greener finished goods
- Mobility by supplying solutions to enhance rolling resistance, wet-grip and wear resistance of tires

Rhein Chemie has a leading market position in its main business segments

Market development

**Autotive market**

<table>
<thead>
<tr>
<th>Year</th>
<th>APAC</th>
<th>EMEA</th>
<th>LATAM</th>
<th>NAFTA</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>2.5%</td>
<td>3%</td>
<td>2%</td>
<td>-1%</td>
<td>~2.5%</td>
</tr>
</tbody>
</table>

Market development (CAGR 2017-2022)
- Global: ~2.5%
  - Asia-Pacific: ~3%
  - EMEA: ~2%
  - Latin America: ~5%
BU RCH global total demand: ~€2.5 bn
Average demand growth of ~3% mainly driven by automotive and tire industry; some specialties with higher growth rates

Market environment

Supporting industry trends
- Rhein Chemie’s growth in tires and automotive applications is driven by the megatrend mobility
- Key applications (plastics, electronics, printing inks) with continuously strong growth rates
- Tightening regulatory standards allow Rhein Chemie to benefit from its leading compliance organization and performance
- Stricter enforcement of environmental standards in developing countries (e.g. China and India) resulting in market consolidation

Main competitors
- Chemtrend
- MLPC/Arkema Group
- Ningbo Longxin
Rhein Chemie stands for highest quality in additives and solutions to a variety of industries

| Leading in niches | World's leading provider of specialty additives for niche applications under the well-known Rhein Chemie brand |
| Tailored solutions | Leading competence in developing tailored solutions for customer products & processes |
| Innovation driver | High quality dyes combined with innovative manufacturing technology as competitive advantage |
| Leading quality | Quality as key principle in all our operations |
| Global production | High customer proximity with presence in all key markets |
Performance Chemicals: Production of application-focused chemicals for a wide range of industries

Inorganic Pigments
- A leading global supplier of inorganic pigments for the coloring of construction materials, coatings, plastics and for technical applications

Leather
- Supplier with a complete range of products for leather processing (tanning agents, preservatives, finishing auxiliaries, dye products)

Material Protection Prod.
- Wide range of microbial control products for construction and paints, beverages, industrial use and wood protection

Liquid Purification Technol.
- One of the leading global producers of ion exchange resins, adsorbents, functional polymers and reverse osmosis membranes for the treatment and purification of water and other liquids
Performance Chemicals: Specialty chemicals for niche markets

Contribution to Group performance 2018*  
19% of Sales 18% of EBITDA

Sales by BU 2018*

<table>
<thead>
<tr>
<th>Contribution</th>
<th>Sales</th>
<th>EBITDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>BU LEA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BU IPG</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BU MPP</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BU LPT</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

History of sales, capex and EBITDA (margin) 2007–2018

<table>
<thead>
<tr>
<th>Year</th>
<th>Sales [€ m]</th>
<th>Capex [€ m]</th>
<th>EBITDA [€ m]</th>
<th>EBITDA margin [%]</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>1,620</td>
<td>189</td>
<td>139</td>
<td>8.6</td>
</tr>
<tr>
<td>2008</td>
<td>1,595</td>
<td>188</td>
<td>139</td>
<td>8.6</td>
</tr>
<tr>
<td>2009</td>
<td>1,369</td>
<td>197</td>
<td>134</td>
<td>9.8</td>
</tr>
<tr>
<td>2010</td>
<td>1,789</td>
<td>206</td>
<td>136</td>
<td>7.6</td>
</tr>
<tr>
<td>2011</td>
<td>1,912</td>
<td>213</td>
<td>137</td>
<td>7.6</td>
</tr>
<tr>
<td>2012</td>
<td>2,085</td>
<td>221</td>
<td>136</td>
<td>6.6</td>
</tr>
<tr>
<td>2013</td>
<td>1,933</td>
<td>228</td>
<td>136</td>
<td>7.0</td>
</tr>
<tr>
<td>2014</td>
<td>1,897</td>
<td>235</td>
<td>141</td>
<td>7.5</td>
</tr>
<tr>
<td>2015</td>
<td>1,514</td>
<td>242</td>
<td>134</td>
<td>8.9</td>
</tr>
<tr>
<td>2016</td>
<td>1,439</td>
<td>248</td>
<td>134</td>
<td>9.4</td>
</tr>
<tr>
<td>2017</td>
<td>1,349</td>
<td>255</td>
<td>135</td>
<td>9.9</td>
</tr>
<tr>
<td>2018</td>
<td>1,349</td>
<td>187</td>
<td>139</td>
<td>10.3</td>
</tr>
</tbody>
</table>

Note: All references to EBITDA are pro forma restatements for new BU structure for 2016.
As of 21 April 2017 BU Rheinchemie Additives left the Performance Chemicals segment to form part of the Specialty Additives segment.
* Operating segments.
Inorganic Pigments – Iron oxide market leader serving diverse applications in a global market

**Key facts**

- **Segment:** Performance Chemicals
- **Sales:** <$500 m
- **Customers:** ~3,000
- **Products:** ~1,100
- **Production:** Production sites on five continents with a capacity of ~370,000 t/a
- **Employees:** ~1,500
- **Market position:** Globally leading position in iron oxide pigment production and all target industries
- **Business:** Leading manufacturer of inorganic iron oxide pigments with ~370,000 tons of own synthesis production capacity ensure a reliable global supply. Over 100 color shades in various delivery forms

**Sales by end use 2018**

- Construction 43%
- Plastics 10%
- Paints & Coatings 27%
- Paper 4%
- Others 16%

**Sales by region 2018**

- EMEA 48%
- Asia-Pacific 22%
- Americas 30%
- Others 16%

Pigment market can be divided in Organic and Inorganic Pigments

### Segmentation of pigment market

**Inorganic Pigments**

- Market dominated by Titanium Dioxide
- Main applications: Coloring (Paints and Coatings, Construction, Plastics) and technical applications (Water purification, Catalysts, Brake linings)
- Wide range coloring (black, white, red, blue, green etc.) with more natural color shades
- Outstanding light and heat stability

**Organic Pigments**

- Main product groups: Azo, Phthalocyanine and various High Performance Pigments
- Main applications: Printing Inks, Coatings and Plastics
- Brilliant colors with high tinting strength and wide color range
- Low light and heat stability

*Source: Internal analysis; split estimation based on market values*
IPG focusing on Synthetic Iron Oxide and Chromium Oxide Pigments and supplying high quality color and technical applications

Segmentation of pigment market

Inorganic Pigments

- Main product groups: Titanium Dioxide, Effect Pigments, Carbon Black and Iron oxides
- IPG Focus
  - Synthetic Iron Oxide pigments
  - Synthetic Chrome Oxide pigments

Color

- Wide range coloring (black, white, red, blue, green etc.) with more natural color shades
- IPG Focus
  - Earth tones: Red, Yellow, Black + Blends
  - Green

Applications

- Coloring: Construction, Paints, Coatings, Paper, Plastics, Printing Inks
- Technical applications: Water purification, Toner, Catalysts, Rubber, Brake linings etc.

Inorganic pigments are used in coloring and various technical applications

Products and brands

- Iron oxide pigments (red, yellow, brown, black)
- Chromium oxide pigments (green)
- LANXESS IPG main brands:
  - BAYFEROX®
  - COLORTHERM
  - Bayoxide®
Inorganic Pigments – A truly global player with synthesis plants and blending sites around the world

**Global asset network**

- Production sites on five continents
- Global production capacity of ~370,000 tons
- Krefeld-Uerdingen is the heart of the LANXESS pigments business with over 90 years of experience in iron oxide pigment production
- Continuous investments into capacity expansions and advanced technologies
- Globally leading environmental standards as competitive edge

![Global asset network diagram]

Inorganic Pigments covers the full value chain of iron oxide pigments production

<table>
<thead>
<tr>
<th>Synthesis</th>
<th>Sieving &amp; washing</th>
<th>Drying /calcination</th>
<th>Blending /milling</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laux process*</td>
<td>Thickening and washing</td>
<td>Drying and/or calcination</td>
<td>Color adjustment and milling</td>
<td>Packaging</td>
</tr>
<tr>
<td>Precipitation process</td>
<td></td>
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<td></td>
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<tr>
<td>Penniman process</td>
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<tr>
<td>Ningbo process*</td>
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</tbody>
</table>

Integrated synthesis and blending sites

Blending only sites
Global synthesis production network ensures supply security

- World’s largest production site for iron oxide pigments
- Capacity increase for micronized red pigments by approx. 5,000 t/a in 2018 through targeted debottlenecking
- Capacity increase for black pigments by 13,000 t/a completed; further colors in progress
- Leverage economies of scale with German production backbone

- Ongoing investments in new technology and process optimization
- Additional capacity expansion of high-quality yellow iron oxide pigments by 2,000 t/a has been completed in 2019
- Continuous investments in sustainable production, e.g., Cogen-plant

- Most modern production plant for iron oxide red pigments in Asia
- Located in Ningbo Petrochemical Economic & Technology Development zone – which is a national level chemical park ranked as top 3 in China
- State-of-the-art and sustainable pigment production is ensured by the use of innovative waste water and off-gas treatment

Awarded National Green Plant status – LANXESS set a new benchmark for iron oxide production in China

The Ningbo Process® is the greenest way to produce red iron oxides in the whole of Asia

- LANXESS is the only iron oxide producer to have received the National Green Plant certificate from the Chinese government
- The Ningbo Process® technology measurably minimizes the products environmental footprint*
- ~100% waste gas removal and waste water treatment is ensured

---

*All figures are based on internal studies: LANXESS' Ningbo Process® technology is compared with the traditional Chinese Penniman Red production process which does not include additional waste water and waste gas treatment.

**Laughing gas emissions equivalent to the annual CO2 per capita output of ~1,000,000 Chinese citizens could be saved if only the Ningbo Process® would be used for red iron oxide production in China.
Product innovation: Inorganic Pigments is technology leader in the field of iron oxides and chromium oxides

Different materials used for 3D Printing need universally applicable pigments with high performance in terms of heat stability and dispersibility. Iron oxides from LANXESS bring color to future technologies like 3D Printing.

Iron oxide used as raw material for the manufacture of LiFePO4 as cathode material for batteries in e-mobility applications.

Bayferrox® 303 T provides higher solar reflectance than regular black pigments. Up to 20% more reflected infrared radiation leads to significantly lower roof tile’s surface temperature.

Urbanization and increased sustainability awareness drive demand for Inorganic Pigments

Market development

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<tbody>
<tr>
<td>APAC</td>
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</tr>
<tr>
<td>EMEA</td>
<td></td>
<td></td>
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<tr>
<td>Americas</td>
<td></td>
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</tbody>
</table>

Demand growth (CAGR 2018-2021)

- Global: ~2%
  - Asia-Pacific: ~2%
  - EMEA: ~1%
  - Americas: ~1%

Source: LANXESS volume estimates

Market environment

Supporting industry trends

- Urbanization and increasing demand for pigments in emerging markets (e.g. India)
- Consolidation among Chinese iron oxide producers due to stricter enforcement of environmental laws
- General global trend towards quality products in all application fields

Main competitors

- Venator
- Ferro
- Selected Chinese players: Cathay, Deqing, Yixing
Inorganic Pigments is the largest producer globally with leading environmental standards

**Capacity Landscape 2005**

- Iron Oxide Market dominated by LANXESS IPG and other western players
- High amount of Chinese suppliers with fragmented capacity
- Heterogeneous competitor landscape

**Capacity Landscape 2019**

- Consolidation in the western industry has taken place (Elementis, Rockwood consolidated into Venator)
- Chinese fragmented supplier started consolidation process with new mid-sized players emerging, which have cope with stronger international standards
- North America with negligible capacity in 2019

Inorganic Pigments – Market leader shaping the iron oxide market

- **Market leader**
  - Leading global market position and by far largest state-of-the-art production network

- **Broader portfolio**
  - High-quality pigment portfolio covering full range of colors, supply forms and applications

- **Strongest brands**
  - Strong and well-established brands: Bayferrox® synonymous with iron oxides in many markets

- **Most competitive production**
  - Biggest world-scale plant including all relevant production process competencies with the only global footprint
Leather: One of the world’s leading organic leather chemical producers

Key facts
- Segment: Performance Chemicals
- Sales: <€500 m
- Customers: >1,000
- Products: >600
- Production: 6 sites
- Research: 13 service centers
- Employees: ~1,300
- Market position: Global #2 in leather chemicals
- Business: One of the world’s leading suppliers of leather chemicals

Sales by end use 2018
- Automotive Leather 39%
- Chemicals 9%
- Steel & Metal 21%
- Shoe Leather 24%

Sales by region 2018
- Asia Pacific 51%
- North America 13%
- EMEA 28%
- South America 8%

Offering the complete product range for leather processing and chrome chemicals

Business Line Organic Leather Chemicals
- High-quality products and services for all stages of the leather production process, one-stop-shop supplier in the market
- Global technical on-site support
- Application development, technical service and innovations significantly contributing to value creation
- Additional business platform “Functional Coatings”: high performance coating systems for various non-leather substrates

Business Line Chrome
- Leading producer of the key intermediate sodium dichromate (SDC), which is converted into chrome chemicals for leather and various non-leather applications
- Operational excellence along the chrome chemicals value chain & highest HSEQ standards
- Superior quality of SDC and downstream chrome chemicals CTS (chrome tanning salts) and CA (chromic acid)
Leather offers the complete product range for leather processing and selected chrome products

**Products and brands**

**Leather chemicals**
- Preservatives
- Beamhouse chemicals
- Chrome-free tanning agents
- Retanning chemicals
- Binders
- Colorants
- Fatliquors
- Finishing auxiliaries
- Patent leather chemicals

**Chrome products**
- Chrome ore
- Sodium dichromate
- Chrome tanning salts
- Chromic acid
- Chrome oxide

**Applications**

Leather has a global production and service network close to major markets

**Global set-up of BU LEA**

- Global production network to serve worldwide demand
  - BL OLC production sites:
    - Leverkusen (Germany), Changzhou (China), Filago (Italy)
  - BL CR production sites*:
    - Rustenburg chrome ore mine (South Africa), Newcastle (South Africa), Merebank (South Africa)
- Strong presence in faster growing Asian and BRICS markets
- Global sales force team and strong distribution networks taking care of customers worldwide
- Well trained and experienced technical support
- Technical centers in all major markets

* Chrome chemicals production in Zarate (Argentina) was closed by end of 2017
Leather: Complete product range for leather processing and excellent technical service

LANXESS leather value chain for Organic Leather Chemicals

From raw hide…

Preparation & tanning
through wet blue or wet white

Crusting
… and crust …

Finishing
to finished leather

Beamhouse chemicals
Tanning agents

Dyestuffs
Dyeing auxiliaries
Re-tanning agents
Softening agents

Binders
Colorants
Finishing auxiliaries
Special applications auxiliaries

Process steps with demand for leather chemicals

LANXESS leather activities

Chrome: Integrated value chain in South Africa from chrome ore to chrome chemicals production

LANXESS chrome value chain

Non-leather applications

- Ferrochrome/
  Stainless Steel
- Foundry sand
- Metal finishing
- Construction
- Others

Leather industry

- Leather tanning
  (wet blue)

*produced by LANXESS BU IPG
A strong player with leading positions in both businesses:
Organic leather chemicals and chrome products

Leather

Markets & trends
- Leather chemicals demand is driven by amount of processed hides – sustainable products & solutions gaining increasing importance
- Shoe is the largest application for leather, followed by upholstery (automotive and furniture)
- Supporting growth trends: mobility, urbanization
- Challenge: substitution by alternative materials

Competitive landscape
- Consolidation ongoing
- LEA is global #2
- Main competitors: Stahl, TFL, Smit & Zoon, Trumpler, Zschimmer & Schwarz

Innovations and sustainability focus positions
LANXESS Leather as the preferred industry partner

Sustainability focus
LEA developed recycling concepts for the production of leather and chrome chemicals
- X-Biomer in-situ
  - concept for tanneries to turn shavings, which arise during leather manufacturing process, into re-tanning polymers
  - Project was funded by BMBF and LANXESS received the innovation price for climate & environment in February 2018
  - Per concept unit the CO2 savings are expected to be in the range of 600–700 mt
- Cromtec® GC
  - converting chrome ore residues into a sellable product with multiple application areas
- Vanadium concentrate
  - refining of by-products from SDC production in line with growing vanadium demand for various industries (e.g. energy storage)
LEA offers eco-friendly X-series products for tanners’ sustainable success
LEA emphasizes a holistic “Sustainable Leather Management” approach
LANXESS’ leather business with a leading position in organic leather chemicals

**Market development**

Beef consumption determines raw hide availability, thus contributing to demand for leather chemicals

<table>
<thead>
<tr>
<th>Beef consumption [million t]</th>
<th>2016</th>
<th>2017</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td>~69</td>
<td>~70</td>
<td>~75</td>
<td></td>
</tr>
</tbody>
</table>

Beef consumption growth (CAGR, 2014-2019)
- Global: <2%
  - Asia-Pacific: ~2%
  - Europe: <1%
  - North America: ~1%
  - Latin America: <2%
  - Others: ~2%

**Market environment**

**Supporting industry trends**
- Increasing demand for sustainable products & solutions for hide processing

**Main competitors**
- Leather chemicals
  - Stahl, TFL, Smit & Zoon, Trumpler, Zschimmer & Schwarz

**LANXESS’ leather business with a leading position in organic leather chemicals**

- **Quality leader**: Innovative portfolio range with competent technical service for leather manufacturing
- **Highest standards**: Streamlined production set-up with highest HSEQ standards
- **Innovation driver**: Implementation of new business models for leather manufacturing
- **Focus on sustainability**: Strong focus on sustainability and circular economy
Material Protection Products is a global leader in biocides for disinfection and consumer protection

**Key facts**
- Segment: Performance Chemicals
- Sales: <€500 m
- Customers: ~2,200
- Products: ~450
- Production: 9 sites
- Research: 9 technical service labs
- Employees: ~500
- Market position: Among top 5 biocides companies
- Business: Global leader in biocides for wood protection, construction and disinfection
  Global customer service organization provides leading technical and regulatory support

**Sales by end use 2018**
- Construction 24%
- Beverage 21%
- Animal Health 11%
- Disinfection/Personal care 11%
- Paints and Coatings 10%
- Industrial 8%
- Others 15%

**Sales by region 2018**
- Asia-Pacific 30%
- Americas 30%
- EMEA 40%

**The business unit is divided into three business lines to optimally serve the market needs**

**Structure of BU Material Protection Products**

<table>
<thead>
<tr>
<th>Actives &amp; Disinfection</th>
<th>Biocides</th>
<th>Beverage Technology</th>
</tr>
</thead>
</table>
| - Actives for disinfection and non-biocidal applications | - Actives and preservatives for  
  - Paints and coatings  
  - Industrial applications  
  - Construction  
  - Process Control  
  - Wood protection | - Cold sterilization agent for  
  - Non-alcoholic soft drinks  
  - Wine  
  - Beer-mixes  
  - Cider  
  - Natural preservative for non-alcoholic drinks |
| OXONE® | Preventol® | Veocerin® |
| Virkon® | Biox® | Veocerin® BT Tech |
| | Biochek® | Nagaro® |
Material Protection Products – Strong international setup to serve global demand for microbial control products

The value chain comprises both production and registration, which constitutes MPP’s core strength

**Value Chain**

- **RM**
- **Active ingredients**
- **Formulations**
- **Solutions**
- **DC**

**Production**
- Active synthesis
- Regional formulation sites
- Technical expertise & Branding

**Registration**
- Own data / Active registration
- Product registration
- Regulatory support

**Global Service**
- Production sites in China, Germany, India, Singapore, UK and USA
- Local technical support – Laboratories in Brazil, China, Germany, Mexico, UK, Singapore and USA
- Global and local experts for regulatory affairs
- Present with local sales offices with dedicated MPP staff or carefully selected distribution partners
Trend towards tighter chemical regulation as key driver for LANXESS’ biocides business

Increase in number of chemical regulations ...

LANXESS with leading competence in biocides
- High entry barriers: companies to have both resources and data packages to be able to compete
- Registration of active ingredient takes 2–5 years

Leverage regulatory data packages*
- Globally (1,500 registrations; >100 countries)
- Along the value chain

Continued focus on growth at Material Protection Products: A combination of organic and external growth

2011
- Acquisition of Verichem, Pittsburgh, PA
  › industrial preservation

2012
- Acquisition of phenocides disinfectant from Lonza
  › professional hygiene

2016
- Acquisition of Chemours’ Clean and Disinfect
  › business disinfection

2011
- Acquisition of Syngenta
  › wood protection

2017
- Acquisition of IMD Natural Solutions GmbH
  › natural preservation

2011
- APAC Technical Center Velcorin® Qingdao, China
  › beverage sterilization

2013
- Acquisition of PCTS, Singapore
  › paint preservation

2012
- Manufacturing plant, Jhagadia, India
  › industrial preservation

* Initial registration costs accrue for each active ingredient but data can be re-used in other jurisdiction and downstream. Registration includes import licences, listings in national inventories, etc.

Source: LXS estimation

Initial registration costs accrue for each active ingredient but data can be re-used in other jurisdiction and downstream. Registration includes import licences, listings in national inventories, etc.

Source: LXS estimation

LANXESS Fact Book 2019
Entered the market of natural preservatives with the acquisition of IMD Natural Solutions

- Acquisition in 2017
- Delivering innovative, nature derived ingredients to protect mainly beverages, food and cosmetics
- 9 employees with laboratory in Dortmund

Natural Preservative

- Natural glycolipids derived from edible fungi
- Production by fermentation & extraction (biotechnology)
- Unique profile for application in beverages

Strategy Nagardo™

- Sole new powerful natural preservative launching since many years
- Expansion of portfolio as full solution provider to beverage industry
- Market entry US ongoing, global rollout to follow with local approvals

Identifying innovations that fit to our business –
A natural preservative derived by an edible fungus

Acquisition of IMD Natural Solutions done in 2017

- 9 FTE with a lab in Dortmund, Germany

Rationale

- Strong trend to replace chemicals with natural preservatives
- LANXESS has a global sales force and regulatory expertise
- Currently no comparable natural product on the market

Potential:

- Key market: USA; FDA approval received in 2018, further market approvals in preparation
- First substantial sales in 2020
- Full potential to be reached 2025–2030

Accessible initial market (USA):

~€200–250 m
Material Protection Products: Benefiting from increasing demand and positive industry trends

### Market development

**Total global demand 2019e:**
- Industrial Biocides ~€7.0 bn
- Animal Disinfection ~€2.9 bn

**Demand growth (CAGR 2019-2025):**
- Industrial Biocides ~3–5%
- Animal Disinfection ~6–8%

### Market environment

**Supporting industry trends:**
- Increasing meat consumption and minimized antibiotics usage drive demand for veterinary hygiene and disinfection
- Urbanization in emerging countries drives growth in construction sector
- Trend towards healthier and functional beverages fosters growth of Velcorin®

**Main competitors:**
- Dupont
- Thor
- Lonza
- BASF
- Neogen
- Elanco

---

Material Protection products with compelling business model combining innovative products and regulatory know-how

### Competence leader

Broadest regulatory expertise with global access to registration data within a highly regulated business environment

### Focus on specialties

State-of-the-art equipped microbiological, application and research laboratories

### Application know-how

Local technical support offering customized and flexible solutions

### Innovation driver

Driving adjacent growth opportunities with innovative solutions for various end markets

QUALITY WORKS.
Liquid Purification Technologies –
A leading global solution supplier for water treatment

Key facts
- Segment: Performance Chemicals
- Sales: <€500 m
- Customers: >1,500
- Products: >220
- Production: 3 sites
- Research: 5 application development centers globally
- Employees: >500
- Market position: One of global top 3 players in ion exchange resins (IXR), steadily growing reverse osmosis (RO) membrane business
- Business: Ion exchange resins, iron oxide adsorbers and functional polymers RO membrane elements and UF membranes (regionally focused)

Sales by end use 2018
- Industrial water 32%
- Drinking water 21%
- Food 20%
- Spec. processing 19%
- Others 8%

Sales by region 2018
- Asia-Pacific 25%
- Americas 25%
- EMEA 50%

Comprehensive product portfolio provides advanced solutions for treatment of water

Products and brands
- Ion exchange resins, adsorbers and functional polymers
- Reverse osmosis membrane elements
- Granular iron oxide adsorbers for water treatment
- Engineering design platform for both ion exchange and reverse osmosis equipment dimensioning

Applications
Tailor-made solutions for over 500 applications in key industries

**Water treatment**
- Cartridges for water softening
- Drinking and groundwater remediation, removal of contaminants
- Removal of heavy metals and organic contaminants from water and gas to allow reuse/recycling
- Desalination of brackish water and seawater to produce drinking water

**Food and beverages**
- Beverages (soft drinks, juices, beer): Softening, desalination, debittering
- Sugar and sweeteners: Decolorization, denitrification, final cleaning, inversion, chromatography
- Industrial food processing

**Mining**
- Recovering base metals, rare earths and precious metals
- Processing metal concentrates: E.g. purification of electrolytes
- Acid processing
- Treatment of mining wastewater: E.g. removing heavy metal traces

**Power generation**
- Fossil fuel and nuclear power plants:
  - Demineralization of boiler feed water
  - Condensate polishing
  - Water treatment in cooling ponds
  - Wastewater treatment

**Chemistry and petrochemistry**
- Catalysis for industrial products, e.g. BPA*, MTBE**
- Chloralkali electrolysis (brine processing)
- Process stream treatment & recycling
- Purifying organic chemicals e.g. using adsorbers
- CO2/CO2 capture

**Electronics & microelectronics**
- Treating ultrapure water to manufacture:
  - Semiconductors
  - LCD screens
  - Solar cells
  - LED components

**Water treatment**
- Cartridges for water softening
- Drinking and groundwater remediation, removal of contaminants
- Removal of heavy metals and organic contaminants from water and gas to allow reuse/recycling
- Desalination of brackish water and seawater to produce drinking water

**A reliable partner for our customers – Worldwide**
- Global presence via production network, research and application labs, technical marketing centers, warehouses and sales force
- Three state-of-the-art production sites in Germany and India
- Five application development centers
- Global sales with approx. 60 direct marketing experts and strong distribution networks

*Bisphenol A; **Methyl-tert-butylether

**Strong global presence for liquid purification products and solutions**
Well positioned as premium solution provider for water treatment, liquid purification & recycling

Lewatit: Unique process knowledge allows top performance in high-end applications

Example: Demineralization of Water

IXR are functional plastic beads that can change the composition of water

High-end offering

- a complete portfolio of ion exchange resins – Focusing on high-value applications
- a special production technology for uniform bead sizes – Helping customers to increase efficiency in use
- a unique phthalimide chemistry which is the basis to produce a broad portfolio of different chelating selective resins
Reverse osmosis membrane technology for high quality water treatment complements the portfolio

Four major membrane technologies for water treatment

- **RO** is a demineralization technique applying pressure to force water through a semi-permeable membrane in the direction reverse to the natural process of osmosis.
- The semi-permeable membrane allows water to pass through freely but retains all suspended solids and most dissolved ions.
- RO technology mainly used for desalination and complementary to ion exchange resin processes:
  - Membranes offer additional separation*
  - Membrane separation is physical while ion exchange resin is chemical based
- Attractive market expected to grow at double digit rate

### Technology properties

* e.g. nitrates, heavy metals, pathogenic, herbicides, viruses, bacteria
MF: Micro Filtration, UF: Ultra Filtration, NF: Nano Filtration, RO: Reverse Osmosis

Around 60% of the global Ion exchange resins segment share covered by TOP 4, but still significant room for specialization

### Operating in a consolidated market

- 3 manufacturing sites with unique production characteristics enable wide product variety and specialization
- Experienced commercial & technical sales team delivers customer-specific application know-how globally
- Readiness to participate and invest in new application development and overall market growth

### LXS strategic advantage

* Source: LPT estimate and various market studies
Benefiting from favourable global trends

Ion exchange resins market development

Reverse osmosis membrane market development

Supporting industry trends
- Rising demand for drinking water treatment in a rapidly urbanizing world due to population growth and increasing pollution
- Increasing demand for processed food especially in emerging countries
- Higher living standards drive demand for removal of pharmaceuticals and other chemical substances in water
- Changing economy and ecology standards require more efficient (cost and environment) industrial, mining and chemical processes

Main competitors
- Dow Water & Process Solutions
- Hydranautics
- Mitsubishi Chemicals
- Purolite
- Toray

Market environment

Diverse growth opportunities for Liquid Purification Technologies

Key growth drivers
- Population growth and increased environmental pollution drive need to purify contaminated drinking water sources in municipal and POU/POE systems
- High operational reliability and efficiency in sensitive water/steam cycle of power plants and industrial facilities by monodisperse resins
- Rising need for sugar, natural sweeteners and processed food due to the growing population and driven by higher standards governing process
- Increasing chemical output and expansions in chloralkali, catalysts and waste water treatment driving demand for selective impurity removal

Growth options
- Debottlenecking measures in ion exchange resins production at all LPT sites worldwide, e.g. ion exchange resins production, Leverkusen (Germany), start-up H2 2019 with single-digit € m capex input
- Development of ion exchange resins portfolio variety
- Expand on Solution Provider Strategy
- Broaden geographical reach
- Organic growth: Option to build-up production footprint (new assets) in North America or China
Water becoming the new gold – Leading solutions for the most efficient use of scarce water resources

- **Unique skills set-up**: Leading global solution provider with excellent technical and application know-how
- **Decades of experience**: Competence in water treatment, liquid purification and recycling for 80 years
- **Certified premium products**: Complementary premium products Lewatit®, Bayoxide® and Lewabrane®; German standards and certified by international organizations
- **Highest customer proximity**: Global sales force providing highest customer service levels across various industries
## Business Segment

### Engineering Materials

**Engineering Materials: Innovative plastic solutions for challenging industrial and automotive applications**

<table>
<thead>
<tr>
<th>High Performance Materials</th>
<th>Urethane Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>- One of the leading providers of a wide range of engineering plastic compounds for the automotive, electrical and electronic and other industries, benefiting from the trend of replacing metal in structural automotive parts</td>
<td>- Leading market and technology position for cast elastomer systems. Products are highly customer specific offering abrasion resistance with various degrees of hardness</td>
</tr>
</tbody>
</table>
Engineering Materials: Extended value chain yields significant earnings improvement

**Contribution to Group performance 2018***

- 22% of Sales
- 26% of EBITDA

**Sales by BU 2018***

**History of sales, capex and EBITDA (margin) 2007–2018**

Note: All references to EBITDA are pre exceptionals; As of 31 April 2017 BUs HPM and URE formed Engineering Materials. Previous years shown have been adjusted pro-forma.

*Operating segments
High Performance Materials –
A leading supplier of engineering plastics solutions

Key facts

- Segment: Engineering Materials
- Sales: €1,000–1,500 m
- Customers: ~700
- Products: ~650
- Production: 10 sites
- Research: 7 product application development center
- Employees: ~1,700
- Market position: #2 in Europe and top 5 globally
- Business: BU HPM provides a wide range of engineering plastics (compounds) to core industries across the world
  - Upstream-integration in strategic raw materials
  - Supported by a global production and R&D network with cost leadership position

Sales by end use 2018

- Automotive 50%
- Others 18%
- Electro / Electronics 32%

Sales by region 2018

- Americas 17%
- Asia-Pacific 19%
- EMEA 64%

Customized solutions to enable light weighting and miniaturization to comply with tighter emission regulations

Brands, products and applications

**Durethan**
- Polyamide 6 (PA6) and polyamide 6.6 (PA6/6.6) based plastics
  - Automotive
  - E&E
  - Construction

**Pocan**
- Polybutylene terephthalate (PBT) based plastics
  - Automotive
  - E&E

**Tepez**
- Continuous fiber-reinforced thermoplastic composite sheets
  - Automotive
  - Sports
  - Consumer electronics

**HiAnt**
- Product and application development service package
  - Integral to added value compounds business

Applications

- Automotive
- E&E
Strong setup to serve a global customer base

A reliable partner – Worldwide

- HPM offers a wide range of high-tech plastics to core industries (e.g. automotive, electronics, construction etc.)
- Global network guarantees market and customer proximity
- Global quality guaranteed by uniform production standards worldwide
- Security of supply by backwards integration into strategic raw materials
- Drive innovation to provide tailored activities and services

Focus on innovative engineering compounds with an integrated and balanced value chain

Long-term balanced capacity strategy

<table>
<thead>
<tr>
<th>Year</th>
<th>Capacity split</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td></td>
</tr>
<tr>
<td>2021</td>
<td></td>
</tr>
<tr>
<td>Future</td>
<td></td>
</tr>
</tbody>
</table>

Flexible global production setup

- Limited caprolactam merchant market exposure; caprolactam capacity of ~240 kt*
- Globalization of compound business with focus on customer proximity
Our customers benefit from an efficient value chain combined with high-end engineering

Raw materials
- Cyclohexane
- Sulfur
- Ammonia

HPM intermediates
- Caprolactam* (world-scale capacity, with single biggest production train)
- Polyamide
- Polybutylene terephthalate
- Glass fibers

Engineering plastics/Advanced composites
- Durethan® Polyamide (PA)-based engineering plastics
- Pocan® Polybutylene terephthalate (PBT)-based engineering plastics
- Tepex® Continuous fiber-reinforced thermoplastic composites

Engineering know-how
- HiAnt® Excellent product and application development
- Engineering know-how for all stages of advanced component development – Integral to added value compounds business

Top quality and high security of supply combined with technical expertise
* Caprolactam is the starting material for the polymerization of polyamides

Electric vehicles offer additional potential for High Performance Materials products

New systems required for electric vehicles
- Inverter (power electronic)
- Charging systems: on board charger, inductive charger, charging socket, power distribution
- DC/DC, AC/DC converter and electronic control units
- E-engine: rotor, stator/housing, sensors
- Battery system: housing, cell module, battery electrics, mounting systems, cooling systems
- Auxiliary equipment: air compressor, cooling pump, PTC heater

Existing technologies and materials offer ideal preconditions for the promotion of new applications
Strong growth of engineering plastics per vehicle due to increasing electrification of powertrains

Main applications Under the Hood (UTH)  Six focus systems for e-mobility

- Air management
- Oil modules
- Cooling
- Frontend

- Battery system
- Inverter
- E-engine
- Charging system

Huge potential for electric applications

- Global HPM electric components [t]
- Battery Electric Vehicle
- Plug Hybrid EV
- Full Hybrid EV
- Mild Hybrid EV
- Internal Combustion Engine

“Under the Hood” market will remain robust whereas electric components will catch up by 2025

Conclusions from market assessment
- Electrification will increase significantly in all regions
- Six focus applications for electrified powertrain identified – biggest potential in battery systems
- Global market for NeMo applications with significant volumes in 2025 – exceeding UTH in 2035

Six focus systems identified
- Battery System
- DC/DC Converter & ECU
- e-Engine
- Auxiliary Equipment
- Power Electronics
- Charging Systems

Huge potential for electric applications

- Global HPM electric components [t]
- Battery Electric Vehicle
- Plug Hybrid EV
- Full Hybrid EV
- Mild Hybrid EV
- Internal Combustion Engine

“Under the Hood” remains attractive

*Demand estimated on the basis of today’s average 2l engine size. Downsizing effects for XHEVs will lead to reduced demand of UTH materials per vehicle in future
High Performance Materials expects a strong growing market for its new thermoplastic composites material TEPEX® in the upcoming years.

TEPEX® addressable market

High Performance Materials is already focusing on circularity alongside the entire value-chain.

**PIR* from base resin production**
- High quality PA6 from internal production waste. However, due to high yields the amount of internal waste rather limited.
- Application in Durethan Q-Grades with 35% recycled PA for selected customers.

**PIR* for glass fiber production**
- 100% recycling of internal post-industrial glass waste
- Milling of glass waste and (re-)usage in
  - Durethan FR compounds
  - Glass fiber production

**“Green” compounds**
- Pocan ECO grades with minimum share of recycled PET from bottle scrap (25–30%)
- Standard EP compounds consist of up to 5% recycled production waste

---

* PIR = post-industrial recycle
Switch potential due to higher price, lower supply security of PA66 and technical switch feasibility

- Increasing delta between PA6 and PA66 base resins driven by profit focus of Adiponitrile (AND) players
- Higher raw material price in PA66, driven by lack in material supply
- Historic price delta between PA6 and PA66 base resins

Demand growth CAGR (2018–2023)*
- World ~4%
- Latin America ~3%
- North America ~2%
- Asia-Pacific ~5%
- EMEA ~2%

PA/PBT plastics growth in cars**
- Vehicle production [units]
- PA/PBT plastics [kg/unit]

Market environment
- Strong global market position with knowledge leadership in high-tech plastics compounds
- Technology competence based on continuous product and application development
- Growth in important industries
  - Growing car demand, especially in BRICS and other developing areas
  - Growth of electrics & electronics industry driven by innovation and availability to more people

Main competitors:
- BASF, DSM, DuPont
High Performance Materials as leading provider of smart solutions for a sustainable future of mobility

<table>
<thead>
<tr>
<th>High competence</th>
<th>High-performance materials and high-end engineering know-how at its best</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovation focus</td>
<td>Expertise in different industries and close customer cooperations translate into new applications</td>
</tr>
<tr>
<td>Best in value</td>
<td>Cost and performance optimized solutions ready for series production</td>
</tr>
<tr>
<td>Smart Solutions</td>
<td>Lightweight solutions to enable mobility trends – Innovative, flexible, fast</td>
</tr>
<tr>
<td>Cost competitiveness</td>
<td>Through fully integrated value chain, strong cost competitiveness is ensured</td>
</tr>
</tbody>
</table>
Urethane Systems is a leading niche player in specialized and innovative urethane based products

Key facts
- Segment: Engineering Materials
- Sales: <€500 m
- Customers: ~750
- Products: >500
- Production: 6 sites
- Research: 1 R&D center
- Employees: ~400
- Market position: #1 in hot cast elastomer systems
- Business: One of the leading global manufacturers of urethane systems technology leader in Low Free (LF) technology*

Sales by end use 2018
- Industrial 52%
- Construction 5%
- Transportation 5%
- Energy 5%
- Tires & Wheels 6%
- Mining 9%
- Others 18%

Sales by region 2018
- Americas 62%
- Asia-Pacific 17%
- EMEA 21%

Urethane Systems – Stronghold in elastomers as highly specialized, customer-centric business

Sales by application 2018
- Elastomers
- Adhesives
- Coatings
- Polyols

Main characteristics
- Elastomers focus with leading position
- Strong presence in technically demanding elastomer applications (esp. Oil & Gas, Tyres & Wheels) with high level of customer specific development work
- Demand above GDP driven by increasing automation, replacement of rubber by PU, shifting of mechanical boundaries
- Best position to serve global customers consistently

Elastomer know-how being leveraged to coating and adhesive applications (esp. LF technology)
Polyols as intermediate business with leading regional position in North America – primarily focused on downstream CASE applications

*LF = low level of free isocyanates. This product segment of prepolymer meets or exceeds tightening health and safety regulations
High-quality solutions are provided for four main product areas

<table>
<thead>
<tr>
<th>Cast Elastomers</th>
<th>Coatings</th>
<th>Adhesives &amp; Sealants</th>
<th>Polyester Polyols</th>
</tr>
</thead>
<tbody>
<tr>
<td>Products</td>
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<td>Products</td>
<td>Products</td>
</tr>
<tr>
<td>• Adiprene® LF</td>
<td>• Triene®</td>
<td>• Triene®</td>
<td>• Fomrez®</td>
</tr>
<tr>
<td>• Vibrathane®</td>
<td>• Witcoflex®</td>
<td>• Witcoflex®</td>
<td></td>
</tr>
<tr>
<td>• Adiprene®</td>
<td>• Vibracure®</td>
<td>• Witcobond®</td>
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<tr>
<td>• Vibracure®</td>
<td>• Vibracat®</td>
<td>• Quasilan®</td>
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<tr>
<td>• Duracure®</td>
<td>• Ultralast®</td>
<td></td>
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<tr>
<td>Key applications</td>
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<td>Key applications</td>
</tr>
<tr>
<td>• Oil &amp; Gas</td>
<td>• Leather &amp; Textile</td>
<td>• Field applied ambient</td>
<td>• PU foam, TPU</td>
</tr>
<tr>
<td>• Mining</td>
<td>• Glass fiber sizing</td>
<td>cured adhesives &amp; sealants</td>
<td>and elastomeric production</td>
</tr>
<tr>
<td>• Wheels &amp; Tires</td>
<td>• Breathable coatings</td>
<td>• Factory applied heat cured</td>
<td>• Adhesives for metals, paper and wood</td>
</tr>
<tr>
<td>• Paper &amp; Printing</td>
<td>• Automotive coatings</td>
<td>adhesives &amp; sealants</td>
<td>• Protective coatings</td>
</tr>
<tr>
<td>• Industrial</td>
<td>• Protective coatings</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Urethane Systems offers materials for a very diverse set of applications

Thickness

- 100 mm
- <0.1 mm

<table>
<thead>
<tr>
<th>Wheels</th>
<th>Mining</th>
<th>Subsea Oil &amp; Gas</th>
<th>Oil Pipelining</th>
<th>Cosmetics</th>
<th>Agriculture</th>
<th>Infrastructure</th>
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<td>Cosmetics</td>
<td>Seals</td>
<td>Paper</td>
<td>Food</td>
<td>Belts</td>
<td>Concrete Molds</td>
</tr>
<tr>
<td>Electronics</td>
<td>Sports Track</td>
<td>Abrasives</td>
<td>Carpet Underlay</td>
<td>Medical</td>
<td>Fabric Belts</td>
<td>Ballistics</td>
</tr>
<tr>
<td>Sealants</td>
<td>Textiles</td>
<td>Coil Coatings</td>
<td>Adhesives</td>
<td>Construction</td>
<td>Automotive</td>
<td>Metal Protection</td>
</tr>
</tbody>
</table>
Urethane Systems –
Local coverage for a global customer base

A world leader in specialized systems for urethane elastomers, coatings, adhesives and sealants

Prepolymer production
- Polyol (60–75%)
- Disocyanate (25–40%)
- Low molecular weight diols (other additives, stabilizers etc.)

Prepolymer (tailor-made for specific properties and final applications)

Curing and application development
- Technical Service
- Problem Solving
- Design Assistance
- Advanced Testing
- Model Calculations
- Fatigue Resistance

Production of end product
- Mixing and pouring into heated mold
- Hot-cast PU Elastomers
- Spray, brush, rollercoat, impregnation, curtain, etc.
- Air-dry or dry/heat-cure
- Flexible PU surface coating (for soft and hard substrates)
- Adhesives and Sealants

Customer expertise
- Spray, rollercoat, inject

LANXESS expertise
- Part of LXS/Urethane Systems value creation
- Sourced raw materials/intermediates
- End products
Our innovation priorities follow needs for better sustainability & processing and increasing performance

**Improved sustainability**
- Improve Low Free (LF) technologies
- Develop new curing systems (e.g. MbOCA* Replacement)
- Strengthen offering of waterborne, solvent-free products (Witcobond®, Trixene Aqua® blocked crosslinkers)

**Easier processing**
- Develop low viscosity systems for use in cold cast, encapsulation, adhesives, binders, and other applications
- Enable processing advantages to cast polyurethane processors (e.g. Ribbon Flow®)

**Increasing material requirements**
- Develop and tailor high-performing cast systems to extend the usable life of urethane components and to replace non-cast materials
- Develop thermoplastic polyurethanes for extreme applications (Ultralast® TPU)

* MbOCA = curing agent used primarily to produce castable polyurethane parts. It is classified as carcinogenic and will be banned in the EU

Urethane Systems enables performance through innovative product developments

**Urethane Systems’ sustainable chemistry**
- General trend to lower free isocyanate content in urethanes and use of modern curing systems
- LANXESS is the only manufacturer of Low Free (LF) products across all chemistries (TDI, MDI, PPDI, HDI, and IPDI)
- Adiprene LF is a unique technology that complies with the new regulations and labeling requirements

**Adiprene LF MDI is a premium MbOCA-Replacement technology**

- **MbOCA-Free**
- **Premium performance**
- **Improved processing**

* MbOCA = curing agent used primarily to produce castable polyurethane parts. It is classified as carcinogenic and will be banned in the EU
Urethanes Systems – A global leader with sustainable growth and significant future business success

Market development

<table>
<thead>
<tr>
<th></th>
<th>2018</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
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<tbody>
<tr>
<td>General demand growth* (CAGR 2018–2023)</td>
<td></td>
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<tr>
<td>&gt;4%</td>
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<td>&gt;3%</td>
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<td>~3%</td>
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<td></td>
<td>EMEA</td>
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<tr>
<td>&gt;2%</td>
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<td>LATAM</td>
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</table>

- New products for new markets drive growth
- Example: Unique high performance blocked, 1K systems
  - Based on LF technology, delivers unsurpassed industrial hygiene, processing ease, and properties unattainable by conventional systems
  - LANXESS is delivering these new products to the elastomers and coatings markets

Market environment

Supporting industry trends

- Substitution of competing materials such as rubber, metal and epoxy due to performance advantages of cast urethane elastomers
- Trend towards use of sustainable chemicals supporting low-free technology (reduces fume exposure during handling)

Main competitors

- Covestro (CAS)
- BASF (Elastollan)
- DOW (Hyperlast)
- Dongda
- COIM
- Huntsman (Tecnoelastomeri)
- DIC
- Mitsui Chemicals

Urethanes Systems grows on the back of product innovation and by entering new markets

Leadership position

A global leader in specialty polyurethane systems providing differentiated technologies

Innovation driver

Focus on innovative, premium technologies for demanding applications based on current trends

Sustainable solutions

Sustainability as key principle in action with LF technology, wind, recycling, etc.
FINANCIALS
Conservative financial policy and centralized risk management

- Centralized management of all relevant risks
  - Liquidity & refinancing
  - Foreign exchange, interest rates and commodity risk
  - Counterparty risk
  - Customer credit risk
  - Insurances
- Pension risk management

Our active risk management aims at the reduction of financial and operational volatilities

Shareholders benefit from rising dividend and share buy-back

A reliable income stream for investors

<table>
<thead>
<tr>
<th>Year</th>
<th>Dividend (€)</th>
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<tbody>
<tr>
<td>2006</td>
<td>0.25</td>
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<tr>
<td>2007</td>
<td>0.50</td>
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<tr>
<td>2008</td>
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<tr>
<td>2009</td>
<td>0.70</td>
</tr>
<tr>
<td>2010</td>
<td>0.85</td>
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<tr>
<td>2011</td>
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<tr>
<td>2012</td>
<td>1.00</td>
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<tr>
<td>2013</td>
<td>0.50</td>
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<tr>
<td>2014</td>
<td>0.60</td>
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<tr>
<td>2015</td>
<td>0.70</td>
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<tr>
<td>2016</td>
<td>0.80</td>
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<tr>
<td>2017</td>
<td>0.90</td>
</tr>
<tr>
<td>2018</td>
<td>0.90</td>
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Dividend Policy

- LANXESS has been pursuing a consistent dividend policy for years
- Our goal remains to increase the dividend each year or at least to keep it at a stable level
Raw material prices stable, showing substantially lower volatility

LANXESS global raw materials index*

Total raw material expenses (2017)

Lower volatility in raw material basket clearly visible (w/o ARL since Q2 2018)

LANXESS no longer dependent on few raw materials

*average 2013 = 100%

Stable funded status of pensions

Pension debt actively and well managed*

- Group wide funding ratio of 57%
- Pension obligations significantly decreased with ARLANXEO disposal
- Like 2016, €200 m pension funding in German CTA in December 2018
- Continued active risk management (e.g. liability matching, tail risk hedging of German CTA, outsourcing)
- On-going monitoring and optimization of pension structure

*Figures in million €
LANXESS manages its net financial debt tightly

Total Net Debt* / EBITDA pre

Maturity profile actively managed and well balanced

Long-term financing secured

- Diversified financing sources
  - Bonds & private placements
  - Syndicated credit facility
- Average interest rate of financial liabilities ~2%
- Next bond maturity in 2021
- All group financing executed without financial covenants

Liquidity and maturity profile as per September 2019

* Hybrid bond with contractual maturity date in 2076 has a first optional call date in 2023.
All three public ratings were upgraded after announcement of full ARLANXEO disposal

Credit rating history

<table>
<thead>
<tr>
<th>Year</th>
<th>S&amp;P Global Ratings</th>
<th>Moody’s Investors Service</th>
<th>Scope Ratings</th>
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</thead>
<tbody>
<tr>
<td>2014</td>
<td>BBB-/ stable</td>
<td>Baa3/ stable</td>
<td>BBB+ stable</td>
</tr>
<tr>
<td>2015</td>
<td>BBB-/ positive</td>
<td>Baa3/ stable</td>
<td>BBB+/ stable</td>
</tr>
<tr>
<td>2016</td>
<td>BBB-/ negative</td>
<td>Baa3/ stable</td>
<td>BBB+/ stable</td>
</tr>
<tr>
<td>2017</td>
<td>BBB-/ stable</td>
<td>Baa3/ stable</td>
<td>BBB+/ stable</td>
</tr>
<tr>
<td>2018</td>
<td>BBB-/ stable</td>
<td>Baa2/ stable</td>
<td>BBB+/ stable</td>
</tr>
<tr>
<td>2019</td>
<td>BBB/ stable</td>
<td>Baa2/ stable</td>
<td>BBB+/ stable</td>
</tr>
</tbody>
</table>

Investment grade rated since spin-off in 2004

Agencies honor LANXESS’ realignment process and management’s commitment to maintain IG

- The company’s portfolio realignment will bring higher and more stable margins.
- We believe LANXESS’ management is committed to preserving its leverage metrics after the ARLANXEO disposal.
- We expect the company’s credit metrics to temporarily weaken in 2019 and strengthen in 2020.
- Portfolio realignment to enhance the business risk profile and future quality of earnings and cash flow, with more emphasis on specialty chemicals.
- Positive free cash flow and proceeds from Currenta and Arlanxeo divestment to help reduce leverage following the Chemtura acquisition and build capacity within the current rating category.
- The rating still reflects LANXESS’ strong position across various medium-sized and niche specialty chemicals markets […]
- Regarding the improved end-market mix, we consider the financial risk profile to be less sensitive to more challenging economic conditions.

Source: Rating Agencies
Evolving financials since 2009

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<thead>
<tr>
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<tbody>
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<td>EBITDA pre [€ m]</td>
<td>465</td>
<td>918</td>
<td>1,146</td>
<td>1,223</td>
<td>735</td>
<td>808</td>
<td>885</td>
<td>995</td>
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<td>913</td>
<td>1,515</td>
<td>1,483</td>
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<td>1,363</td>
<td>269</td>
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<td>1,381</td>
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<tr>
<td>Net financial debt/</td>
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<tr>
<td>EBITDA pre</td>
<td>1.7x</td>
<td>1.0x</td>
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<td>2.4x</td>
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<td>0.3x</td>
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<td>Gearing [%]</td>
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<td>52</td>
<td>73</td>
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<td>50</td>
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<tr>
<td>EPS pre [€]*</td>
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<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>1.73</td>
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<td>2.03</td>
<td>2.69</td>
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<tr>
<td>Dividend [€]</td>
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<td>0.70</td>
<td>0.85</td>
<td>1.00</td>
<td>0.50</td>
<td>0.50</td>
<td>0.60</td>
<td>0.70</td>
<td>0.80</td>
<td>0.90</td>
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</table>

*Change in EPS definition: EPS pre exceptional items and amortization of intangible assets, earnings per share disregarding exceptional charges and income, amortization of intangible assets and attributable tax effects as well as (only in 2017) one-off earnings effects of the U.S. tax reform, from 2017 onwards continuing operations only.

## Balance sheet

<table>
<thead>
<tr>
<th>Intangible assets</th>
<th>1.811</th>
<th>1.755</th>
<th>1.764</th>
<th>1.769</th>
<th>944</th>
<th>300</th>
<th>320</th>
<th>323</th>
<th>390</th>
<th>373</th>
<th>226</th>
<th>196</th>
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<tbody>
<tr>
<td>Investment accounted for using the equity method</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>12</td>
<td>8</td>
<td>12</td>
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<td></td>
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<tr>
<td>Investments in other affiliated companies</td>
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<td>2</td>
<td>9</td>
<td>12</td>
<td>12</td>
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<td>Non-current derivative assets</td>
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<td>Other non-current financial assets</td>
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<td>20</td>
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<td>11</td>
<td>11</td>
<td>8</td>
<td>82</td>
<td>74</td>
<td>79</td>
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<tr>
<td>Deferred taxes</td>
<td>324</td>
<td>307</td>
<td>287</td>
<td>442</td>
<td>442</td>
<td>361</td>
<td>380</td>
<td>254</td>
<td>211</td>
<td>196</td>
<td>170</td>
<td>163</td>
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<tr>
<td>Non-current assets</td>
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<td>133</td>
<td>131</td>
<td>133</td>
<td>32</td>
<td>38</td>
<td>39</td>
<td>56</td>
<td>102</td>
<td>120</td>
<td>113</td>
<td>92</td>
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<tr>
<td>Inventories</td>
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<td>1.347</td>
<td>1.680</td>
<td>1.429</td>
<td>1.349</td>
<td>1.384</td>
<td>1.299</td>
<td>1.527</td>
<td>1.386</td>
<td>1.094</td>
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<td>1.146</td>
<td>942</td>
<td>733</td>
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<tr>
<td>Cash and cash equivalents</td>
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<td>229</td>
<td>797</td>
<td>538</td>
<td>355</td>
<td>366</td>
<td>418</td>
<td>427</td>
<td>386</td>
<td>178</td>
<td>160</td>
<td>313</td>
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<td>Capital stock and capital reserves</td>
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<td>1.317</td>
<td>1.317</td>
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<td>1.317</td>
<td>1.317</td>
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<td>889</td>
<td>889</td>
<td>889</td>
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<td>818</td>
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<td>4</td>
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<td>Equity attributable to non-controlling interests</td>
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<td>-10</td>
<td>-7</td>
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<td>1.176</td>
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<td>16</td>
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<td>Provisions for pensions and other post-employment benefits</td>
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<td>1.249</td>
<td>1.215</td>
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<td>893</td>
<td>679</td>
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<td>73</td>
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<td>82</td>
<td>75</td>
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* SORIE Restatement
## P&L

### LANXESS (€ m)

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<tbody>
<tr>
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<td>7,197</td>
<td>6,530</td>
<td>7,699</td>
<td>7,902</td>
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<td>8,300</td>
<td>9,094</td>
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<td>966</td>
<td>1,834</td>
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<td>1,754</td>
<td>1,748</td>
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<td>1,548</td>
<td>2,106</td>
<td>2,010</td>
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<td>Gross Margin</td>
<td>26,5%</td>
<td>26,6%</td>
<td>25,5%</td>
<td>26,6%</td>
<td>22,8%</td>
<td>22,1%</td>
<td>19,8%</td>
<td>18,7%</td>
<td>23,2%</td>
<td>22,9%</td>
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<tr>
<td>Other operating income</td>
<td>65</td>
<td>50</td>
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<td>147</td>
<td>207</td>
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<td>-308</td>
<td>-527</td>
<td>-190</td>
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<td>-261</td>
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<td>-79</td>
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<td>-75</td>
<td>-160</td>
<td>-190</td>
<td>-399</td>
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<td>-33</td>
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<tr>
<td>Operating Result (EBIT)</td>
<td>399</td>
<td>282</td>
<td>504</td>
<td>299</td>
<td>446</td>
<td>415</td>
<td>218</td>
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<td>808</td>
<td>776</td>
<td>607</td>
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<td>Income/expense from investments in affiliated companies - net</td>
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## Segment data

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Fax.: +49-221 8885 5400
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