Cement Grinding Aid for enhancement of cement early strength and reduction of unit grinding energy

Description

NIROGRIND AD500 is a liquid, ready-to-use cement grinding aid designed to enhance the early strength of cement and to improve the efficiency of the grinding process by reducing the surface energy forces.

It also improves the flow characteristics of cement with positive impact on cement conveyance and reduction of pack-set in storage.

NIROGRIND AD500 is effective in both open circuit and closed-circuit cement mills.

It is compatible with all types of cement and complies with ASTM C465-99 as a nonharmful processing additive.

Uses

- ✓ Ordinary Portland cement
- ✓ Blended cement with limestone, fly ash or slag.

The special characteristics of NIROGRIND AD500 effectively activate the hydration process between cement particles and the non-reactive or reactive fillers.

For additional information on NIROGRIND AD500 and its use in developing special performance characteristics, contact your local Nirman Chemicals Limited sales field representative.

Advantages

- ✓ Mineral additive rates can be increased.
- ✓ Increase of early (24 and 48 hours) mechanical strengths of cements.
- ✓ Increases mill production (8% to 15%) depending on the efficiency of the equipment and the characteristics of the material to be ground.
- ✓ Reduces grinding energy costs.
- ✓ Improves physical properties of the ground material.
- ✓ Improves performance in both closed and open circuit systems at equal specific surface area or equal sieve residues.
- ✓ Powder flow characteristics are improved before, during and after storage.
- ✓ Pack set tendencies and coating are substantially reduced.

- ✓ The risk of false set is reduced due to lower grinding temperature.
- ✓ Cement particle size distribution is improved resulting in more thorough hydration.
- ✓ Reduces plastic shrinkage (Initial set).

Working Mechanisms

NIROGRIND AD500 accelerates the formation of Ettringite by accelerating the hydration process of C_3A and A_4AF as well as its transformation into monosulphoaluminate to improve cement early strength.

Another function of NIROGRIND AD500 is to partially neutralise the charges present on the surface of cement particles, which are developed during milling, hence reduce the surface free energy of the material being ground. The additive molecules get adsorbed on the surface of the cement particles by weak electrostatic force, favouring the repulsion and/or steric hindrance between particles, which not allow the agglomeration of cement particles and as a results grinding efficiency improves. Similarly, the 'coating' effect is partially or totally avoided, enhancing other issues such as handling and storage conditions (boosting the 'pack set') or the separator efficiency, also improve the life of grinding media.

Characteristics

Form	: Liquid
Colour	: Brownish
Relative Density	: 1.18 ± 0.02 at 25°C
pH	: >6
Alkali content	: < 10% Na_2O equivalent

Dosage

Optimum dosage of NIROGRIND AD500 should be determined by site trials only.

However, as a guide, typical dosage rates will vary from 0.02% - 0.06% by weight of cement for Types I & II cements and 0.03% - 0.07% by weight of cement for Type III cements.

Higher dosage might be needed for higher percentage of clinker replacement or less reactive cement

Direction for use

NIROGRIND AD500 can be added at the clinker feed conveyer belt or directly into the cement mill's first compartment. A proper dosing pump is required to ensure the correct dosage into the cement for obtaining the optimum performance. Our technical supports are available to provide assistance in the use of NIROGRIND AD500 with the manual, automatic or computerized dispensing system.

Technical support

NIRMAN CHEMICALS provides technical advisory services for on-site assistance and guidance on mix design, optimum dosage evaluation of trials.

Packaging

NIROGRIND AD500 is supplied in 250 kg drums, 1100 kg IBC or in bulk on request.

Storage and Shelf life

NIROGRIND AD500 must be stored where temperatures do not drop below +5°C. If product has frozen, thaw at +5°C or above and completely reconstitute using mild mechanical agitation. Do not use pressurized air for agitation. Store under cover, out of direct sunlight and protect from extremes of temperature.

Shelf life is 12 months when stored as above.

Failure to comply with the recommended storage conditions may result in premature deterioration of the product or packaging.

For specific storage advice consult our local NIRMAN CHEMICALS representative.

Safety precautions

NIROGRIND AD500 does not fall into the hazard classifications. However, it should not be swallowed or allowed to come into contact with the skin and eyes.

Suitable protective gloves and goggles should be worn. Splashes on the skin should be removed with water. In case of contact with the eyes it shall be rinsed immediately with plenty of water and medical advice sought immediately. If swallowed, medical attention shall be sought immediately - Vomiting should not be induced.

Fire

NIROGRIND AD500 is water based and non-flammable.

Cleaning of Tools

Clean all tools and application equipment with water immediately

Note

All Technical Data Sheets are updated on regular basis; it is the user's responsibility, to obtain the most recent issue.

Field services where provided, does not constitute supervisory responsibility, for additional information contact our local NIRMAN CHEMICALS representative.

Disclaimer

Whilst any information contained herein is true, accurate and represents our best knowledge and experience, no warranty is given or implied with any recommendations made by us, our representatives or distributors, as the conditions of use and the competence of any labor involved in the application are beyond our control.

NIRMAN CHEMICALS

AN *ISO* CERTIFIED COMPANY

ISO 9001:2015 — Quality Assurance Certification
ISO 14001:2015 — Environmental Management Certification
ISO 45001:2018 — Health & Safety Certification

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