Stellar Unity
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Technical Information Sheet

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Protein Gypsum Retarder

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Product Category	• Protein, plant-derived, Gypsum Retarder • Gypsum Setting Time Slower • Various Grades of Products to Suit either Economic Demand or Premium Performance
Application	• Gypsum boards • Veneer Plasters • Plaster Blacks • Gypsum Joint Compound
Key Function(s)	• Give longer open time • Optimize working time of gypsum plaster • Help improve dispersion of gypsum in water

Protein gypsum retarders are a type of chemical admixture used in the concrete industry to delay the setting time of gypsum-based products, such as plaster, gypsum wallboard, and other gypsum-based building materials. These retarders are derived from protein-based compounds, often extracted from natural sources such as animal or plant proteins.

The primary function of a protein gypsum retarder is to slow down the hydration process of gypsum (calcium sulfate) in the concrete or plaster mix, which allows for extended workability and adjusted setting times. This is especially useful in applications where extended time for mixing, shaping, or application is necessary.

Mechanism of Action

Protein gypsum retarders work by interacting with the calcium sulfate in gypsum, delaying the onset of crystallization. When gypsum is mixed with water, it undergoes a hydration reaction where calcium sulfate reacts to form a crystalline structure, leading to the hardening of the material. The protein-based retarders modify the nucleation sites for the gypsum crystals, slowing down the growth of these crystals and thus delaying the setting time.

The retardation effect can be controlled by adjusting the dosage of the protein retarder, allowing for flexibility depending on the specific needs of the project, such as:

- Time-sensitive casting of gypsum products.
- Workability requirements during finishing.
- Environmental conditions like temperature, where the setting process may need to be delayed to prevent premature hardening.

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Characteristics of Protein Gypsum Retarders

1. **Natural Source:** Protein retarders are typically derived from animal or plant proteins, such as casein (from milk) or soy proteins.
2. **Set Time Control:** They provide better control over the setting time of gypsum-based materials, especially in hot weather, when gypsum tends to set more quickly.
3. **Low Dosage:** Only small amounts of protein retarders are needed to effectively delay setting time, often ranging from 0.05% to 0.5% by weight of the gypsum.
4. **Compatibility:** Protein retarders are typically compatible with other gypsum additives, but care should be taken to ensure they do not interact negatively with other admixtures or materials used in the mix.

Applications

Protein gypsum retarders are used in a variety of applications, including:

- **Plastering:** In plaster-based applications, protein retarders are used to extend the workability time, giving workers more time to apply and finish the plaster before it hardens.
- **Gypsum Wallboard and Plasterboard Production:** These retarders help control the setting of gypsum plaster in the manufacturing of drywall and other plasterboard products, ensuring that the material remains workable during the production process.
- **Precast Gypsum Products:** In the production of precast gypsum products like molds, castings, and decorative elements, protein-based retarders help in achieving a longer workability time, allowing for better molding and finishing.
- **Construction in Hot Climates:** In hot weather, gypsum may set too quickly. Protein retarders help in maintaining an appropriate setting time, ensuring that gypsum products can be applied without issues.

Benefits

- **Extended Workability:** Provides more time for manipulation, finishing, or molding of gypsum products before they set.
- **Enhanced Control:** Offers better control over the setting time, especially in varying environmental conditions.
- **Improved Finish:** Slower setting times may result in smoother finishes and better surface quality in plaster or gypsum wallboard.
- **Cost-Effective:** Protein retarders are typically a cost-effective solution for adjusting setting times without needing to change the mix or use expensive chemical retarders.

Limitations

- **Overdosage:** Excessive use of protein gypsum retarders can delay setting time too much, which may lead to longer drying times and potentially affect the final strength and performance of the product.
- **Sensitivity to Temperature:** The effectiveness of protein retarders can vary depending on the temperature and humidity conditions. In high temperatures, retarders might be less effective or require higher doses.
- **Source Variability:** The quality and consistency of protein retarders can vary depending on their natural source, so manufacturers must ensure a reliable supply and consistency for uniform results.

Conclusion

Protein gypsum retarders are an important tool in the gypsum and plaster industry, allowing manufacturers and contractors to control the setting time of gypsum-based materials. By slowing down the hydration process, they provide extended workability, which is essential for tasks like plastering, molding, or finishing in construction. However, careful control of dosage is necessary to avoid over-retardation and ensure that the final product has the desired strength and performance.

Stellar Unity is ready to serve you with samples for lab evaluation. Our product and manufacturer from China has registered for European standard REACH, ISO 9001, ISO 14001. Our protein, plant-derived, retarder products are many to suit either your economic demand for cost saving projects or premium performance of aesthetic appearance target.

For more information of product

Website : www.s-unity.com