

# HAHN

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## READY MIX

### Accelerators & Retarders

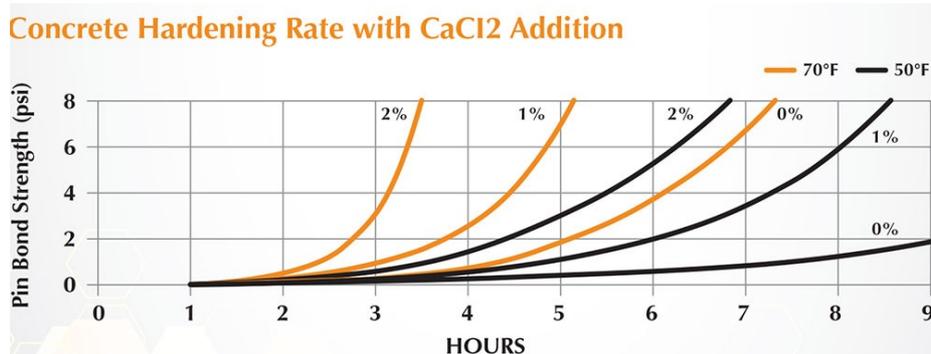
Technical Bulletin #11 - November 2022



In [Technical Bulletin #2](#), we discussed the effect on temperature and concrete set times. As you might recall, the general rule of thumb is for every 20° movement in concrete temperature, concrete set times either double or halve (depending on the direction of the change in temperature). However, this is not a phenomenon that we are hopeless to address. Enter Accelerators and Retarders, our tools for manipulating the set times and early strength gain characteristics of concrete.

#### Accelerators

In cold conditions, or when extreme early strength is needed, an accelerator can be an integral part of a concrete mix. Accelerators reduce the setting time of fresh concrete and increase the initial strength gain of hardened concrete.



The decreased set times can help save labor costs in cooler conditions.

The early strength increase is important in freezing conditions or when a contractor is trying to achieve an early-open strength. They also can be useful for turning around forms quicker on walls or allowing post-tensioning cables to be stressed earlier.

Accelerators have some downsides, however. They are not an anti-freeze agent and do not alleviate the need for protective measures in cold weather. While accelerators allow for early strength development, they sacrifice some long-term strength versus the same mix without an accelerator. Care must be taken that the contractor is prepared for the decreased setting time, as the concrete can easily get hot in a hurry. Accelerators can lead to crazing cracking and other superficial blemishes or color changes. Finally, the most effective and economical accelerator, Calcium Chloride, is corrosive to steel and other metals and should never be used with rebar or wire mesh.

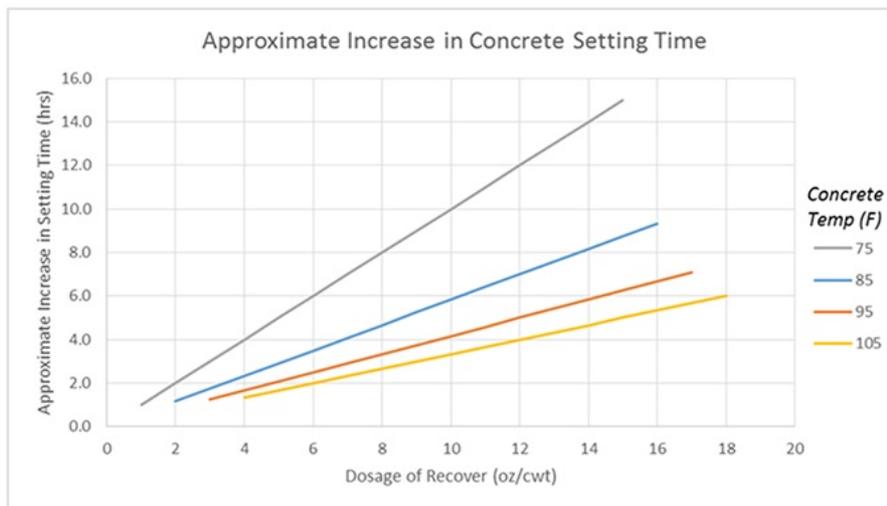
Non-Chloride Accelerators such as Daraset 442 have been formulated to be safe for use with steel and are quickly becoming the standard use accelerators. Unfortunately, they are significantly more expensive and only about 50-60% as effective.

Accelerators are typically dosed as a percentage of cement weight, with .5%-2% being the normal range.

## **Retarders/Hydration Stabilizers**

In the summer months, we may want to control the set time in an opposite direction to give our contractors more time to finish the concrete. For this we can use retarders, or a newer generation of admixtures, known as hydration stabilizers. The main difference between retarders and hydration stabilizers are hydration stabilizers act like calling a "timeout" on your concrete's set for a period of time determined by dosage and then resuming set after the admixture wears off at the normal setting pace. Traditional retarders often have a "catch-up" period where the concrete sets very quickly once they have worn off. At Hahn Ready Mix, we typically only offer Recover from GCP, which is a hydration stabilizer.

Hydration stabilizers can be used to adjust the setting time almost to any degree. In some areas of the country, hydration stabilizers are used at very high doses to put the concrete to "sleep" for eight hour drives, and then are revitalized with accelerators on site. Hydration Stabilizers also are effective at holding slump for the life of the admixture, resulting in less need for repeated water additions on site.



RECOVER® admixture in everyday concrete

Recover is dosed by oz per 100lbs of cementitious materials. A normal dosage rate would be 3oz/hwt, but the chart above shows how extended set times can be achieved at extreme temperatures and high dosage rates.

Hydration stabilizers or retarders should not be used in cold weather conditions or on extremely windy days, as the slower set time can leave the surface vulnerable to drying out and resulting in plastic shrinkage cracks.

The ultimate retarder is actually sugar, but this should only be used in emergency situations, as a pound of sugar will prevent a whole truck of concrete from EVER setting up. Our mechanics keep sugar on hand for use in the event of a truck breakdown so they can save the mixer drum. Sugar is such a powerful retarder that a single mountain dew can ruin a load of concrete. Care should always be taken drinking soda near a concrete pour.

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### Hahn Ready Mix

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