

Rapid Concrete Repair

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Sika Corporation

▲ **Hardening Accelerators**

- ◆ Single component liquid admixture
- ◆ very high early strength development
- ◆ does not affect plastic properties
- ◆ maintains workability for ease of placement
- ◆ no early set or stiffening of concrete even at high dosages
- ◆ Plant added admixture

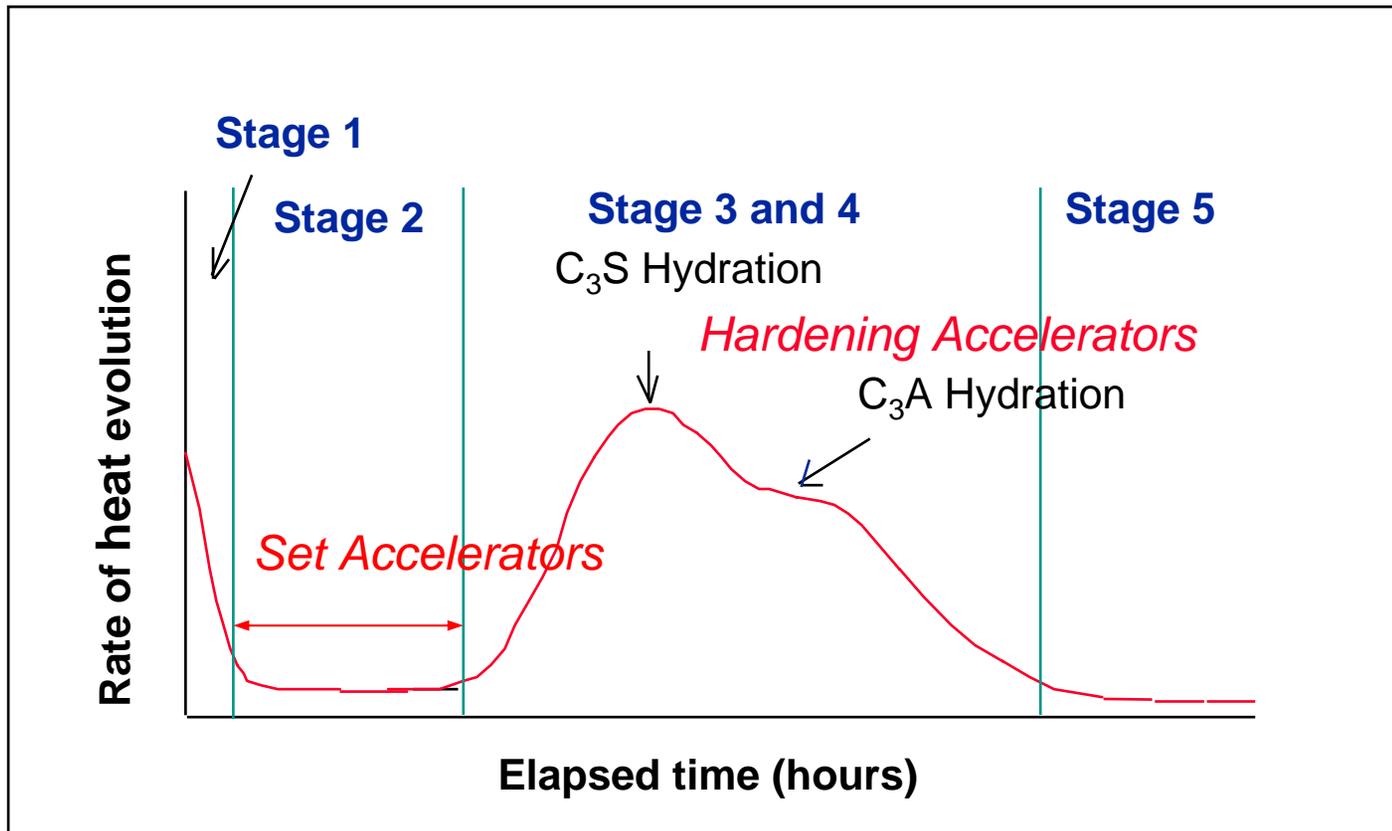
Hardening vs. Set Accelerators

◆ EN: Standard Specifications for Admixtures

	Set Accelerator	Hardening Acc	
Time of Setting: <i>Allowable deviation from control:</i>	68°F 41°F		
Initial setting: <i>at least</i>	30 min 40% (earlier)		
Compressive Strength: <i>min % of control:</i>		68°F	41°F
1 day		120%	130%*
7 days			
28 days	80%	90%	
90 days	> than ref mix at 28 days		

* % of reference mix at 48 hours

Hardening vs. Set Accelerators



Areas of Application

▲ SHRP-C-205

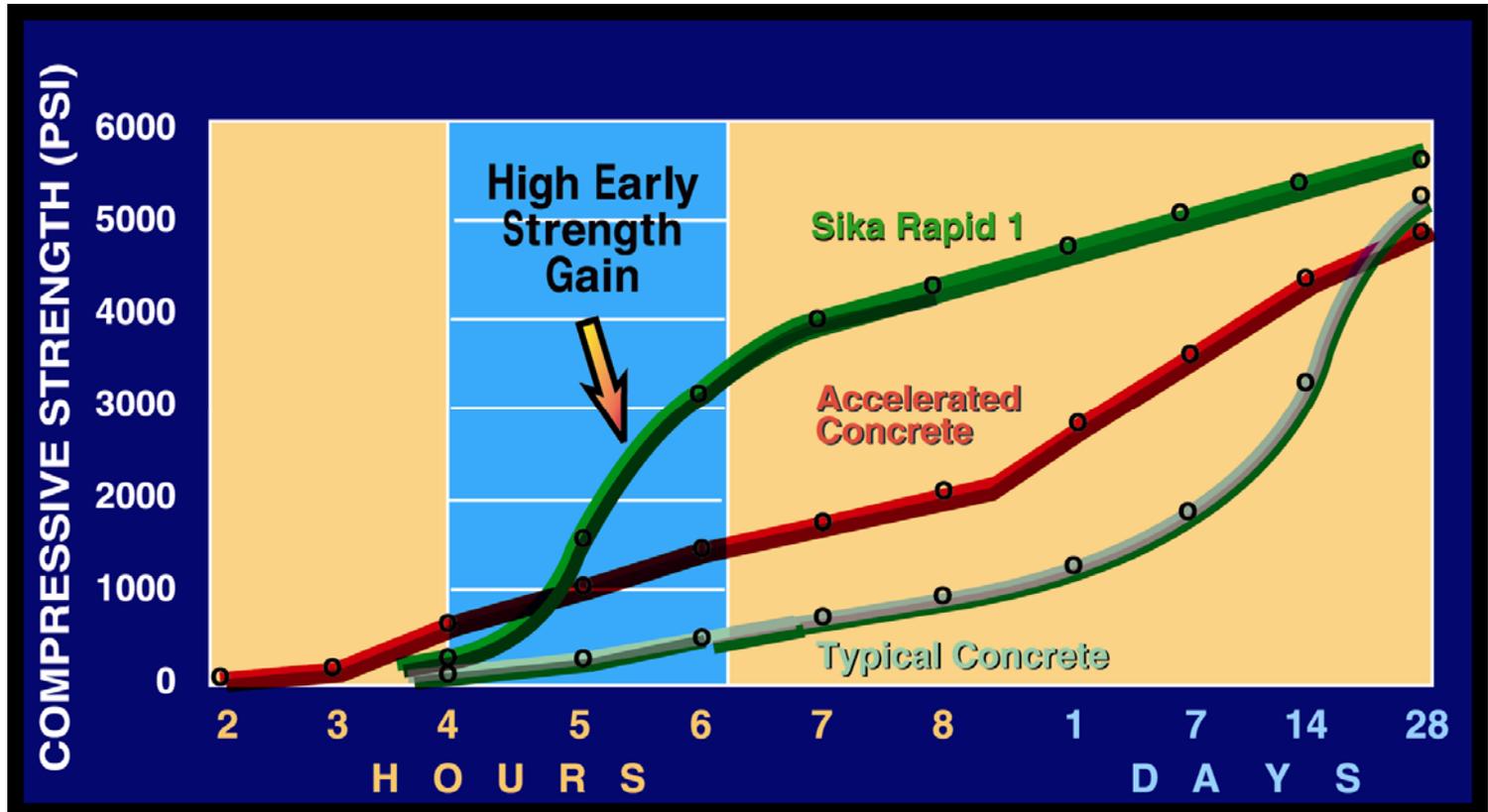
- HPC Concrete for pavement applications shall have one of the following characteristics:
 - 4 hour compressive strength >2,500 psi (VES)
 - 24 hour compressive strength >5,000 psi (HES)
 - 28 day compressive strength >10,000 psi (VHS)
- Have a durability factor greater than 80% after 300 cycles of freezing and thawing
- W/C Ratio <0.35

Areas of Application

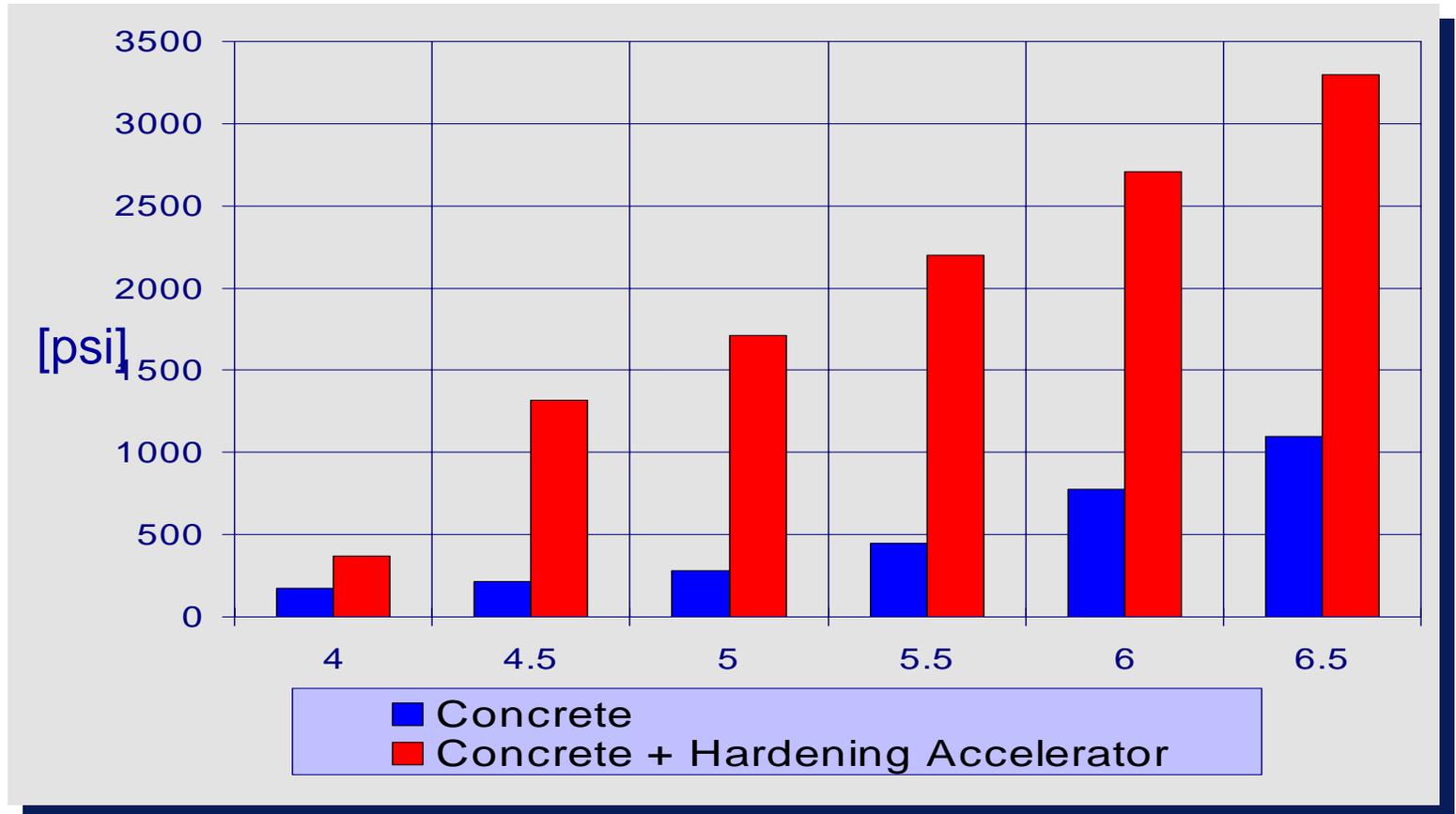
- ▲ Fast track projects
- ▲ Tight schedule
- ▲ Climbing Forms
- ▲ Post tensioned decks/slabs
- ▲ Replace set accelerators
- ▲ Replacement for Type III Cement



High Early Strength Gain



Hardening Accelerators



**Results obtained from Independent Testing Laboratories
and NJDOT Materials Division**

How to use:

- Must use a Superplasticizer
- Addition Rates:
12 - 36 fl.oz. /100 lbs. cementitious
- Batching: May be added during regular batching cycle or at the job site.
- Compatible with Type I, II, III & White Cements
- Compatible with Slag Cements and Flyash
- Compatible with other Admixtures
 - Retarding Admixtures in Summer
 - Accelerating Admixtures in Winter



Case Studies

I-295 PAVEMENT REPAIR



SURE CURE MOLDS



SURE CURE COMPUTER SYSTEM



PROPER CURING OF PATCH



SIKA DIAGNOSTIC VAN

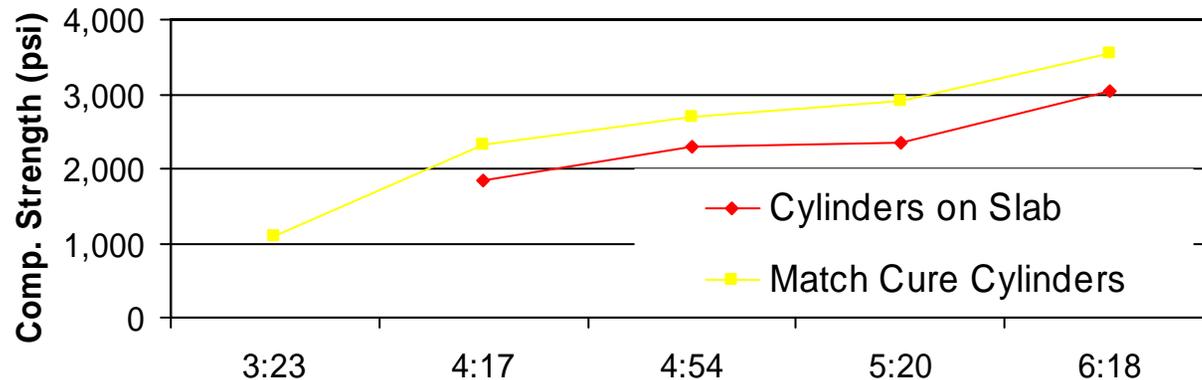


COMPRESSION MACHINE IN VAN



VDOT 6 hour 2,000 psi patch mix

Time from Batching	Time from Placing	Strength psi (cylinders on Slab)	Strength psi (match cure cylinders)
4 h 23 min	3 h 23 min		1,091 psi
5 h 17 min	4 h 17 min		2,312 psi
5 h 19 min	4 h 19 min	1,846 psi	
5 h 54 min	4 h 54 min	2,288 psi	
5 h 57 min	4 h 57 min		2,705 psi
6 h 20 min	5 h 20 min	2,341 psi	
6 h 21 min	5 h 21 min		2,904 psi
7 h 17 min	6 h 17 min	3,043 psi	
7 h 19 min	6 h 19 min		3,560 psi



San Mateo Bridge, San Francisco, CA



**Earthquake upgrading -
Using Rapid for Concrete and Grout**

Saving 1 week per bridge pillar



Due to the accelerated hardening, the floating dock was able to be moved to the next pillar quicker and reduce the overall project time.