

THE USE OF TRISOL 60 AS A DE-WATERING AID

What are De-Watering Aids?

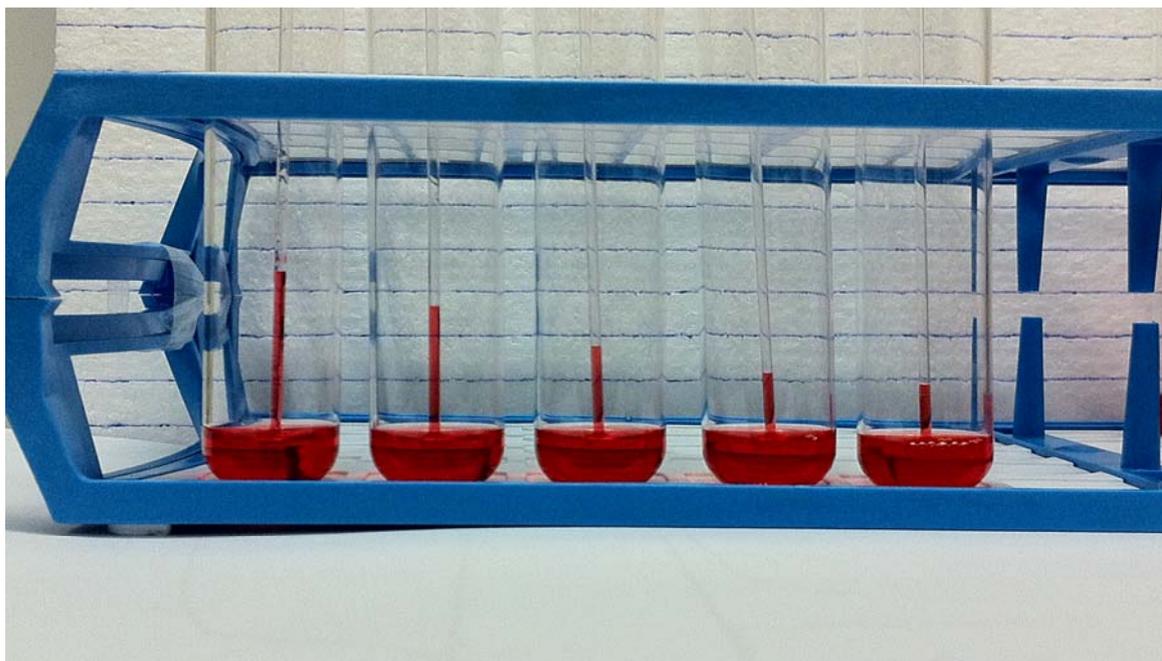
De-watering aids are surface active chemicals used in the mineral processing industry to assist filtration processes. Many mining industry products are refined in a slurry form and the final stage of processing is to separate the ore concentrate from the slurry. This is done by passing the slurry through a filter so that the water is removed and a relatively dry filter cake of ore can be collected off the surface of the filter. A de-watering aid is sometimes added to the slurry prior to filtration to reduce the moisture level of the filter cake.

Trisol 60 is an excellent de-watering aid for mineral ore slurries. The product is a non-dangerous, low viscosity liquid with a low freezing point, making it an easy material to store and handle.

How do De-Watering Aids Work?

The filter cake can be described as a porous solid with an array of pores which contain liquid (predominantly water). An effective means of removing excess water is to reduce the surface tension of the liquid phase, which results in a much lower capillary pressure. The reduction in capillary pressure means the removal of water occurs at lower pressures, and that water trapped in smaller pores is more readily removed. Trisol 60 is a very cost effective means of reducing capillary pressure in aqueous solutions (see **Figure 1**).

Figure 1. Relative Capillary Pressure of Aqueous Trisol 60 Solutions



0

0.005%

0.01%

0.02%

0.05%

Trisol 60 level

When are De-Watering Aids Used?

The effectiveness of a filtration process in the removal of water from a mineral ore slurry depends on factors such as the particle size of the slurry components, the type of ore being processed and the type of filter being used. A small particle size will be more difficult to filter than coarser particles, and higher pressure filters are more likely to achieve lower moisture levels. De-watering aids are not always needed to obtain satisfactory levels of moisture in filtration processes, but they can be very important for several reasons:

- Safe and cost effective transportation of the final filter cake material – this is particularly relevant for metal ore concentrates which are being transported for smelting.
- Reduction in thermal drying costs – particularly relevant in alumina processing.
- Improved filter cake quality by reducing water soluble residues such as caustic soda.
- Reduced blinding of filter cloth.

How are De-Watering Aids Used?

De-watering aid should be added to the mineral ore slurry just prior to the filtration process. If possible the de-watering aid should be allowed 15-30 seconds of residence time in the slurry to disperse completely (in-line mixers can be employed to facilitate the dispersion process). Tri-Tech Chemical can help with the design of dosing equipment and selection of dosing points.

What Results can be Expected?

Results will vary from one operation to another, and also with different process conditions. A typical result for alumina or copper concentrate filtration would be a reduction in final moisture content of around 2%. This would be achieved with dosage rates of 50-300 g of chemical per metric tonne of concentrate. Laboratory tests can be used to estimate the appropriate dosage rates for your process and assess the value in using a de-watering aid.