

- Lowers Dust Extinction Moisture (DEM) Points for Fine Grade Ores
- Releases Adsorbed Moisture from Fines
- Lubricates Fine Particles with Greater Water to Surface Area Contact
- Modifies Fine Ores to Behave in Friable Manner for Improved Materials Handling, in under DEM and over DEM Materials.
- Highly Concentrated
- Aids Stabilizing Ore Moisture Contents
- Environmentally Benign

History

PDX is the result of over twenty-five years of research into “non-standard” ore and soil stabilizing agents. It was developed by combining proven surfactant wetting agent formulations with novel biological-based (rather than chemical) active ingredients.

Description

A highly concentrated liquid biochemical used for ore DEM modification that is entirely biodegradable and non-toxic. PDX is an effective aid to wettability and friability thus lowering ultra fine ores DEM and improving material handling of ore movements. When added into the mining ore stream significant improvements are achieved. These are reflected in the following areas:

- Significant Dust Reduction.
- Improved friability, workability and materials handling properties of fine ores.
- Lowers water levels required for achieving DEM.
- Minimal environmental and processing impact in contrast to petroleum-based water extenders.

Injection Points

PDX is most effective when added to an ore body early in the materials handling process. Immediate Chemical changes to the water and electrochemical modification to fine ore particles are apparent.

Mechanical mixing through the material handling process will create uniform moisture content within the ore. PDX generates long term ore modification that remains entrenched throughout the process minimizing the additional water injection in the process stream.

PDX will cause permanent physical and chemical changes in ore without affecting downstream processing. PDX is a non-toxic biodegradable liquid concentrate that mixes easily in water for application with standard water spraying equipment.

Suggested Injection Points

- Alongside deluge water sprays at bin loading area.
- Under Grizzly at primary crusher, and secondary crusher.

Application

Laboratory Ore Testing

The variability of ore types makes it difficult to predict the base data without initial ore testing conducted by Rainstorm. Samples of 20kg are required to formulate dose rates and DEM changes.

Particle Size Analysis

DEX is only effective on the fines component of the ore. Application rates can be fine-tuned to suit fines and lump ratios.

Atterberg Limits

The Atterberg Limits Test determines the consistency of a clay ore, which can range from a viscous liquid to a hard solid, depending on water content. The parameters that are measured, namely the Liquid Limit, Plastic Limit and Shrinkage Limit, together are indicative of the behaviour of an ore as it becomes wet. The Plasticity Index (PI) of an ore can be interpolated from these tests to provide an indication of the clay content of an ore.

PDX: Application Rates & Procedures

An application rate of one litre of PDX for 15 to 25 tonnes of ore fines is recommended, depending on site conditions.

1. PDX is easily applied with a water truck and standard spraying equipment.
2. Bulk product tanks and injection pump power packs with high pressure spray nozzles, can be provided by Rainstorm.
3. Bulk supply is available to minesites throughout Australia with extensive distribution network in West Australian Pilbara region currently in place.

General Application Tips

Dilution of the PDX required for the project is not a critical factor in the performance of the product. The volume of PDX required to treat a given volume of ore, once determined, can be added in a convenient volume of water. It is only the ratio of PDX volume to ore volume which needs to be considered.

How It Works

PDX consists of three components which alter the physical and chemical characteristics of a ore to enhance wetting to surface area of the ore particles.

1. Surfactants

Penetration: Surfactants in PDX decrease the surface tension of water and promote the uniform transmission of moisture throughout the ore. Water adhered to fine particles is released. This can result in a significant reduction in the volume of water required for the DEM.

Friability: The wetting action of the surfactants lubricates and separates clay colloids and ore particles. The surfactants in PDX promote complete coverage of particle surfaces with a microscopic film of water. This results in significantly improved ore wettability, friability and materials handling.

2. Trace Elements

An ionic bond is formed as a result of the attraction between oppositely-charged ions. Ionic exchange refers to the capacity of ions to exchange with other ions which have a smaller net charge. The trace elements in PDX participate in ionic exchange reactions with fine particles in the ore. Additionally, much of the adsorbed water at the interface of the clay particles is altered to improve moisture to surface area wetting ability for the long term.

3. Organics

Organic compounds in PDX serve primarily to modify excess ion exchange points in the ore lattice and alter the behaviour of the adsorbed water.

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