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Rapid-1 Hardening Accelerator Concrete Admixture

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RAPID-1 HARDENING ACCELERATOR CONCRETE ADMIXTURE

THE NEED

The New Jersey Department of Transportation needed a special concrete to be used in highway reparations that could be poured and reopened to traffic in less than 6 hours. They found that full depth, full lane highway repairs could be reopened without altering the concrete's materials, production, placement, or finishing operations. Additionally, precast and prestressed producers were looking for a special concrete that could shorten curing times and lower overall production costs.

FIGURE 1 SIKA RAPID-1 CONCRETE ADMIXTURE

THE TECHNOLOGY

SIKA Rapid-1 is a concrete admixture that allows the development of very early high strengths in concrete consisting of commonly used mix components. Unlike concrete set accelerators, it does not reduce set time or long-term strength, and it does not corrode steel reinforcing. This hardening accelerator allows placement of fresh concrete without early stiffening, followed by a period of very rapid strength gain after initial set.

Sika Rapid-1 is non-chloride (non-corrosive) and will not limit the long term strength gain of concrete that is often sacrificed when using set accelerators. The advantages and benefits amount to a placeable concrete for improved production with less manpower

and very early high strengths achieved without performance tradeoffs. In addition to the benefits for ready mixed concrete, the hardening accelerator offers advantages to precast/prestressed concrete producers. Sika Rapid-1's interaction with the cement hardening process occurs during the hydration phase after initial set, and results in additional internal heat generation. This heat is used to reduce or eliminate the cost of steam curing, and/or shorten curing times. Highway contractors can place full-depth concrete that is ready for traffic or paving operations in under six hours.

THE BENEFITS

- Allows an initial strength increment during the first 12 hours of 100% compared to a test concrete.
- Outperforms 50% to 100% the performance of regular chloride based concrete accelerators.
- The faster reopening of the highway repairs reduces signaling costs.
- The product can be use in combination with a superplasticizer without modifying its properties.
- Provides a reduction in heat and thermic insulation costs.
- Allows a faster utilization of concrete forms. It allows an increase in production of precast elements due to its higher initial strength.

STATUS

This technology won the 1997 NOVA Award from the Construction Innovation Forum.

The product complies with the following specifications: EN934-2 (Swiss), ASTM C-494 Type C (U.S.A.) and AASHTO M-194 Type C (U.S.A.)

POINTS OF CONTACT

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REVIEWERS

Peer reviewed as an emerging construction technology

DISCLAIMER

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