

Mining Solutions

Innovative Solutions for
Tailings Management



 **BASF**

We create chemistry

General background



BASF's Mining Solutions business offers a diverse range of mineral processing chemicals and technologies to improve process efficiencies and aid the economic extraction of scarce resources.

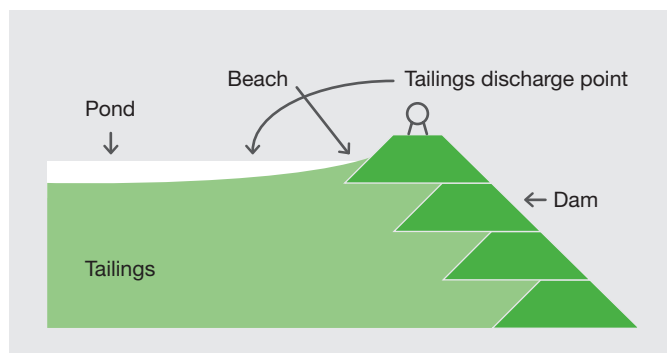
We provide advice and technical expertise to the mineral processing industry worldwide. Our global team is driven by a common goal to provide the best solution to meet our customers' processing needs. With technical representation in over 100 countries, BASF provides expertise on a local basis.

Our offer includes reagents, equipment, process technologies and expertise, focusing on applications such as solid liquid separation, solvent extraction, tailings management, flotation, grinding and materials handling.

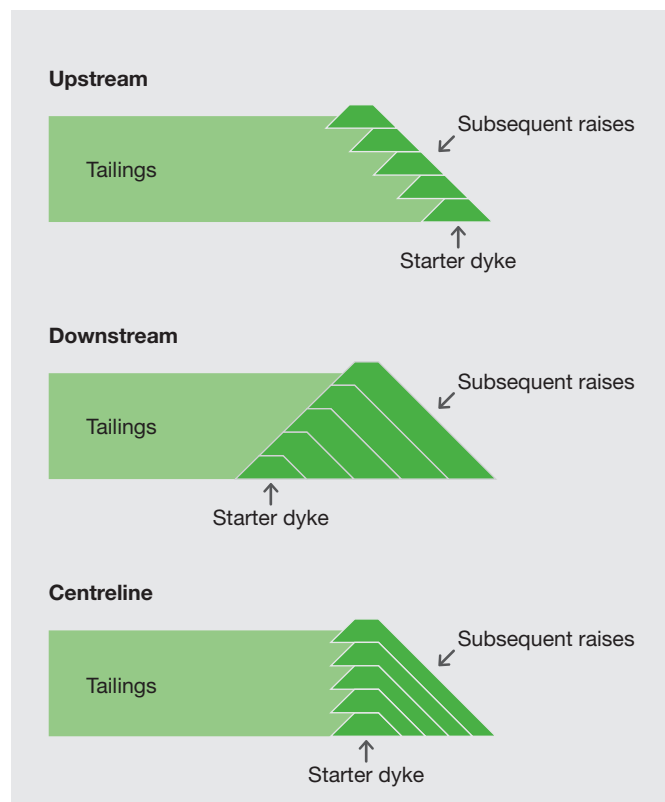
BASF's Tailings Management Team offers a total package, which includes innovative technology coupled with a broad range of reagents, expert consultation, pilot scale and full size engineering equipment, supply and commissioning services together with on-site technical and commercial support.

Our aim is to provide innovative sustainable solutions to ensure our customers' operations run more efficiently delivering operational, economic and environment benefits.

Tailings deposition



Typical tailings dam construction



Enhanced Tailings Disposal (ETD)

Enhanced Tailings Disposal is a method of Tailings Management in which novel technology is used to change and control the structural and drainage properties of mineral processing residues.



Tailings thickeners generate high-density underflows with high yield stress, which are often pumped long distances to a final tailings impoundment area. The tailings are then deposited, dried and eventually rehabilitated.

The ETD process is able to rigidify tailings at the point of disposal by initiating instantaneous water release from the treated slurry. This accelerates the drying time of the tailings, results in a smaller tailings footprint and allows the released water to be returned to the process faster.

This treatment has been found to be effective in improving tailings properties from a wide cross-section of industries, including Alumina, Nickel, Gold, Iron Ore, Mineral Sands, Oil Sands and Copper, amongst others.

Benefits delivered by rigidifying tailings section

Economical	<ul style="list-style-type: none"> Maximize life of disposal area Lower insurance cost
Operational	<ul style="list-style-type: none"> Slurry placement control No re-working of deposit required
Environmental	<ul style="list-style-type: none"> Co-disposal of coarse and fine material Faster trafficable surface

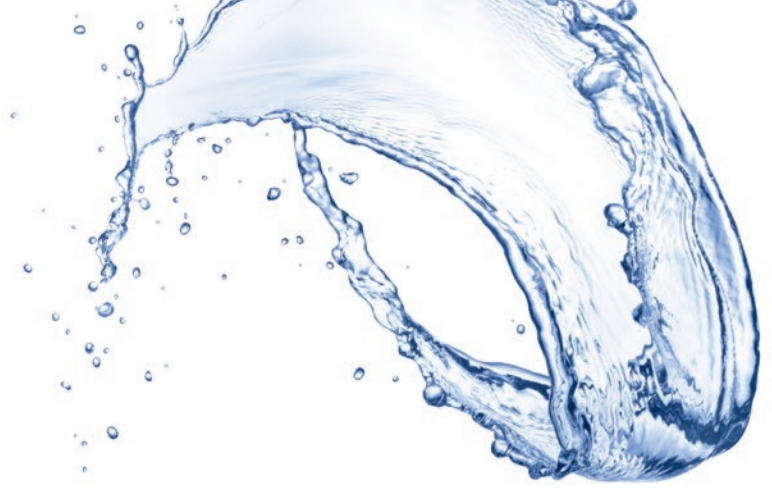
Benefits delivered by improved water release

Economical	<ul style="list-style-type: none"> Reduced evaporative losses
Operational	<ul style="list-style-type: none"> Increased volume for recycling Remove fines contamination
Environmental	<ul style="list-style-type: none"> Reduced fresh water requirement

Benefits delivered by reduced footprint

Economical	<ul style="list-style-type: none"> Lower land management cost Less mobile equipment Lower rehabilitation costs
Environmental	<ul style="list-style-type: none"> Quicker rehabilitation time Lower energy consumption

Customer Engineering Solutions



Engineering equipment

- ✦ High-quality, industry-standard engineering equipment
- ✦ Proven to be durable in both high and low temperature environments, as well as high-humidity tropical locations
- ✦ Proven low maintenance record – essential for remote locations
- ✦ Complies with mining industry electrical safety standards

Engineering specialists service

- ✦ Specify and size engineering requirement
- ✦ Provide customized design modifications for individual applications, as required
- ✦ Supply and commission equipment on site
- ✦ Provide routine service checks and maintenance throughout

Tailings Management products are available in variety of pack sizes, including bulk delivery.

Engineering equipment includes

- ✦ Powder storage unit
- ✦ Batching systems – dissolve powder to a low-concentration solution ready for direct slurry application
- ✦ Control systems – fully integrated automatic control for batching system with manual override
- ✦ Dosing pumps – delivers to the process, with or without further in-line dilution
- ✦ Automated dosing control – fully integrated to minimize and optimize dosing requirement at point of application



Research & Development partnerships

Our collaborative partnerships with leading mineral industry researchers such as AMIRA International and CSIRO keep us at the forefront of industry innovations and allow us to develop sustainable solutions to the industry's issues. Our cooperation with the industry's leading consulting, engineering and mining houses also ensures our programmes are focused on specific solutions and generate value throughout the mining operation.

Technical service, R&D, sustainability, responsible care

Innovation is at the heart of BASF's Mining Solutions business as our aim is to develop novel and innovative chemistries, product applications and processes to effectively meet the evolving challenges that the mining industry continues to face. BASF are committed to working in close collaboration with our customers, academia and global industry organizations.

BASF's extensive backward integration into the building blocks of mineral processing product chemistries enables us to effectively apply our knowledge and chemical experience to develop both conventional and novel chemistries to meet the technical and commercial challenges faced by the industry, both today and into the future.

Our Product Development and Technical Support personnel are located around the globe and are complemented by three BASF Global Competence Centers, based in Tucson (North America), Ludwigshafen (Europe) and Perth (Australia).

With our chemistry, equipment, process and application technologies, industry experience and customer commitment, BASF can uniquely package competencies and expert offerings to effectively support the diversity of mineral processing technology developments and process challenges.



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