



 **BASF**

We create chemistry

Sustainable Solution Steering – Accelerator Example Collection

- for external use -





> 60,000
solutions in scope



> 12,000
Accelerator solutions
with €15 billion sales in 2018



> 60%
of R&D budget spent
on Accelerator projects
in 2018



> 800
actions defined



~ 2,400
experts involved
e.g. R&D, Product Safety,
Sales, Marketing, Sustainability

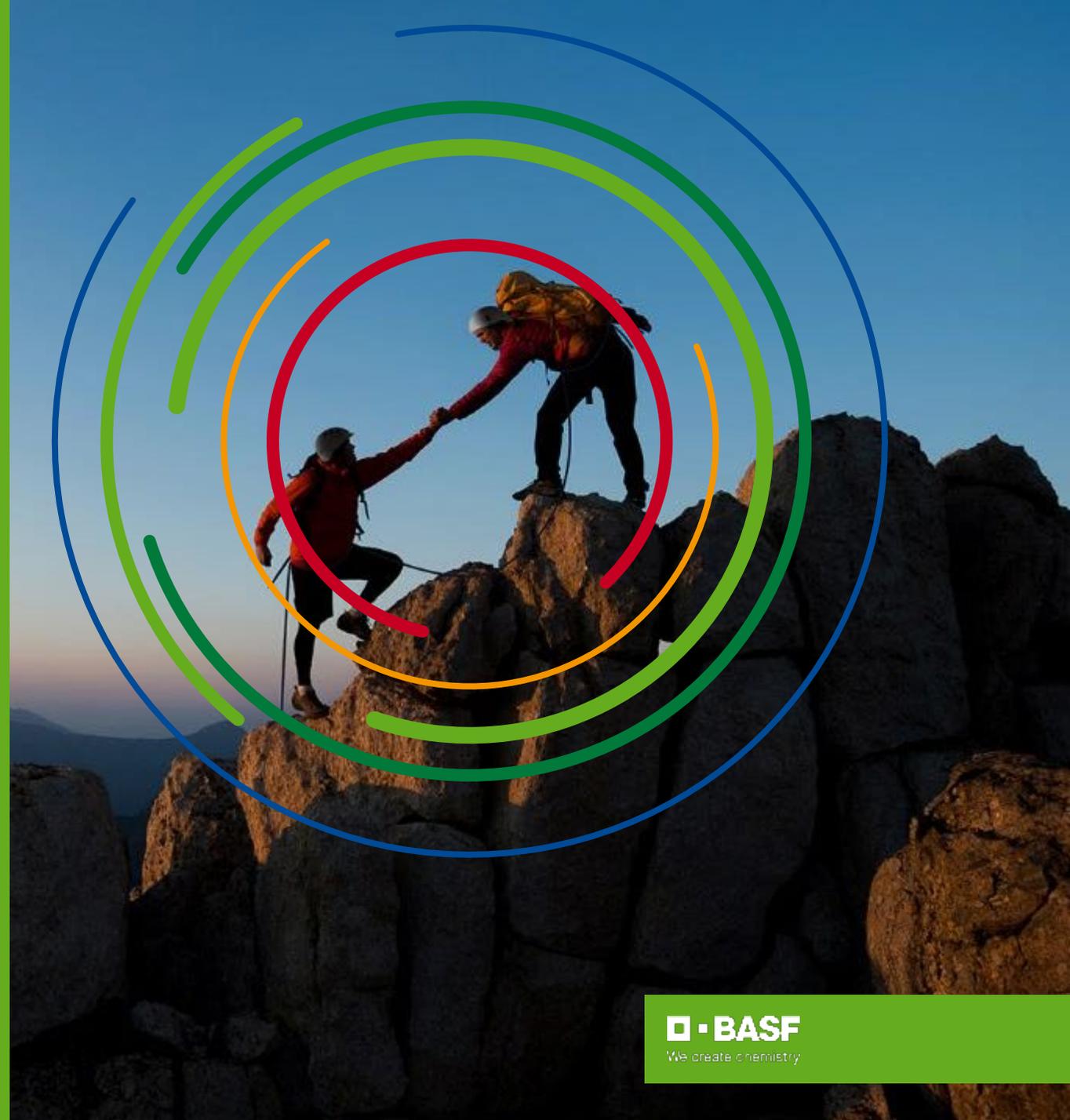
We create chemistry for a sustainable future

Our aspiration

We have a passion for chemistry and our customers.

This passion stems from our expertise, innovative and entrepreneurial spirit and the strength of our Verbund.

To be the world's leading chemical company, we will grow profitably and create value for society.





Our customers in different industries face diverse challenges – Chemistry is key to solving these challenges



Agriculture



Health & Nutrition



Energy & Resources



Consumer Goods



Transportation



Electrical & Electronics



Construction & Housing

Chemistry as enabler to meet current and future needs

The world by 2050

~10 billion people

70% of the world population will live in cities

35% more primary energy consumption

30% more food needed



That's why we initiated the systematic Sustainable Solution Steering approach

It's a three step process



Step 1

Analysis of **sustainability needs** and trends in the value chains

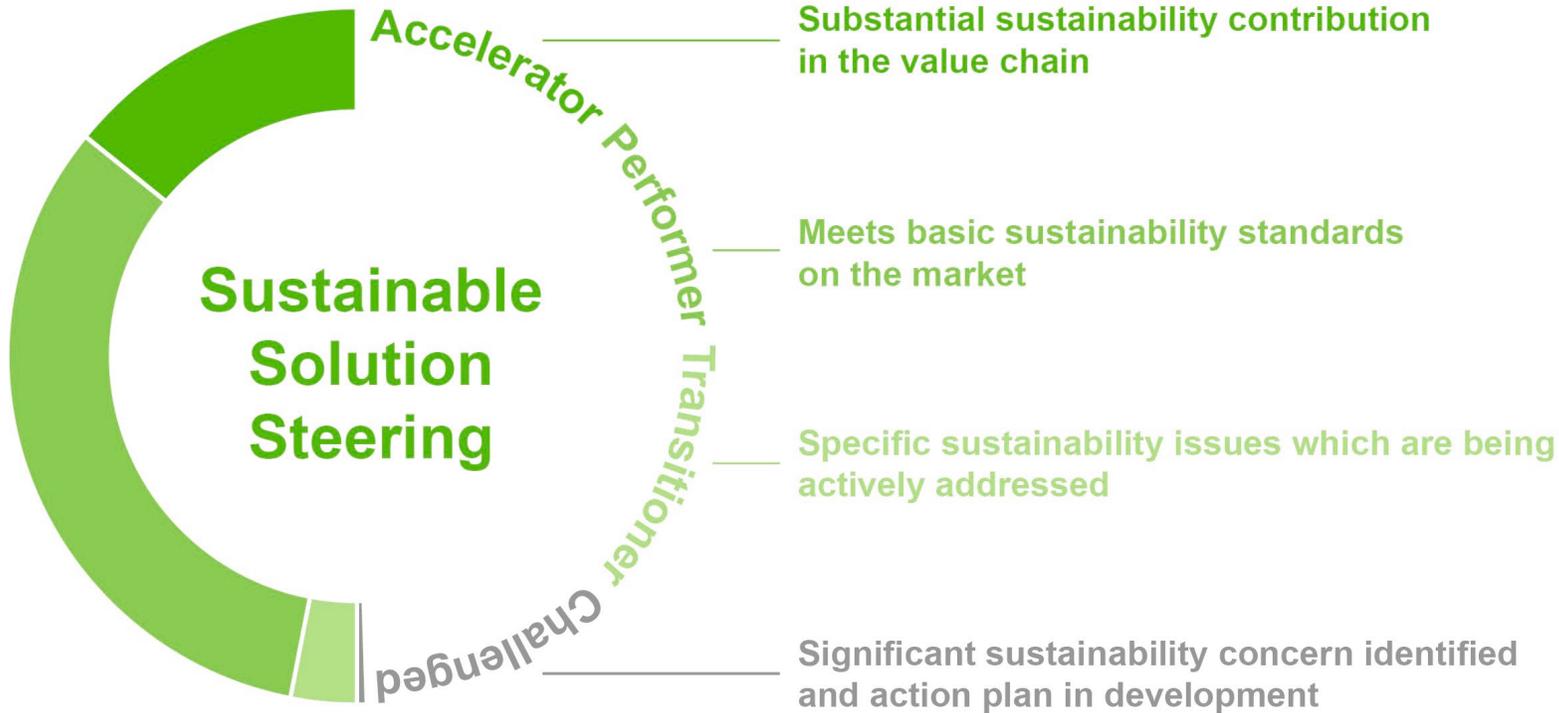
Step 2

Evaluation and categorization of product sustainability performance in the market application

Step 3

Development of action plans for strategies, R&D, and market approach

€22 billion sales with Accelerator products by 2025 through innovation

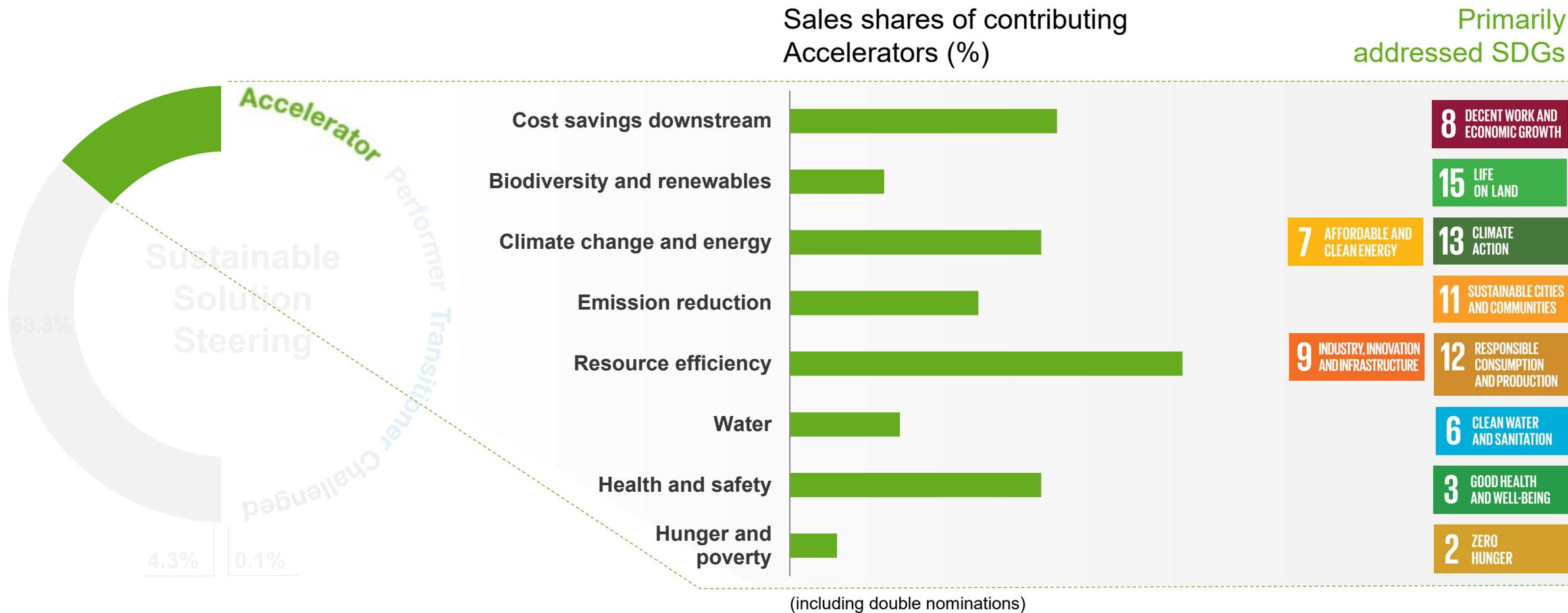


- >60,000 product applications analyzed by 2018 (€56,2 billion in sales, 96,5% of relevant portfolio)
- 27,7% Accelerators
 - >12,000 solutions for enhanced quality of life
 - Strong growth in their markets
 - On average margins ~6 percentage points above the rest of assessed portfolio
- Goal: €22 billion of sales with Accelerator products by 2025 (2018: €15 billion)
- Stronger integration in R&D pipeline, business strategies and M&A projects
- As of 2018, we will stop selling all Challenged products within maximum five years after classification

Target: Increase Accelerator share and phase out “challenged products” maximum 5 years after identification

* >60,000 product applications analyzed

BASF's Accelerators contribute to a wide range of the UN Sustainable Development Goals



Sustainable Solution Steering

Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources



Accelerator Elastoflex® E 3532

Process information

Application: Semi-structural parts for transportation (e.g. trunk floor)

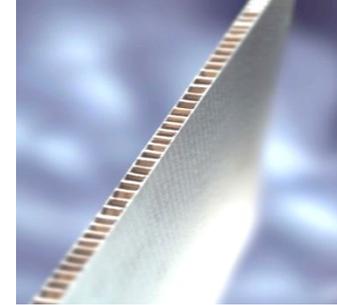
Customer Industry: Transportation

Market: Global

Sustainability performance

- Increased climate protection potential and energy savings
- Increased health and safety behavior
- Cost savings downstream

→ Elastoflex E3532 is the newest product generation for structural parts for transportation



Differentiation potential

Customer:

- Weight reduction
- Lower processing temperature and lower worker exposure
- Shorter shifts

Accelerator Formic Acid

Process information

Application: Runway and road de-icing

Customer Industry: Transportation

Market: Global

Sustainability performance

- Better biodegradability than urea and acetate, therefore reduced chemical oxygen demand
- Reduced water treatment demand and costs

→ Enabling ecoefficient de-icing



Differentiation potential

- Cost savings downstream
- Water scarcity and pollution

Accelerator CIP

Process information

Application: Inductors for computers and electronics

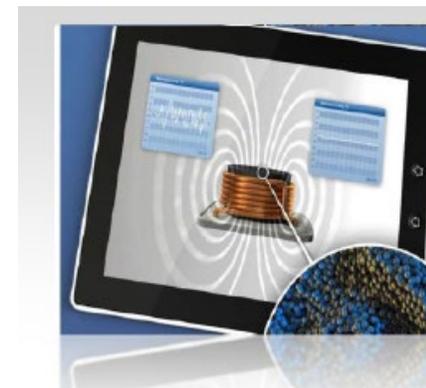
Customer Industry: Electronics, ICT, Automotive, etc.

Market: Global

Sustainability performance

- As core material in inductors, CIP saves energy due to lowest losses compared to other materials.
- Unique solution for computer and electronics inductors being resistant to corrosion
- Eliminates wet chemical coating process, less emissions at customer production sites

→ Unique market position



Differentiation potential

Customer:

- Climate change & energy
- Resource efficiency
- Cost savings downstream
- Pollution (air, soil, noise)

Accelerator MIM

Process information

- Application:** Small metal parts
- Customer Industry:** Various, Engine parts, Automotive, etc.
- Market:** Global

Sustainability performance

- Trade Name Catamold™
- Saves energy and material downstream compared to investment casting for small metal parts.
- Trainings as a service for customers



Differentiation potential

Customer:

- Resource efficiency
- Cost savings downstream

Accelerator Acrodur®

Process information

Application:	Binding agent for natural, synthetic and glass fibers
Customer Industry:	Automotive, Furniture
Market:	Global

Sustainability performance

- Water-based
- Low-emission
- No organic substances are released during cross-linking.
- Safe working atmosphere

→ Acrodur® enables the production of lightweight and sustainable composites.



Differentiation potential

- Light-weight solutions
- Thermo-mechanical stability: up to 220 °C
- High share of renewables: up to 75 % of natural fibers
- Flexibility in design

Accelerator Glysantin® G 64

Process information

Application: Engine coolant

Customer Industry: Automotive

Market: Global

Sustainability performance

- Excellent heat transfer in the engine cooling system
- Improved thermal stability
- Minimizes build-up of deposits
- Excellent corrosion inhibition

→ Next generation engine coolant



Differentiation potential

Customer:

- Cost savings due to reduced maintenance
- Extended lifetime of engine cooling system

Accelerator Irgalube® FE 1

Process information

Application: Lubricant additive

Customer Industry: Automotive

Market: Global

Sustainability performance

- Improved engine performance
- Synergistic effects with ZDDP (zinc dialkyldithiophosphate)
- Higher efficiency compared to GMO (glycerol mono oleate)

→ Improves fuel economy, acceleration and horsepower



Differentiation potential

Customer:

- Improved fuel economy
- Reduced emission (CO₂)
- Based on renewable raw materials
- Ashless additive

Accelerator Synative® ES TMP

Process information

Application: Marine lubricant

Customer Industry: Marine

Market: Global

Sustainability performance

- Superior lubrication performance
- Excellent resistance to oxidation
- Good hydrolytic stability
- Good low-temperature performance
- Broad range of available viscosities

→ Enables the formulation of environmentally acceptable lubricants for marine



Differentiation potential

Customer:

- Reduce impact on the aquatic environment
- Excellent biodegradability
- High renewable content of >80 percent
- Enable OSPAR listing

Accelerator Deoxo[®] Catalysts

Process information

Application: Ozone removal

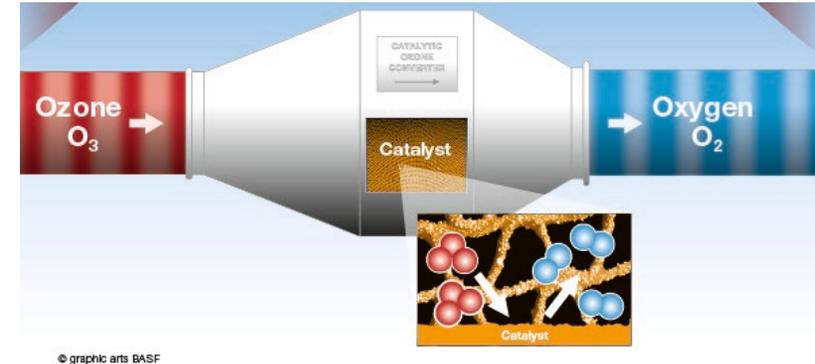
Customer Industry: Aviation

Market: Global

Sustainability performance

- Addresses aircraft cabin air purification: health/safety/comfort of passengers and crew is improved by mitigating exposure to ozone in aircraft cabin air
- Since 1980, BASF has been the leading supplier of ozone removal systems for Boeing, Airbus, Gulfstream, Dassault and many other aircraft

→ Designed to maintain a healthy cabin environment in airplanes



Differentiation potential

Customer:

- Emissions reduction
- Health and safety

Accelerator

Recycling of PGMs (Platinum Group Metals)

Process information

- Application:** Spent catalyst recycling, precious metals recovery
- Customer Industry:** Catalysts
- Market:** Europe, North America



Sustainability performance

- Extracting PGMs through the process of smelting and refining spent automotive and chemical catalysts; results in energy and resource savings
- Provides a sustainable and economically viable secondary source of the world's limited natural resources
- Recycling of end-of-life catalysts for use in new generation catalysts that provide clean air, increased energy efficiency and production yields

→ Recycling and recovery of precious metals for cost effective, sustainable use in a new generation of chemicals and autocatalysts

Differentiation potential

Customer:

- Resource efficiency
- Cost savings downstream
- Emissions reduction (as applied to new generation autocatalysts)

Accelerator PremAir®

Process information

Application: Emissions control catalyst

Customer Industry: Automotive

Market: North America, Korea

Sustainability performance

- Enables automakers to generate exhaust emission credits that derive value in terms of cost reduction of the entire emission control system
- Both, the Air Resources Board of California and U.S. EPA have approved PremAir as a proven ozone reduction catalyst for use in current and future emission control strategies
- Is a base metal catalyst which provides a sustainable and stable raw material supply chain

→ A patented catalyst coating that transforms ground level ozone, the main component of smog, into oxygen by simply driving down the road



Differentiation potential

Customer:

- Emissions reduction
- Cost savings downstream

Accelerator

FWC™ Four-way Conversion Catalyst

Process information

Application: Emissions control catalyst

Customer Industry: Automotive

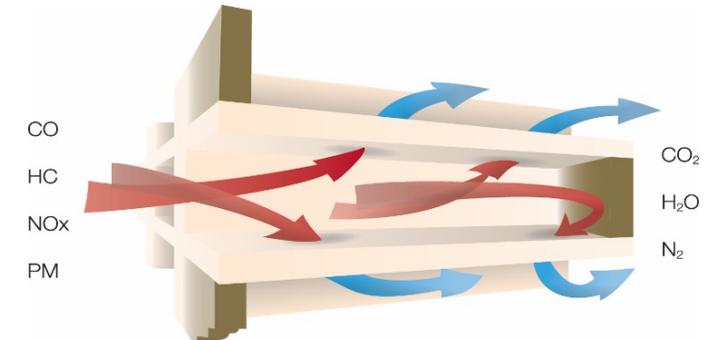
Market: Global

Sustainability performance

- Euro 6, and China Stage 6 regulations enforce, in addition to HC (Hydrocarbons), CO (Carbon Monoxide), and NOx (Nitrogen Oxides), tighter control of PM (Particulate Matter) emissions from gasoline engine powered vehicles
- FWC™ catalyst combines the functionality of a Three-Way Catalyst (TWC) with a filter to remove all four pollutants with just one component
- Lowers backpressure, saves space, ensures particulate emission below tight regulation limits

→ Innovative single-component four-way conversion catalyst that removes multiple pollutants from gasoline engine exhaust

FWC™ principle of operation



Differentiation potential

Customer:

- Emissions reduction
- Cost savings downstream
- Resource efficiency

Accelerator

Three-Way-Catalysts (TWC)

Process information

Application: Emissions control catalyst

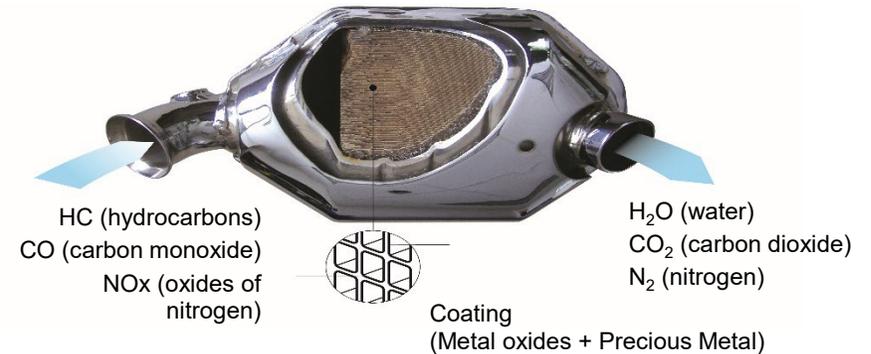
Customer Industry: Automotive

Market: Global

Sustainability performance

- Arguably one of the most meaningful pollution abatement devices; Today, the catalytic converter is a key component of most modern cars around the world.
- Since its inception, TWC technology has prevented over 1 billion tons of Hydrocarbons (HC), Carbon Monoxide (CO) and Nitrogen Oxide (NOx) before they reached the atmosphere.

→ Leading-edge emissions abatement technology that helps auto manufacturers meet increasingly stringent environmental regulations around the world



Differentiation potential

Customer:

- Emissions reduction
- Cost savings downstream
- Resource efficiency

Accelerator

SCR (Selective Catalytic Reduction)

Process information

Application: Emissions control catalyst
Customer Industry: Automotive
Market: Global

Sustainability performance

- Diesel engine emissions are of increasing concern to governments worldwide. Euro 6, China Stage 6 and India BS VI regulations enforce a stricter control of NOx (Nitrogen Oxides) emissions from diesel-engine powered vehicles.
- Lower emission standards drive the requirement for active filter systems in conjunction with NOx reduction technologies; BASF's patented zeolite SCR catalysts exhibit high temperature stability and meet challenging catalyst durability requirements.

→ Patented zeolite SCR catalysts offer very high temperature stability and operating temperature flexibility to remove NOx to meet stringent emission regulations around the globe.



Differentiation potential

Customer:

- Emissions reduction
- Cost savings downstream
- Resource efficiency



Accelerator CathoGuard® 800

Process information

Application:	Cathodic electrocoats for corrosion protection
Customer Industry:	Automotive
Market:	Global

Sustainability performance

- Clear competitive advantage due to high surface quality, best edge protection and excellent throwing power
- CathoGuard 800 is optimally suited for both application types, primer and integrated processes. This ED-coat offers an alternative to tin-containing formulations and already contributes to the durability of millions of cars.
- With an efficient material consumption during the application process, it supports safeguarding resources.

→ An innovative solution for the highest eco-efficiency



Differentiation potential

Customer:

- Cost savings downstream
- Resource efficiency
- Improvement of CO₂ footprint
- Reduction of volatile organic compounds (VOC) emissions
- Health and safety

Accelerator Integrated Process

Process information

Application: OEM Coatings, providing color and effect
Customer Industry: Automotive
Market: Global

Sustainability performance

- With the Integrated Process, the primer functionality gets integrated in the basecoat layer without compromising functionality and aesthetics of the finish.
- A dedicated waterborne basecoat reduces the number of applied layers, leading to shorter coatings processes.
- IP processes have become a global trend, feasible for existing and new car manufacturer paint shop installations.

→ Enabling BASF customers to reduce energy, material and investment cost



Differentiation potential

Customer:

- Cost savings
- Improvement of CO₂ footprint
- Reduction of volatile organic compounds (VOC) emissions
- Resource efficiency

Accelerator PrimeCube®

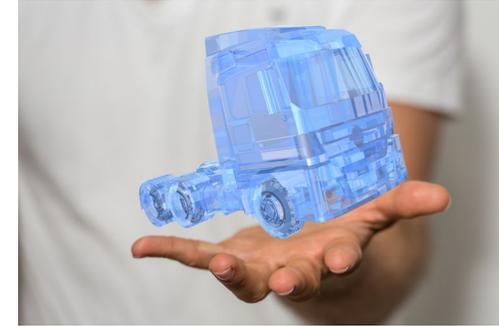
Process information

Application:	Coatings for commercial vehicles
Customer Industry:	Automotive
Market:	Global

Sustainability performance

- PrimeCube is a new BASF Verbund process for coating truck cabins. The enabling material concept with dedicated technologies has been developed by the Coatings division.
- The topcoat ColorPrime is applied directly on the PrimeBloc, generating the first short process for trucks. This allows for a completely new coating process with energy savings up to 40 percent.
- These innovative 2-component PU materials even match volatile organic compounds (VOC) emission values of waterborne products.

→ Sustainable paint system for commercial vehicle coatings



PrimeCube® – BASF Verbund Process for highly efficient performance coatings

Differentiation potential

Customer:

- Cost savings via investment and process (one hit application, no primer oven, lower temperatures)
- Reduced CO₂ emission and volatile organic compounds (VOC)
- Resource efficiency increased due to reduced material consumption, less facility space, less robots

Accelerator

R-M[®] Directfiller Black, White and Grey

Process information

Application: Filler system
Customer Industry: Automotive refinish coatings
Market: EMEA, Asia Pacific

Sustainability performance

- DIRECTFILLER (Black, White, Grey) has superb adhesion properties and excellent corrosion protection, enabling it to be applied to bare steel, galvanized steel and aluminum. By using FLEXPLO, an application on plastic is also possible.
- Extensive reduction of process time by using DIRECTFILLER as a wet on wet process, sparing the need to sand.
- In this way, body shops not only save material for separate priming, they can also skip an entire application step.

→ New filler system – directly on metal



Differentiation potential

Customer:

- Cost savings downstream
- Resource efficiency
- Climate change and energy
- Health and safety

Accelerator

Glasurit® 151-170E Eco Balance UV PRIMER FILLER, GREY

Process information

Application: Rapidly drying primer filler, ideally suited for minor and moderate repair jobs

Customer Industry: Automotive refinish coatings

Market: EMEA

Sustainability performance

- Repairs of minor to moderate damages to car parts are now among body shops' most common repair jobs. They have to work profitably in this segment.
- UV-A technology ensures quicker drying than any other heat source, commonly used in body shops. It therefore enables them to save energy costs and drying time.
- Saves further process times because it eliminates the cooling phase.
- UV-A radiation is the least harmful part of ultraviolet light. This makes the technology safe and easy to use.
- Biomass balanced product: 100 percent of fossil resources are mathematically replaced by renewable resources, the method is subject to third party certification (REDcert²).

→ Boost efficiency at the speed of light



Differentiation potential

Customer:

- Cost savings downstream
- Resource efficiency
- Climate change and energy

Accelerator

R-M® Rapidclear C 2570 eSense

Process information

- Application:** Quick-drying clearcoat with no loss of quality
- Customer Industry:** Automotive refinish coatings
- Market:** EMEA

Sustainability performance

- Needs no flash-off time and provides an excellent finish after a short drying time in the oven at 60 °C panel temperature. It also boasts outstanding drying properties at 40 °C and at room temperature.
- Wide range of applications: excellent polishing characteristics; can be applied to both vertical and horizontal panels
- Biomass balanced product: 100 percent of fossil resources are mathematically replaced by renewable resources, the method is subject to third party certification (REDcert²).

→ Fast-dry and easy use for a wide range of applications.



Differentiation potential

Customer:

- Cost savings downstream
- Resource efficiency
- Climate change and energy

Accelerator Oxsilan®

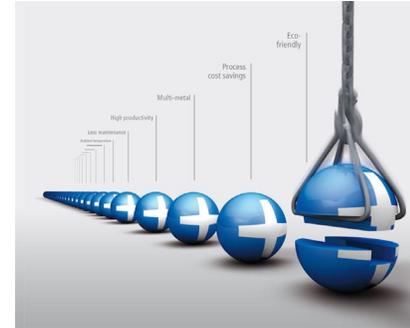
Process information

Application: Multi-metal pretreatment
Customer Industry: Automotive, Appliance, Construction
Market: Global

Sustainability performance

- Oxsilan® is an eco-friendly and multi-metal pretreatment process. The innovative thin-film technology is used likewise for the pretreatment of car bodies and for the automotive component industry as well as for the appliance and construction industries
- High level of corrosion protection and optimal coating pre-treatment
- Lower process costs, higher productivity
- State-of-the-art alternative to conventional zinc-phosphating process
- Almost sludge-free, no need for acidic cleaning

→ More than 8 Million Oxsilan® cars on the road since May 2009



Differentiation potential

Customer:

- Shortened pre-treatment lines, reduced maintenance costs
- Resource efficient, easy bath control
- Health and safety

Sustainable Solution Steering

Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources



Accelerator Neopor®

Process information

- Application:** Insulation
- Customer Industry:** Construction (new buildings and renovation)
- Market:** Europe, North America, South Korea, China

Sustainability performance

- Neopor provides high insulation performance with a small amount of material; This leads to improved resource efficiency compared to white EPS.
- Neopor contributes to cost savings downstream.
- Insulation with Neopor positively contributes to climate protection and energy efficiency.

→ Neopor insulating materials offer improved insulating performance and lower use of materials than conventional EPS

Note: Neopor is produced with a new polymeric flame retardant, substituting former HBCD (substance facing EU-regulatory ban process)



Differentiation potential

- Has improved insulation performance compared to the standard white EPS
- Provides high insulation with less material consumption (up to 50 percent), which allows material cost savings for end customers
- Enables end customers to save more energy with a high performance insulation

Accelerator Styrodur®

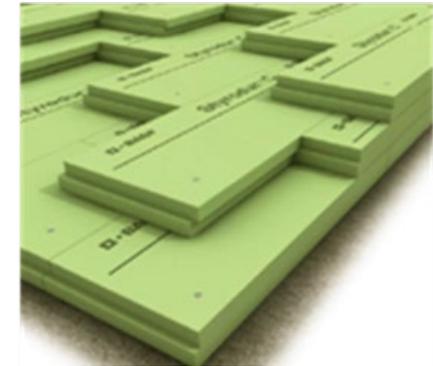
Process information

- Application:** Perimeter and inverted roof insulation
- Customer Industry:** Construction (renovation)
- Market:** Europe

Sustainability performance

- Insulation with Styrodur reduces CO₂ emissions.
- Styrodur applied in the perimeter insulation improves energy efficiency of buildings.

→ Styrodur allows reduction of CO₂ emissions and energy savings due to excellent insulating performance



Differentiation potential

Customer:

- Cost efficient solution for perimeter and inverted roof insulation of houses
- Enables end customers to save energy



Accelerator Elastopir®

Process information

- Application:** PIR system for flame-retardant sandwich elements
- Customer Industry:** Construction/Building
- Market:** Europe

Sustainability performance

- Increased resource efficiency and decreased energy consumption
- Increased health and safety behavior

→ Elastopir is the latest product generation for sandwich elements and insulating panels



Differentiation potential

Customer:

- Low thermal conductivity values
- Extra-high temperature stability, compliant with exacting fire protection standards
- Fulfills requirements of LPS 1181 and EN-13501-2 fire resistance tests

Accelerator Elastopor®

Process information

Application: Sandwich panels with different facings;
Insulation, cooling, storage, transport

Customer Industry: Construction/Building, Appliances

Market: Global

Sustainability performance

- Increased resource efficiency and decreased energy consumption
- High insulation effect even with low material thickness

→ Elastopor is a PU rigid foam which has excellent insulation properties.



Differentiation potential

Customer:

- Extremely low thermal conductivity levels
- Prefabricated panels permit rapid, straightforward installation
- Durable, good insulating properties and simple processing methods

Accelerator Plus

MasterSeal FX 6100/560

Process information

Application: Waterproofing

Customer Industry: Construction, Water management, Infrastructure

Market: Global

Sustainability performance

- Light-weight mortar for increased job site EHS
- Increased yield (m²/kg) reduces emissions for transportation
- High performance waterproofing improves durability of constructions

→ Highly efficient cementitious waterproofing membrane



Differentiation potential

Customer:

- MasterSeal FX 6100: easy to use (1 component) cementitious waterproofing membrane with 85 percent increased yield (area per weight)
- MasterSeal 560: high performance (elasticity @ -20°C) cementitious waterproofing membrane with 40 percent increased yield
- Due to their improved binder system, both products are rapidly curing and enable fast return to service.

Accelerator Plus

MasterSeal NP 100/NP 150

Process information

- Application:** Joint sealants
- Customer Industry:** Construction, Residential and non-residential Buildings
- Market:** Global

Sustainability performance

- Isocyanate free curing to improve job-site environment, health and safety (EHS)
- Low volatile organic compound (VOC) content, suitable for interior use (LEED certified)

→ Isocyanate-free curing hybrid sealant



Differentiation potential

Customer:

- MasterSeal NP100 and NP 150: easy to use (1 component) hybrid sealants with high movement capabilities
- Low modulus sealants that ensure a high durability of the joints even at high movements
- Fast curing and early overpaintability ensure quick installation
- Adhesion to a wide range of building materials

Accelerator Plus

MasterFlow 9000 – Series (9500, 9300, 9800)

Process information

- Application:** Wind turbine grout
- Customer Industry:** Construction, On- and Off-shore wind turbine installation
- Market:** Global

Sustainability performance

- Safe and durable installations
- Fast and cost saving installation
- High energy yield due to low downtimes

→ Fatigue resistant, cementitious grouts for wind turbines



Differentiation potential

Customer:

- High fatigue resistance ensures durability also in very harsh off-shore conditions (cyclic and bending loads)
- Excellent pumpability over long distances
- Excellent freeze-thaw resistance
- Volume stable – zero autogenous shrinkage

Accelerator Plus

MasterSeal 7000 CR (MasterSeal P 770, M 790)

Process information

Application: Waterproofing

Customer Industry: Construction, Water management, Infrastructure

Market: Global



Sustainability performance

- Fast, safe and cost saving installation
- Long-term prevention of water leakage due to high chemical resistance with crack bridging ability
- Faster return to service due to fast curing speed

Differentiation potential

- Unique combination of chemical resistance and crack bridging leading to increased durability of waste water structures
- Moisture tolerance in application, allows wider application window and easier installation (less drying effort)
- Improved environment, health and safety (EHS) performance as the product is solvent free and compared to other solutions low hazard

→ Chemical resistant and crack bridging waterproofing membrane, specifically designed for waste water environments

Accelerator Plus MasterSure

Process information

- Application:** Very long workability retention, rheology control and high early strength
- Customer Industry:** Concrete producers, Ready-mix and projects, Concrete admixtures
- Market:** Global

Sustainability performance

- Robust concrete performance at all temperatures improves durability of concrete
- Improved flexibility in concrete logistics through longer workability times
- Avoidance of additional site installations
- Reduction of concrete rejections and disposals

→ Consistent workability and good early strength safeguard durability of structure



Differentiation potential

- Enables concrete suppliers to safely serve broader markets; Expertise of concrete mix optimization service lead to a cost effective (self-consolidating) concrete.
- Fully compatible with MasterGlenium and MasterEase premium plasticizers

Accelerator MasterFiber

Process information

- Application:** Reinforcement for Concrete
- Customer Industry:** Precast manufacturer, Underground construction, General concrete producer
- Market:** Global

Sustainability performance

- Replaces steel wire reinforcement which reduces risks/hazards associated with concrete placement
- Enhances the durability of concrete by reducing crack widths typically due to plastic shrinkage, long term drying shrinkage and thermal changes
- Non-corroding reinforcement lowers life cycle costs for maintenance and repair

→ Enhanced concrete durability through reduced cracking



Differentiation potential

- Provides three dimensional reinforcement integral to the concrete mixture
- Reduces crack widths associated with steel wire reinforcement
- Eliminates job site steel wire inventory and placement

Accelerator MasterGlenium®

Process information

- Application:** High performance concrete
- Customer Industry:** Concrete producers, Concrete admixtures
- Market:** Global

Sustainability performance

- Enables reduction of cement content in concrete
- Enables decrease of carbon footprint and environmental impact of buildings
- High performance concrete improves durability of constructions

→ Modern superplasticizer for total performance control of concrete



Differentiation potential

- MasterGlenium products can be tailored to the specific needs of a project or a customer production site.
- Control of workability retention of concrete to ensure perfect performance of concrete upon delivery on site.

Accelerator MasterMatrix SDC

Process information

- Application:** Highly workable concrete for speedy and ergonomic concrete placing
- Customer Industry:** Concrete producers, Ready-mix and projects, Concrete admixtures
- Market:** Global

Sustainability performance

- Design of concrete mixtures to enable high fluidity of concrete for fast pumping and placing
- Improved ergonomics and safety on site
- Reduced noise levels
- Extended life-cycle of buildings
- Avoids heavy increase of cementitious materials usually required to achieve performance profile

→ Performance package to enable concrete construction to be faster, safer and more ergonomic



Differentiation potential

- MasterMatrix product and expertise of concrete mix optimization service lead to a cost effective self consolidating concrete.
- Fully compatible with MasterGlenium and MasterSure premium plasticizers

Accelerator Smart Dynamic™ Concrete

Process information

- Application:** Highly workable concrete for speedy and ergonomic concrete placing
- Customer Industry:** Concrete producers, Ready-mix and projects, Concrete admixtures
- Market:** Global

Sustainability performance

- Design of concrete mixtures to enable high fluidity of concrete for fast pumping and placing
- Improved ergonomics and safety on site
- Reduced noise levels
- Extended life-cycle of buildings
- Avoids heavy increase of cementitious materials usually required to achieve performance profile

→ Performance package to enable concrete construction to be faster, safer and more ergonomic



Differentiation potential

Customer:

- MasterMatrix product and expertise of concrete mix optimization service lead to an cost effective self consolidating concrete.
- Fully compatible with MasterGlenium and MasterSure premium plasticizers

Accelerator Master X-Seed®

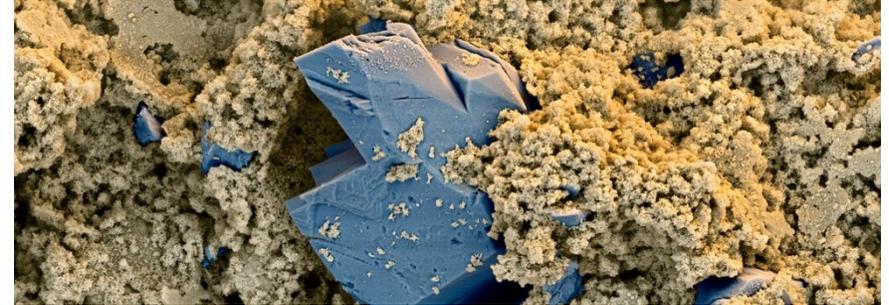
Process information

- Application:** Advanced concrete hardening accelerator
- Customer Industry:** Concrete producers, Ready-mix and precast, Concrete admixtures
- Market:** Global

Sustainability performance

- Shortened process cycles, more flexible capacity utilization and increased efficiency help to save time and reduce costs
- Allows the use of more supplementary cementitious materials with reduced CO₂ emissions during the production phase
- Energy savings and reduction of CO₂ by eliminating the need of heat curing

→ Facilitating efficient concrete applications even at low temperatures without need of heat curing – saving energy, time and costs



Differentiation potential

Customer:

- Innovative and patent protected technology by BASF; significantly accelerates concrete hardening at early stages of curing
- Quality improvement of the hardened cement paste, providing durability, aesthetics and eco-efficiency benefits
- Technology does not interfere adversely with the final hardness and service life of the concrete
- Reliable concrete pouring at low outside temperatures

Accelerator Green Sense®

Process information

- Application:** Performance package for more economical and environmentally friendly concrete
- Customer Industry:** Concrete producers, Ready-mix and precast, Concrete admixtures
- Market:** Global

Sustainability performance

- Formulations of concrete mixtures that contain a high proportion of recycled materials
- Decrease of carbon footprint and environmental impact of buildings
- Extended lifecycles of buildings

→ Unique performance package that optimizes concrete mixtures with regard to environmental friendliness, performance and production costs



Differentiation potential

Customer:

- MasterGlenium product and expertise of concrete mix optimization service lead to an environmentally preferred building material, proven by e.g. LEED and DGNB certification.
- Eco-efficiency analysis from BASF proves the economic and ecological benefits of Green Sense Concrete over the entire lifecycle of a building in comparison with conventional products and processes.

Accelerator Neopentyl Glycol

Process information

Application: Powder Coatings Resins

Customer Industry: Automotive, Construction

Market: Global

Sustainability performance

- Bio based Neopentyl Glycol used in mass balance
- Using a mass balance approach, BASF is replacing a certain amount of fossil raw materials with renewable feedstock.
- The method is subject to third party certification (REDcert²).

→ Contributing to use renewable feedstocks in the mass balance approach



Bio-naphtha
delivery

Differentiation potential

- Biodiversity and renewables

Accelerator Acronal® ECO 6270

Process information

Application: Universal binder for solvent-free interior and exterior decorative paints

Customer Industry: Paints and coatings

Market: Europe

Sustainability performance

- Low odor
- Water-based
- For solvent-free, low volatile organic compounds (VOC)-paints
- Ammonia-free
- Formaldehyde-free

→ Acronal ECO 6270 for health-friendly and environmentally advanced paints



Differentiation potential

- Outstanding weather resistance
- High pigment binding power
- Universal character for interior and exterior applications
- Improves stain resistance and cleanability

Accelerator

Acronal® EDGE 6295

Process information

Application: Binder for exterior paints and textured finishes on mineral substrates
e.g. masonry paints

Customer Industry: Paints and coatings

Market: Europe

Sustainability performance

- Water-based solution
- Better durability and longer renovation cycles
- Excellent hydrophobicity and rain protection



Differentiation potential

- Superior color retention
- Excellent exterior durability
- Broad formulation latitude

→ Acronal EDGE 6295 for premium exterior paints with superior performance

Accelerator Mattex[®] PRO

Process information

Application: High performance extender
Customer Industry: Paints and coatings
Market: Global

Sustainability performance

- Replace Diatomaceous Earth (DE) in architectural coatings formulations or as TiO₂ extender
- Crystalline silica free
- Simplify paint formulation by eliminating the use of flattening agents
- Help to achieve high scrub resistance by 30 percent in low volatile organic compounds (VOC) films

→ Simpler formulations and same high-performance results with less TiO₂



Differentiation potential

Customer:

- Cost saving downstream
- Resource efficiency
- Health and safety
- Climate change and energy

Accelerator

Suvinil® Acrylic Antibacterial

Process information

Application: Wall paint
Customer Industry: Decorative paints
Market: South America

Sustainability performance

- Eliminates 99 percent of the microorganisms on the surface of any wall and prevents them from returning for two years
- The paint can be washed without compromising the effect, making it ideal for use in nurseries, hospitals and schools.
- It is available in a wide range of colors and allows for individual design.

→ Protection from microorganisms: Suvinil Acrylic Antibacterial allows a healthier environment at home.



Differentiation potential

- The effectiveness of the paint has been approved according to the parameters of JIS 2801:2000 (Japanese Industrial Standard) for antimicrobial products.
- Suvinil Acrylic Antibacterial is the first paint to get approval from Anvisa (Brazil's National Health Surveillance Agency), which certifies its safety and effectiveness.

Sustainable Solution Steering

Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources



Accelerator Elastocool® Advanced 2030

Process information

- Application:** PU system for insulation of fridges and freezers
- Customer Industry:** Household appliances
- Market:** Global

Sustainability performance

- Increased climate protection potential and energy savings
- Increased resource efficiency
- Cost savings downstream

→ Elastocool Advanced is the latest product generation of insulation material for fridges & freezers.



Differentiation potential

- Lower thermal conductivity of $\sim 0,5$ mW/mK which enables the achievement of energy efficiency classes A++ and A+++
- Faster cycling time due to better demolding behavior which leads to higher output in the production (efficiency increase)
- Higher compressive strength values lead to lower material consumptions per unit (fridge, freezer)

Accelerator ecovio® F 2371 (peepoo®)

Process information

Application:	Peepoo bags
Customer Industry:	Consumer goods
Market:	Global

Sustainability performance

- Biodegradability: enables composting of human wastes which helps enriching depleted soil
- Valuable nutrients for farming as a substitute for fertilizers enable energy savings and resource efficiency.
- Helps achieving safety and health standards beyond industry level

→ ecovio for peepoo supports sustainable social welfare by driving the purpose of offering access to sanitation via a public-private partnership business model.



Differentiation potential

- Differentiation potential
- Cost savings downstream
- UN Millennium Development Goals (#7)
- Resource efficiency
- Water scarcity and pollution
- Biodiversity and renewables
- Health and safety

Accelerator Styropor® BMB

Process information

Application: Protection and insulation
Customer Industry: Packaging
Market: Europe

Sustainability performance

- Is the EPS (expandable polystyrene) produced using BASF's biomass balance approach
- The fossil resources needed to manufacture Styropor are replaced entirely with renewable resources at the very beginning of the production value chain.
- Each biomass balance product helps to conserve fossil resources and reduce greenhouse gas emissions. The quality of Styropor BMB is unchanged compared to its fossil counterpart.

→ Styropor BMB contributes to resource conservation while keeping its technical properties intact.



Differentiation potential

Customer:

- Helps packaging manufacturers meet the industry's high sustainability requirements. Their products are delivered in excellent thermal insulation packaging.

Accelerator

Epotal[®] FLX, Epotal[®] CF

Process information

Application: Lamination adhesives for flexible packaging

Customer Industry: Packaging

Market: Global

Sustainability performance

- Water-based alternative to traditional solvent-based and solventless adhesives
- Helps to keep food clean: no formation of primary aromatic amines (PAA), no aromatic isocyanates
- Helps to make workplaces healthier and safer
- Very low residual odor and taste

→ Water-based lamination adhesives for more sustainable flexible packaging



Differentiation potential

- Cost reduction
- Time saving
- Increased flexibility

Accelerator Renewable PolyTHF®

Process information

Application: Spandex, TPU, elastomers

Customer Industry: Textile, plastics

Market: Global

Sustainability performance

- Value chain based on the direct fermentation of renewable resources by high-performing microorganisms
- The production process of renewable PolyTHF® precursor relies on a patented technology from Genomatica (GENO BDOTM).
- Ecologically attractive alternative to petrochemical raw materials

→ Contributing to use renewable feedstock

July 2018



Differentiation potential

- Biodiversity and renewables
- Climate change and energy

Accelerator acResin®

Process information

Application: Adhesives raw material for pressure-sensitive adhesives (PSA) in the tape and labeling industries

Customer Industry: Automotive, Construction, Medical, Food, Beverages, Cosmetics

Market: Global

Sustainability performance

- Minimal volatile organic compounds (VOC) emissions (no added solvents)
- Skin-friendly and low allergenic
- Superior eco-efficiency performance compared to solvent based alternatives for PSA

→ acResin for high-performance adhesives with significant sustainability benefits

July 2018



Differentiation potential

- Suited for extremely transparent adhesive films
- Outstanding resistance to aging; resistance to water whitening
- Conformance with food safety regulations
- Dedicated technical service and coating center for optimizing tailor-made products

Accelerator

Biobased Succinic Acid

Process information

Application: Polyesters, polyurethanes

Customer Industry: Plastics

Market: Global

Sustainability performance

- Process based on renewable resources and high performing proprietary micro-organism, capturing CO₂
- Economically and ecologically attractive alternative to petrochemical raw materials

→ Contributing to use renewable feedstocks

July 2018



Differentiation potential

- Biodiversity and renewables

Accelerator

Joncryl® FLX product line

Process information

Application:	Flexible packaging inks
Customer Industry:	Consumer goods, Resins, Printing, Packaging
Market:	Global

Sustainability performance

- Conversion to water based technology, replacing solvent
- Enable lighter packaging

→ This water based product also enables the creation of a lighter packaging



Differentiation potential

- Cost savings downstream
- Climate change and energy
- Pollution
- Resource efficiency
- Health and safety

Accelerator Hexamoll® DINCH

Process information

- Application:** Medical devices, toys, food packaging, flooring, wall covering, sport and leisure products
- Customer Industry:** Medical, Toys, Food, Construction, Consumer goods
- Market:** EMEA, Asia Pacific, North America

Sustainability performance

- A unique performance comes along with an excellent toxicological profile and low migration rate.
- Approved and certified by many competent authorities and institutions worldwide
- Established since 2002 for applications with close human contact

→ Hexamoll® DINCH - the trusted non-phthalate plasticizer



Differentiation potential

- Alternative non-phthalate plasticizer
- Excellent toxicological profile
- Award winning plasticizer (e.g. ICIS Innovation Award 2006, BASF Innovation Award 2006, Solvin Award 2013)
- Trusted by leading brand owners and retailers

Accelerator

Oil palm based cosmetic ingredients

Process information

Application: Various personal care products
Customer Industry: Personal care
Market: Europe, Asia, USA

Sustainability performance

- In 2018 a major part of the cosmetic specialties portfolio is shifted and will be exclusively offered as Roundtable on Sustainable Palm Oil (RSPO) certified sustainable ingredients to the personal care market.
- Shift of a portfolio of this size and complexity for the first time to foster market transformation

→ Enables customers to meet market demands for finished products based on certified sustainable palm kernel oil (CSPKO)



Differentiation potential

Customer:

- Claim regarding sustainable sourcing possible
- Supports our customers own path to sustainable development

Consumer:

- Contribution to sustainable sourcing of ingredients

Accelerator

Glucan[®] Kera P-LM

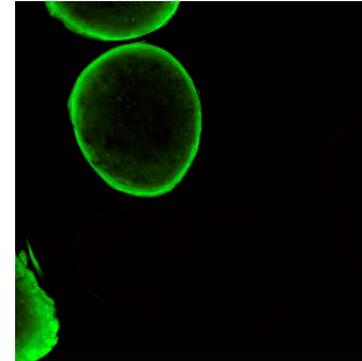
Process information

Application:	Microprotein for deep penetration, protection, hair strengthening, rejuvenation in hair care products
Customer Industry:	Personal care
Market:	Global

Sustainability performance

- 100 percent derived from renewable feedstock
- Enzymatic process (non-genetically modified organisms, GMO)
- Due to benzoic acid preservation and non-GMO enzymes, suitable for all natural and organic cosmetic standards and for vegan concepts
- COSMOS approved

→ Microprotein with significant performance and sustainability impact



Differentiation potential

Customer:

- Climate change and energy
- Alternative to natural keratin

Consumer:

- Health
- Improved hair condition

Accelerator Rheocare® XGN

Process information

Application: Thickener and stabilizer with suspending properties for a variety of personal care products incl. styling and oral care

Customer Industry: Personal care

Market: Global

Sustainability performance

- 100 percent based on renewable feedstock
- Enzymatically hydrolyzed
- Non-genetically modified organisms (GMO) source and process
- Unpreserved
- COSMOS compliant and suitable for many other labels including vegan labels

→ Multifunctional non-GMO and vegan Xanthan gum



Differentiation potential

Customer:

- Renewable, vegan suitability
- Cristal clear formulations possible

Consumer:

- For natural, organic and vegan products

Accelerator Cetiol® Ultimate

Process information

Application: Ultra-fast spreading emollient for face/body/
sun care and color cosmetics

Customer Industry: Personal care

Market: Global

Sustainability performance

- 100 percent renewable-based and volatile emollient
- Replacement of volatile silicones possible
- Easier to use than volatile hydrocarbons
- Readily biodegradable
- Gives more flexibility in the development of natural cosmetic concepts for improved skin feel

→ Regarded as breakthrough innovation and was awarded with market prizes



Differentiation potential

Customer:

- Plant based chemistry for possible cyclomethicone substitution
- New formulation textures and claims possible

Consumer:

- New natural cosmetic concepts

Sustainable Solution Steering

Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources



Accelerator Natugrain® TS

Process information

- Application:** Feed additive
- Customer Industry:** Livestock production, Animal nutrition
- Market:** Global

Sustainability performance

- Improved nutrient digestion with impact on litter quality (water resorption): Natugrain®TS feed enzyme contains highly purified NSP-degrading enzymes for a better digestibility. This improves the use of feed components in poultry and swine and enables animals to metabolize more energy.
- Improved feed conversion rate with lower quality feed or by-products: A higher nutrient digestion of plant-derived feed components can result in higher financial benefits.

→ Improvement of feed conversion



Benefits

- High efficacy: Adding Natugrain®TS to pig and poultry diets is a valuable and reliable improvement to animal diets with the potential to reduce costs.
- High product quality and stability: BASF's enzymes are produced using the best quality management standard possible.

Accelerator Natuphos® E

Process information

- Application:** Feed additive
- Customer Industry:** Livestock production, Animal nutrition
- Market:** Global

Sustainability performance

- Increase efficiency and minimize emissions: Up to 30 percent less phosphorus excretion and up to 60 less zinc excretion.
- Improve feed conversion rate with lower quality feed or by-products: Less feed needed, lower resource consumption and higher efficiency.

→ The most proven Phytase for improved feed conversion



Benefits

- Efficiency gains: Adding Natuphos® to animal diets is an improvement for animal diets with the potential to lower resource consumption, emissions and costs.
- High product quality and stability: BASF's enzymes are produced with the highest quality management standard.

Accelerator Luprosil[®], Amasil[®]

Process information

Application: Feed additive
Customer Industry: Livestock production, Animal nutrition
Market: Global

Sustainability performance

- Luprosil[®] in silage prevents the formation of molds and thereof reduces feed losses during storage.
- Amasil[®] reduces the pH-level in basic feed ingredients, compound feed and drinking water. This creates a less favorable environment for microorganisms (e.g. salmonella or other gram negative bacteria).
- Stabilization of feed and raw material during storage enables users to buy higher quantities of feed more flexibly, e.g. when feed prices are low.

→ Reduction of spoilage and improved feed hygiene



Benefits

- Protect feed quality effectively: BASF's organic acids protect feedstuff against microorganisms, reduce feed losses and preserve the high value of mixed-feed (worldwide rise in the price).
- Optimize production: Improved feedstuff hygiene can relieve the burden on animals' immune systems, making it possible to achieve optimal production.

Accelerator

Vitamin A Food Fortification

Process information

- Application:** Food fortification
- Customer Industry:** Food additives, Human nutrition
- Market:** Global

Sustainability performance

- Fight vitamin A deficiency in developing countries: Prevention of blindness, weak immune system and child mortality as well as ensuring maternal health.
- High stability during storage: Due to anti-oxidants, vitamin A remains maximally effective when added to food and is robust even under extreme climatic conditions.

→ Improvement of human living conditions with an economical solution



Benefits

- Contribute to the UN millennium goals: By enriching cheap staple foods like sugar, flour, oil and milk with vitamin A, BASF is tackling malnutrition and improving public health and quality of life.
- Encourage effective application and realization: The “mini laboratory kit” allows food producers to easily check if they are adding the correct amount of Vitamin A to products.

Accelerator PronovaPure[®] Omega-3 oils

Process information

Application: Human nutrition, dietary supplements
Customer Industry: Dietary supplements, Human nutrition
Market: Global

Sustainability performance

- Minimize bio-diversity impact:
Sourcing directly from healthy stocks, e.g. sardines from Peru in line with seasonally adjusted quotas
- High concentration, highly efficient:
Less material needed to gain effect

→ Combining purity with a good peace of mind



Benefits

- High purity standards:
Exceeding quality & regulatory standards for food/pharma
- Less costs per serving:
Highly concentrated products mean higher value creation

Accelerator Crosspure®

Process information

Application: Human nutrition
Customer Industry: Beverage
Market: Global

Sustainability performance

- Reduced solid waste:
Up to 75 percent reduction over the whole life cycle and up to 15 percent for filtration
- Lower water emissions:
20 percent reduction

→ Contributing to sustainability while saving costs

without with Crosspure



Benefits

- Safe product handling
- Lower costs per hl:
Through reusability of material and reduced energy costs

Accelerator Kollidon® Products

Process information

Application: Formulation of pharma products
Customer Industry: Pharma
Market: Global

Sustainability performance

- Increase resource efficiency and reduce waste:
Aluminum free PeroXeal packaging and stable formulation
- Improved bioavailability:
Enables lower dosages

→ More sustainable binding process – combining tradition with innovative solutions



Benefits

- Supporting dry binding process:
Improved process: no solvent and drying, no reaction risk of active pharmaceutical ingredient (API)
- Supporting an efficient hot melt extrusion (HME) process:
Better processing and formulation for shelf-life extension

Accelerator Kollicoat® Products

Process information

Application: Formulation of pharma products

Customer Industry: Pharma

Market: Global

Sustainability performance

- Increase resource efficiency and reduce waste:
 - No plasticizers needed
 - Improved storability: storable in different humidity conditions and defect rate reduction (e.g. Kollicoat® protect)

→ Designed to be safe – more sustainable coating process



Benefits

- Process efficiency:
Easier and faster to handle, reduced formulation complexity
- Cost efficiency:
Flexible production and improved productivity, leading to up to 60 percent lower costs for tableted costing material of processing.

Accelerator

Omega-3 oils – e.g. PronovaPure®

Process information

Application: Dietary supplements, pharma products
Customer Industry: Human nutrition, Pharma
Market: Global

Sustainability performance

- Minimize bio-diversity impact:
Sourcing directly from healthy stocks, e.g. sardines from Peru in line with seasonally adjusted quotas
- High concentration, highly efficient:
Less material needed to gain effect

→ Combining purity with a good peace of mind



Benefits

- High purity standards:
Exceeding quality and regulatory standards for food/pharma
- Less costs per serving:
Highly concentrated products mean higher value creation

Accelerator Interceptor®

Process information

- Application:** Insecticide treated mosquito nets
- Customer Industry:** Public health
- Market:** Africa, Asia, South America

Sustainability performance

- Offer protection, especially at night, from mosquitoes that spread malaria
- With Interceptor nets, users no longer need to regularly retreat their nets with insecticide, thus reducing exposure and risk of contamination.

→ Long-term effectiveness against mosquitoes which demonstrates a fusion of BASF's expertise in textile technology and insect control



Differentiation potential

- Simple, inexpensive self-protection
- Tested and recommended by WHO
- Meets international safety standards for protecting babies, children and adults
- Long-lasting – up to 3 years and 20 washes
- Effective – knocks down and kills mosquitoes upon contact

Sustainable Solution Steering

Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources



Accelerator ecovio® M 2351

Process information

Application: Mulch film
Customer Industry: Agriculture
Market: Global



Sustainability performance

- Biodegradability
- Resource efficiency and water savings over time (higher yields by avoiding white pollution)
- Avoiding emissions of toxic substances from open burning of polyethylene (PE) mulch film
- Waste reduction, avoiding soil displacement

Differentiation potential

- Cost savings downstream
- Pollution (air, soil)
- Resource efficiency
- Climate change and energy
- Biodiversity and renewables

→ Over time, ecovio® biodegradable mulch film helps to avoid adverse consequences of the white pollution in agriculture such as crop yield decrease and water savings.

Accelerator M-99-SP 1

Process information

Application: Crop protection

Customer Industry: Agriculture

Market: US, Europe

Sustainability performance

- Chemically and toxicologically inert
- Protects fruit from yield-robbing sunburn, reducing sun damage by up to 50 percent
- Cool canopy, increasing photosynthesis to maximize yield
- Repel some insects, certified for organic use in the US and Europe

→ Improve overall plant health and therefore productivity



Differentiation potential

Customer:

- Biodiversity
- Resource efficiency
- Health and safety
- Climate change and energy

Accelerator

Tinuvin® NOR 371

Process information

Application: Hindered amine light stabilizer (HALS)

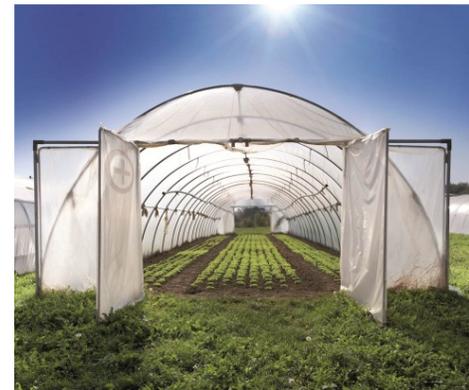
Customer Industry: Agriculture

Market: Global

Sustainability performance

- High molecular weight hindered amine NOR stabilizer with outstanding stabilization of agricultural films even in presence of chemicals such as pesticides, insecticides or soil disinfection agents
- Outstanding performance also as long-term thermal stabilizer contributing to resource efficiency

→ Highly effective stabilizer of agricultural films



Differentiation potential

Customer:

- Cost savings downstream
- Resource efficiency

Accelerator Propionic Acid

Process information

Application: Feed preservation

Customer Industry: Agriculture

Market: Global

Sustainability performance

- Reducing energy consumption and green house gas emissions for feed preservation
- Substitutes conventional heat drying

→ Enabling environmentally friendly feed preservation



Differentiation potential

- Cost savings downstream
- Climate change and energy
- Resource efficiency

Accelerator Nealta[®], Sultan[®]

Process information

Application: Foliar miticide
Customer Industry: Agriculture, Farming
Market: North America, South America

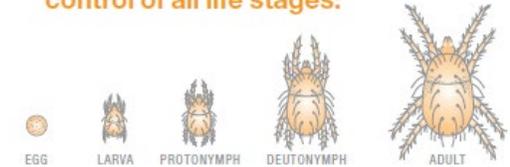
Sustainability performance

- Provides today's growers with a novel high performing miticide that can be the foundational tool for their integrated pest management and resistance management programs while providing favorable safety to beneficials

→ Foundational tool for Integrated Pest and Resistance Management programs



Delivers rapid and effective control of all life stages:



Differentiation potential

- Novel mode of action
- Strong and competitive performance on mites
- Controls all life stages of mites (eggs, nymphs, adults)
- Favorable safety to beneficials

Accelerator RAK®

Process information

Application: Pheromone dispenser
Customer Industry: Agriculture, Farming
Market: Europe, South America

Sustainability performance

- RAK pheromone dispenser disrupts the mating of certain species of moths, helping wine growers with grape yield while at the same time preserving biodiversity and the sensitive balance of the ecosystem.

→ Zero residue/impact system allows wine growers to balance the ecosystem, while protecting their vineyards



Differentiation potential

- Alternative method to protect vineyards against pests
- Ecosystem remains balanced and biodiversity preserved
- Zero impact to beneficial arthropods and pollinators, including bees
- Reduces insecticide resistance
- Zero-residue product

Accelerator Serifel® Biological Fungicide

Process information

Application: Foliar, soil drench
Customer Industry: Agriculture, Farming
Market: North America, South America

Sustainability performance

- Based on a beneficial bacterium, combines multiple modes of action to provide a shield of protection against crop diseases
- Favorable environmental profile, gives growers flexibility in application timing, and helps ensure a marketable crop that will meet even the most stringent retail or trade requirements
- Good fit in integrated pest management (IPM) programs

→ Empowering growers with smart choices to succeed in modern crop protection



Differentiation potential

- Multiple novel modes of action
- Offers a viable pure spore formulation with low application rate and greater stability than competitor biological fungicide product
- Strawberries sprayed solely with Serifel result in a 65 percent marketable yield increase.

Accelerator Limus[®] Nitrogen Stabilizer

Process information

Application: Soil

Customer Industry: Agriculture, Farming

Market: North America, South America, Asia

Sustainability performance

- Prevents urea from being broken down to ammonia allowing time for rainfall to move urea into the soil where it is more protected
- Allows plants to efficiently utilize Nitrogen; crop yield potential increases up to 12 percent greater return on investment for growers
- Reduces ammonia losses significantly by up to 90 percent

→ Enhanced nitrogen use efficiency for optimal plant nutrition



Differentiation potential

- Patented combination of two urease inhibitors (30 percent more effective than a single inhibitor)
- Greater on-urea stability allowing more efficient application, storage and transportation of fertilizers under a wide range of temperatures and humidity
- Flexibility to use with urea or urea ammonium nitrate solutions

Sustainable Solution Steering

Accelerator Examples

1. Transportation
2. Construction
3. Consumer Goods
4. Health & Nutrition
5. Agriculture
6. Energy & Resources



Accelerator OASE®

Process information

Application: Gas treatment

Customer Industry: Oil and gas

Market: Global

Sustainability performance

- OASE purple removes carbon dioxide and hydrogen sulfide in natural-gas applications.
- OASE white enables the treatment of gases containing hydrogen and/or carbon monoxide for applications such as ammonia, iron-ore and many more.
- OASE yellow selectively removes sulfur components from natural gas as well as acid-gas enrichment (AGE) or tail-gas treatment (TGT) units.
- OASE green enables the treatment of fermentation based gas and reduces the consumption of chemistry by 3-4 times.
- OASE blue is used for carbon capture and storage.

→ Enabling innovative gas treatment



Differentiation potential

- Emission reduction
- Cost saving downstream
- Climate change and energy
- Resource efficiency

Accelerator Baxxodur[®] EC 301

Process information

Application: Wind blades
Customer Industry: Renewable energy
Market: Global

Sustainability performance

- Wind energy as important renewable energy source
- Epoxy systems essential for cost-competitive large wind blades manufacturing

→ Enabling wind energy for low carbon electricity production



Differentiation potential

- Climate change and energy

Accelerator BasoMSA

Process information

Application:	Scale removal and acid matrix applications
Customer Industry:	Production and stimulation, Oilfield
Market:	Global

Sustainability performance

- Odorless and creates no dangerous volatiles
- Lower vapor pressure than traditional strong acids
- Readily biodegradable in OECD 301, 306 and 311 tests
- CEFAS¹ registered for the use in Offshore Oil & Gas industry
- BASF manufacturing process safer than the conventional route (chlorine oxidation)

¹ Centre for Environment , Fisheries and Aquaculture Science

→ Combines superior performance with excellent environmental and safety profile



Differentiation potential

Customer:

- Health and safety
- Biodegradability
- Extended lifetime of equipment due to its better corrosion profile

Accelerator Rheomax[®] ETD

Process information

Application:	Tailings management
Customer Industry:	Mining
Market:	Global

Sustainability performance

- Rapid reclamation of process water for reuse
- Drying time of tailings accelerated, resulting in a smaller land footprint
- Quicker rehabilitation time due to faster trafficable surface
- Dry surface leads to improved dust suppression

→ Reduces the environmental footprint of mining operation



Differentiation potential

Customer:

- Cost savings associated with improved water recovery and quicker rehabilitation time
- Reduce fresh water consumption
- Faster rehabilitation of land
- Lower air pollution

Accelerator Rheomax[®] DR

Process information

Application:	Thickener applications
Customer Industry:	Mining
Market:	Global

Sustainability performance

- Improved water recovery at the thickener to be reused in the process
- Volume of waste water, and as consequence the residue footprint, are reduced
- CCD* washing efficiency is increased and recovery of leached metal is improved
- Energy can be saved due to reduced pumping pressure

*Counter Current Decanter

→ Maximizes recovery of water and valuables



Differentiation potential

Customer:

- Savings in the cost of recovery or replenishment of process water can be achieved
- Reduce fresh water consumption
- Enable waste reduction
- Improved resource efficiency
- Reduce energy consumption



Accelerator Lupromin[®] FP 18 AS

Process information

Application: Flotation collector
Customer Industry: Mining
Market: Global

Sustainability performance

- Improved biodegradability
- Higher selectivity (lower losses of valuable material)
- Faster flotation kinetics (lower energy consumption)

→ Combines higher selectivity with excellent biodegradability



Differentiation potential

Customer:

- Biodegradability
- Cost savings (mining and energy)
- Reduction of emissions into water



We create chemistry