



# LANXESS – Energizing Chemistry

A short introduction

Technical Information for Sales & Customers

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Mr. Derrick Lau

Technical Marketing Manager, ASEAN / ANZ / PAK

Liquid Purification Technologies

# LANXESS – A globally operating specialty chemicals company



## Specialty chemicals company



- Spin-off from Bayer in 2004
- Specialty chemicals portfolio: chemical intermediates, additives, specialty chemicals and plastics

## Global success story



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

## Strategy of profitability and resilience



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




# Global presence

## Global production network



# LANXESS – a global specialty chemicals group



Advanced Intermediates	Specialty Additives	Performance Chemicals	Engineering Materials
			
<ul style="list-style-type: none"><li>▪ Advanced Industrial Intermediates</li><li>▪ Saltigo</li></ul>	<ul style="list-style-type: none"><li>▪ Additives</li><li>▪ Rhein Chemie</li></ul>	<ul style="list-style-type: none"><li>▪ Material Protection Products</li><li>▪ Inorganic Pigments</li><li>▪ Leather</li><li>▪ Liquid Purification Technologies</li></ul>	<ul style="list-style-type: none"><li>▪ High Performance Materials</li><li>▪ Urethane Systems</li></ul>

**Group Functions and countries**

**Business unit set up fosters dedication and entrepreneurship**

# LANXESS – A sustainable and reliable partner for the future



## Sustainability

- Committed to long-term sustainable development
- Member of Dow Jones Sustainability World & Europe Index and Carbon Disclosure Project (CDP)



## Digitalization

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

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## Critical Mass

- Stock-listed company with EUR 7.2 billion sales
- Financial resources to support growth



**MDAX**

## Global reach

- Present in 33 countries with local service





# Liquid Purification Technologies – a leading global solution supplier for liquid treatment



## Facts

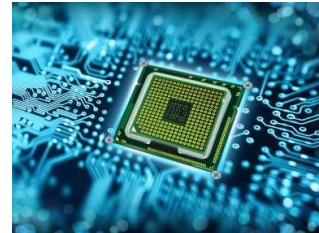
- Part of: LANXESS Performance Chemicals Segment
- Customers: > 1,500
- Market position: One of the top ion exchange resin (IX) manufacturer, strong commitment to new reverse osmosis (RO) business

## Products & Brands

- Ion exchange resins, iron oxide adsorbers & functional polymers
- Reverse osmosis membrane elements
- Leading design software for IX and RO equipment dimensioning

**X Lewatit®** **X Lewabrane®** **X Bayoxide®** **LewaPlus®**

## Applications



# LANXESS sites for liquid purification applications – products and solutions for customers worldwide



- Global production network to serve worldwide demand
- Three state-of-the-art IX production sites in Germany and India
- Production facilities for RO membrane elements and iron oxide adsorbers in Germany
- Global sales with approx. 60 direct marketing experts and strong distribution networks

**A reliable partner – worldwide**

# Leverkusen plant is the most versatile ion exchange resin facility in LPT's production network

## IX production, Leverkusen, Germany

- Production of specialty anion (based on phthalimide chemistry), cation exchange resins & chelating resins
- Production in Leverkusen started in 1956
- Annual capacity of more than 35,000 metric tons
- €10 m invest in 2014 in a new production line for weak acidic cation exchange resins including a new state-of-the-art facility for food-grade filling and packaging.
- 80 people employed in Leverkusen plant





# LANXESS in the Bitterfeld-Wolfen industrial park

## IX production, Bitterfeld-Wolfen, Germany

- LANXESS currently has around 160 employees in Bitterfeld (2011: 100)
- The Liquid Purification Technologies business unit has two plants at the Bitterfeld site
- EUR 40 million investment in the site over the past five years
- Quality products of the Lewatit® brand have represented high-quality ion exchange resins, adsorbers and functional polymers for nearly 80 years
- LANXESS has been manufacturing Lewabrane® RO membrane elements there since 2011



# State-of-the-art production facilities for ion exchange resins and reverse osmosis membrane elements



## Ion exchange resin production

- Production of the latest generation of monodisperse resins (gel and macroporous grades)
- Plant was built up in 1998 but is still the most-modern and largest of its kind, worldwide
- Production and logistics areas, laboratories, quality assurance, administration, etc., covering approx. 24,000 m<sup>2</sup>

## RO membrane element production

- Research & development and production of membrane elements for reverse osmosis
- Cutting-edge facility covering an area of 4,000 m<sup>2</sup>
- Laboratories, logistics areas and offices alongside production area



# India production gives LPT direct access to strong growing emerging markets; “German quality, made in India”

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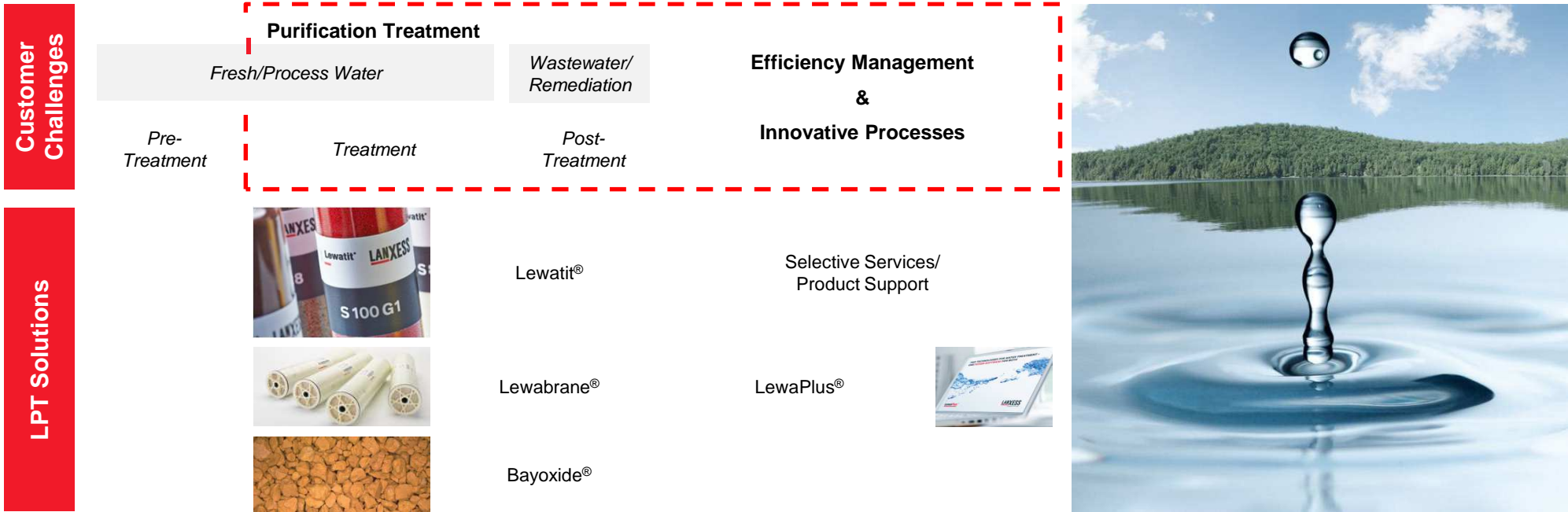
## IX production, Jhagadia, Gujarat, India

- LANXESS as first international player to set up an ion exchange resins manufacturing plant in India
- Most modern plant of its kind in Asia with own water treatment, cogeneration plant and new chemical processes
- Plant operating since December 2010
- Annual capacity of more than 20,000 metric tons
- 250 workers employed on site
- German standards regarding sustainability, safety and product quality applied





# LPT is strongly positioned as solution provider of premium products for water treatment, liquid purification & recycling



- One of the world's leading solution providers of premium ion exchange resins, iron oxide adsorbents and RO membranes used by various players in the water treatment industry (OEMs, distributors, end-users)
- Products provide intelligent solutions to meet the challenges associated with the global water shortage
- Comprehensive know-how in trouble shooting, installation design and feasibility studies



# Tailor-made solutions for over 500 applications in key industries (1/3)

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Selection

## Water treatment

- Desalination of brackish water and seawater to produce drinking water
- Drinking and groundwater remediation, removal of contaminants such as arsenic, chromium, uranium and heavy metals
- Removal of heavy metal ions and organic contaminants from industrial wastewater



## Power generation

- Applications in fossil fuel power plants and nuclear power plants include:
  - Demineralization of boiler feed water
  - Condensate polishing
  - Water treatment in cooling ponds
  - Wastewater treatment



# Tailor-made solutions for over 500 applications in key industries (2/3)

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Selection

## Food & beverages

- Cartridges (mains water)
  - Softening (removing hardening materials)
- Beverages (soft drinks, juices, beer)
  - Softening, desalination, debittering
- Sugar & sweeteners
  - e.g., demineralization, decolorization, final cleaning (polishing), inversion, chromatography
- Industrial food processing



## Chemistry & petrochemistry

- Catalysis
  - Catalysis for plastics production or esterification, e.g., BPA, MTBE
- Chloralkali electrolysis (brine processing)
- Process steam treatment and recycling
  - e.g., in the metal processing and finishing industry
- Purifying organic chemicals
  - e.g., using adsorbents



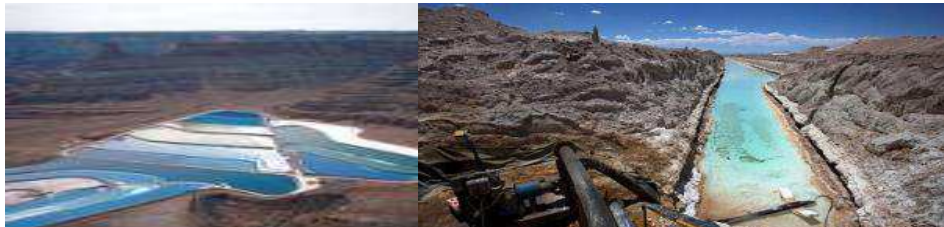
# Tailor-made solutions for over 500 applications in key industries (3/3)

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Selection

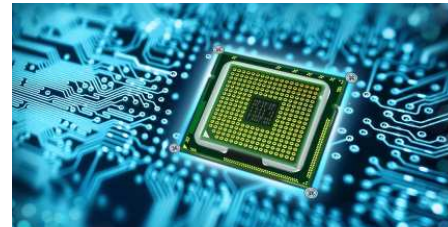
## Mining

- **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
  - AMD (Acid Mine Drainage)



## Electronics & microelectronics

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



# LPT's prime brand Lewatit® – broad and innovative ion exchange resin portfolio expands in new applications

**LANXESS**  
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## Characteristics

- Complete product portfolio of WAC, SAC, WBA, SBA and selective resins in gel and macroporous types
- Monodisperse resins available in small and large bead sizes
- Specialties for diverse, high-end applications e.g.: Ultrapure Water, Foodstuffs, Chemicals Processing, Metals Purification and Drinking Water

## Benefits

- Good chemical and mechanical stabilities
- Excellent kinetics and selectivity
- High capacities, long cycle times
- Good economics due to lean design, low regenerant costs, high performance

## Main brand

**X Lewatit®**





# LPT's hero brand Lewabrane<sup>®</sup> – reverse osmosis membrane elements to complement the ion exchange resins portfolio

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## Characteristics

- Spiral wound, thin-film composite RO membrane elements
- Complete brackish water and seawater product portfolio that includes standard pressure, fouling resistant and low energy product types
- Recently ASD membrane types launched
- Complete portfolio NSF certified



## Benefits

- Lower surface charge and higher cross-linkage lead to lower fouling tendency and a constant high salt rejection
- Improved rejection for nitrate, boron, and silica
- Performance test of each element before customer shipment



## Main brand

**X Lewabrane<sup>®</sup>**



# Bayoxide<sup>®</sup> is a granular iron oxide specifically designed as an effective filter adsorbent for removal of various species

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## Characteristics

- High surface area, robust stability and superior adsorption capacity
- Advanced adsorption kinetics (e.g., for arsenate and phosphate)
- Robust mechanical properties due to high abrasion stability
- Simple passive pump-and-treat system applying fixed bed adsorption
- Delivered as dry material

## Benefits

- Arsenic removal from water safely below a limit of 5 µg/l
- Phosphate and silicate removal from aquarium water and surface water (e.g., fish, garden and swimming ponds)
- Antimony, selenium and selected heavy metal removal from water
- Purification of mining water, process water and process streams

## Main brand

**X Bayoxide<sup>®</sup>**



# LewaPlus® – innovative software tool for combined IX & RO water treatment system design

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## Characteristics

- Available processes: IX: (Mixed-bed) demineralization, softening and dealkalization, demi check, condensate polishing; RO: Brackish and seawater desalination
- Immediate and extremely fast calculation of system performance
- Product scout for proper resin and membrane selection, product datasheets, MSDS for Lewatit® as well as technical service bulletins

## Benefits

- Conduct both IX and RO designs inside the same program
- Seamlessly transfer of the RO permeate to the IX module for quick and accurate design of the complete desalination system
- Highest data security and offline availability (not cloud-based)
- Available in 10 languages

## Main brand

**LewaPlus®**



# Smart solutions for more efficient use of scarce water resources – energized by LANXESS



Leading global solution provider with excellent technical and application know-how



Competence in water treatment, liquid purification and recycling for almost 80 years



Complementary premium products Lewatit®, Bayoxide® and Lewabrane®; German standards and certified by international organizations



Global highly competent sales & service team





**LANXESS**

Energizing Chemistry

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