

# POLARSET®

Non-corrosive, non-chloride set-accelerating admixture ASTM C494 Type C

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## Product Description

PolarSet® is a non-corrosive, non-chloride admixture for concrete. It accelerates cement hydration resulting in shortened setting times and increased early compressive strengths. PolarSet does not contain calcium chloride and is completely non-corrosive to reinforcing steel, metal decks and all metal components of your admixture storage and dispensing system. It is formulated to comply with ASTM C494 Type C and can be used at any dosage to comply with ACI 318 guidelines for chloride content of concrete. One gallon of PolarSet weighs approximately 11.25 lbs (1.35 kg/L).

## Uses

PolarSet is specially formulated to reduce concrete setting times and increase early strengths for concrete in very cold conditions and may be used to reduce the time that concrete must be protected against freezing in ambient temperatures as low as 20°F (-7°C). For conditions not subject to freezing, PolarSet may be used to speed finishing operations and/or form removal, leading to savings in concrete construction costs.

## Special Feature

PolarSet provides set time acceleration and early strength development similar to that provided by calcium chloride, but without the potential corrosive effects. PolarSet can, therefore, be used where potential corrosion of embedded or stressed steel must be avoided. It can also be used in concrete that is to be placed on steel clad or zinc coated steel decks where corrosion must be similarly avoided.

## Performance

In concrete mixes, PolarSet accelerates the chemical reaction between Portland cement and water. It speeds up the formation of gel—the binder that bonds concrete aggregates together. Accelerated gel formation in turn shortens the setting time of concrete, compensates for the set-slowing effects of cold weather and contributes to the development of higher strengths. Gel formation promotes heat generation within the mix—helping to protect the concrete from freezing during the critical first hours after placement.

## Compatibility with Other Admixtures and Batch Sequencing

PolarSet is compatible with most GCP admixtures as long as they are added separately to the concrete mix, usually through the water holding tank discharge line. In general, it is recommended that PolarSet be added to the concrete mix near the end of the batch sequence for optimum performance. Different sequencing may be used if local testing shows better performance. Please see GCP Technical Bulletin TB-0110, *Admixture Dispenser Discharge Line Location and Sequencing for Concrete Batching Operations* for further recommendations. PolarSet should not come into contact with any other admixture before or during the batching process, even if diluted in mix water.

Pretesting of the concrete mix should be performed before use, as conditions and materials change in order to assure compatibility, and to optimize dosage rates, addition times in the batch sequencing and concrete performance. For concrete that requires air entrainment, the use of an ASTM C260 air-entraining agent (such as Daravair® or Darex® product lines) is recommended to provide suitable air void parameters for freeze-thaw resistance. Please consult your GCP Applied Technologies representative for guidance.

## Mix Adjustment

Since PolarSet may be used at high dosages, the concrete producer should account for the water contained in the PolarSet. Each gallon of PolarSet added to a concrete mix will contribute 6.5 lbs (0.78 kg/L) of water to that mix.

## Packaging & Handling

PolarSet is currently available in bulk quantities by GCP metered systems, or in totes and drums.

PolarSet freezes at approximately -10°F (-23°C), but its set acceleration, strength gain and non-corrosive properties are completely restored by thawing and thorough agitation.

## Product Advantages

- Designed for cold weather concreting at temperatures as low as 20°F (-7°C)
- Completely non-corrosive
- Reduces set time and increases early strengths
- Can be used at high dosages

## Addition Rates

The amount of PolarSet used will depend on specific job conditions, on local materials and on the degree of set acceleration and early strength development required. Typical addition levels range from 8 to 60 fl oz/100 lbs (520 to 3910 mL/100 kg) of cement, but levels as high as 100 fl oz/100 lbs (6520 mL/100 kg) of cement can be used. For freeze protection purposes typical addition rates are between 60 to 80 fl oz/100 lbs (3910 to 5220 mL/100 kg) of cement.

## Dispensing Equipment

A complete line of accurate dispensers is available. PolarSet may be introduced on the sand, in the water, or at the end of the batch cycles. Similar to all concrete admixtures, PolarSet should not come in contact with other admixtures prior to entering the concrete.

## Specifications

The set-accelerating admixture shall be PolarSet, non-corrosive, non-chloride set accelerator, as manufactured by GCP Applied Technologies. The admixture shall be used in strict accordance with the manufacturers' recommendations. The admixture shall comply with ASTM Designation C494 Type C and will not contain purposely added chlorides or contribute to steel corrosion. Certification of compliance will be made available upon request.

Concrete shall be proportioned in accordance with *Recommended Practice for Selecting Proportions for Normal Weight Concrete*, ACI 211.1 or *Recommended Practice for Selecting Proportions for Structural Lightweight Concrete*, ACI 211.2, or in accordance with ACI 318.

For use in freeze protection, request sample specification available from your GCP Engineering Services representative.

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