



Polycarboxylate Superplasticizer

Revision version : 001

Date of revision : 19-Dec-2024

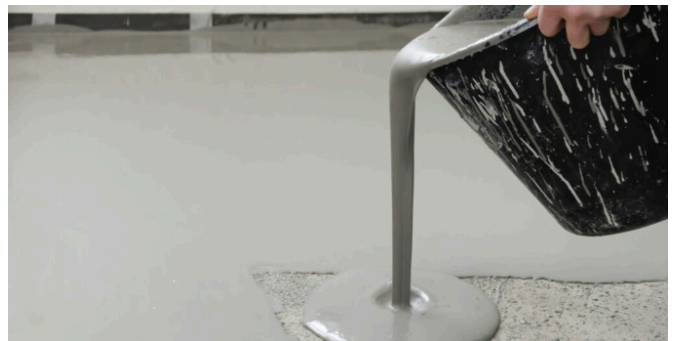
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Product Category	<ul style="list-style-type: none"> ● WRA (Water Reducing Agent) for Concrete ● Concrete Admixture ● Superplasticizer for Concrete
Application	<ul style="list-style-type: none"> ● Self-compacting concrete ● Self-leveling concrete ● Precast concrete ● High-strength concrete
Key Function(s)e	<ul style="list-style-type: none"> ● Improve density and physical strength of concrete mixture ● Maximize workability of concrete mixture ● Maximize curing behavior of concrete mixture ● Fast casting process for concrete molding

In the superplasticizer technology, polycarboxylate superplasticizer (PCE) is the latest and advanced chemistry for water-reducing purposes in cement admixture. It is a type of high-performance chemical additive commonly used in concrete to improve its workability, reduce water content, and enhance its overall strength. If Lignosulfonate technology could be able to reduce 10-15%, Melamine based could reduce 20-25%, Polycarboxylate-based could achieve 30% water-to-cement ratio. It is a subclass of superplasticizers, which are water-reducing agents used to increase the fluidity of fresh concrete without compromising its strength.

Key Features of Polycarboxylate Superplasticizer:

1. **Structure and Composition:** Polycarboxylate superplasticizers are typically based on a polymer backbone, often with carboxylate groups ($-\text{COOH}$) and sometimes ethylene oxide groups ($-\text{CH}_2-\text{CH}_2-\text{O}-$) attached. These molecules act as dispersants by providing electrostatic and steric repulsion between the cement particles in the mixture.
2. **Functionality:**
 - **Water Reduction:** PCEs can significantly reduce the amount of water required in concrete, which enhances its compressive strength and durability.
 - **Improved Workability:** By reducing the water-to-cement ratio, PCE improves the flowability and workability of the concrete without adding excess water. This makes it easier to mix, transport, and place.
 - **Extended Open Time:** PCE helps to maintain the fluidity of concrete for a longer period, which is beneficial in large-scale or delayed applications. It has extended open time for technicians to manage the surfacing.



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3. **Advantages:**

- **Higher Water Reduction:** PCEs can reduce water content by 25–40% more than conventional plasticizers.
- **Enhanced Durability:** By reducing the water content, Polycarboxylate superplasticizers can increase the density and reduce porosity in hardened concrete, leading to better durability.
- **Improved Early Strength:** Since less water is used in the mixture, the resulting concrete tends to have a higher early-age strength.
- **Compatibility with Different Mix Designs:** PCE is suitable for use in high-performance concrete, self-compacting concrete, and high-strength concrete applications.

4. **Applications:** Polycarboxylate superplasticizers are used in:

- High-performance concrete (HPC)
- Self-compacting concrete (SCC)
- Ready-mix concrete
- Precast concrete
- Self-leveling concrete
- Concrete for structures requiring high strength and durability

5. **Environmental Benefits:** Since PCE can reduce the amount of water needed for mixing, it can contribute to reducing the overall carbon footprint of concrete production by allowing the use of lower water-to-cement ratios, which often leads to a reduction in the need for cement.



Overall, Polycarboxylate superplasticizers are highly valued in the construction industry due to their superior ability to enhance concrete properties, making them ideal for use in modern and demanding construction projects.

At Stellar Unity, it has collaborated with an exceptional manufacturer from China who has dedicated their RD and technical support team to broaden formulation vectors to suit future demand of end-applications. Customers could provide the ideas or specifications that they would like to approach and introduce the finished products to end-applications. Our RD and technical support team is willing to make customers' dreams come so true.

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