

Mining Solutions

RHEOMAX® DR
Copper / Gold Tailings
Case study

 **BASF**

We create chemistry

BASF's Mining Solutions at a glance

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 valuable resources.

We offer our products and technology solutions to the global mineral processing industry along with expert advice and technical support. Our global team is driven by a common goal to provide the best sustainable solution to meet our customers' processing needs. With technical representation in over 100 countries, BASF's technical support is provided on a global, regional and local basis.

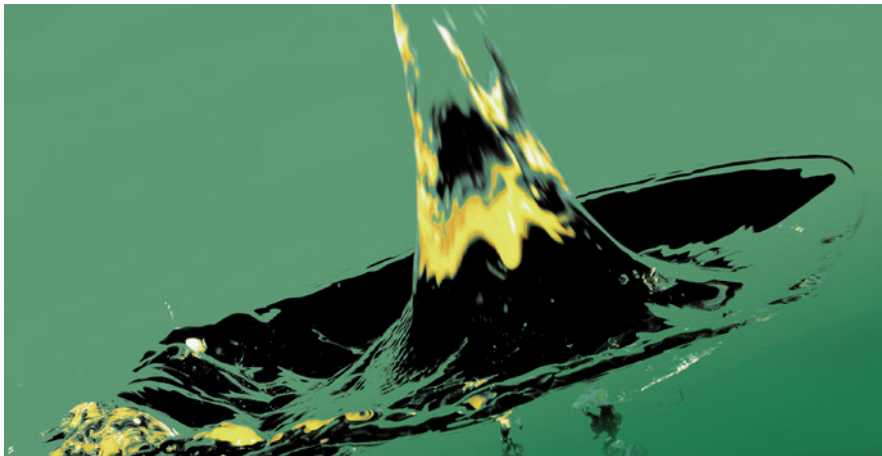
Our chemical and process expertise includes reagents, equipment, process technologies and know-how. All of which are focused on hydrometallurgy, solid liquid separation, tailings management, materials handling, flotation and grinding.



RHEOMAX[®]

Density and Rheology technology

The RHEOMAX[®] DR range delivers higher density and more robust flocculant particles than conventional flocculants, and are effective for many different mineral ore types. This change to aggregate shape means that flocs are more tolerant to solids concentration and shear variations in the feedwell, and the dense particle shape also allows for faster consolidation, high underflow densities and low underflow yield stress.



Process Description

In this case the customer is undertaking solid/liquid separation of the tailings stream using a conventional thickener to recover water. Water at this site is an expensive and limited resource due to the location of the plant in an arid environment. The tailings stream consists of clay/siliceous based minerals and is a by-product of a copper/gold sulphide concentration process.

Issue

The customer needs to produce sufficient clean water from their tailings thickener for recycling back to the process for use in the crushing and grinding circuits. During dry periods extra pressure is placed upon the tailings thickener to produce a higher underflow density and hence more return water. If a higher underflow density can be achieved, then return water is increased, which reduces the need to purchase replenishment water. This provides a significant cost saving for the customer.



Solution

The use of RHEOMAX® 1050 at this site resulted in a 4% increase in water recovery of 14 Gallon/DMT, and an average underflow density increase from 57% wt/wt to 64% wt/wt. In addition the flocculant usage on site was reduced by 34%. During the first stages of RHEOMAX® treatment drought conditions occurred and under such conditions the plant is normally required to reduce

throughput rates due to thickener return water limitations. With the improvements in thickener operation, brought about through the treatment with RHEOMAX® 1050, the plant continued to operate at full capacity resulting in no production losses and significant financial savings.

Results

Fig. 1: Daily solids rate

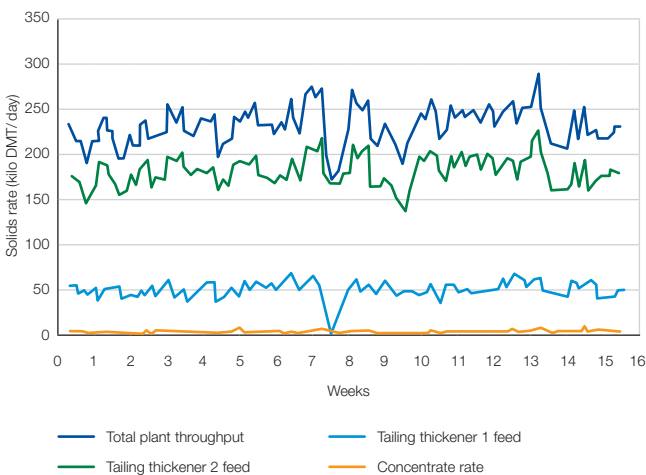


Fig. 2: Tailing thickener 1, water recovery

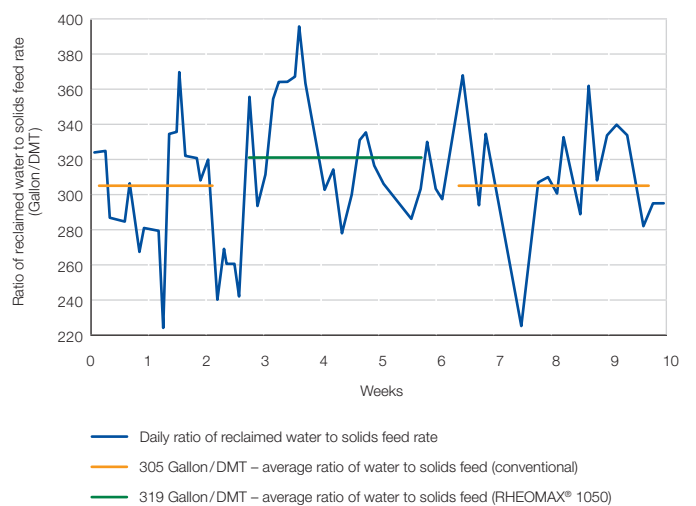


Fig. 3: Tailing thickener 1, flocculant dose (over time)

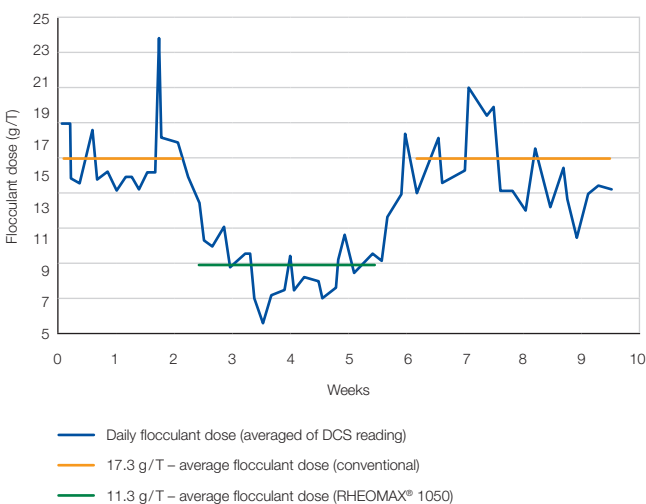
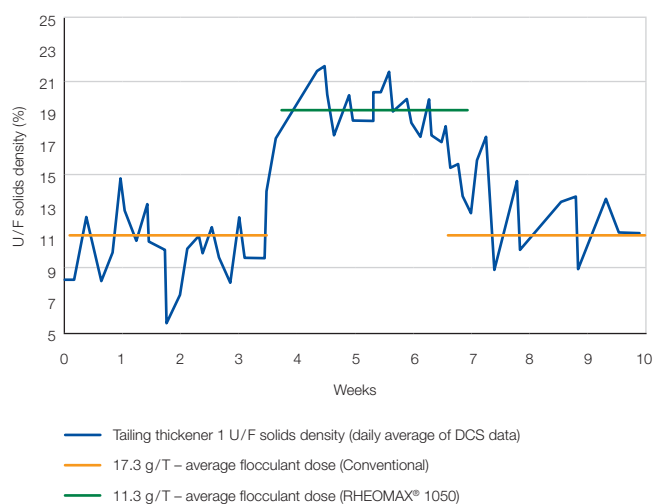


Fig. 4: Tailing thickener 1, underflow solids density



Highlights of RHEOMAX® 9010 performance

- Increase recovery of clean water: 4.6% improvement (14 Gallons DMT)
- Improved underflow solids: 12.5% increase
- Reduced dose rate: 34.7% decrease (major reagent savings)
- Flocculant dose less sensitive to feed solids variation

Technical Service

Full technical service and advice in all aspects of product selection, laboratory tests and plant trials will be provided.

Health & Safety

Detailed information on handling and any precautions to be observed in the use of the product(s) described in this leaflet can be found in our relevant Health and Safety information sheet.

RHEOMAX® benefits

Operational

- Higher underflow density
- Greater plant throughput
- Increased recovery of quality water/leach reagent
- More consistent dose response to fluctuations in feed solids
- Reduced shear degradation due to fluctuations in feed well turbulence
- Improved pumpability of underflow
- Lower reagent consumption

Economical

- Reduced requirement for fresh plant water from external sources
- Lower reagent consumption
- Improved leach efficiency
- More consistent plant performance
- Lower pump energy consumption

Environmental

- Reduced fresh water replenishment
- Reduced water loss to tailings
- Reduced water loss to evaporation
- Lower energy consumption
- Reduced land requirement for tailings disposal

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