

# TECHNICAL DATA SHEET

## Integral Hardening Admixture



# Hard-Cem<sup>®</sup>

## DESCRIPTION

Hard-Cem<sup>®</sup> is an Integral Hardening Admixture (IHA) used to protect concrete against abrasion and erosion. Hard-Cem is easily added to concrete during batching and its unique, mineral-metal microstructure makes concrete highly resistant to wear, erosion, surface chipping and dusting. Hard-Cem provides superior performance and replaces surface-applied products such as dry-shake hardeners and liquid hardeners/densifiers.



## RECOMMENDED USES

- Distributions Centers and Warehouses
- Manufacturing Facilities
- Big Box Retail Stores
- Conference and Convention Centers
- Shopping Centers and Malls
- Agricultural, Dairy and Seafood Facilities
- Vehicle Maintenance Facilities
- Waste and Recycling Facilities
- Loading docks and ramps
- Public Transportation Stations
- Roads, Bridges, and Overpasses
- Arenas and Stadiums
- Water & Wastewater Infrastructure
- Dams, Spillways and Power Plants
- Seawalls and Breakwaters
- Airport runways and aprons
- Marine Ports
- Healthcare Facilities
- Truck Terminals and Rail Yards
- Mining Infrastructure
- Military bases
- Film and Television Studios
- Car Dealerships
- Amusement Parks
- Water Parks and Skate Parks
- Parking Structures
- Storage Facilities

## FEATURES & BENEFITS

- Doubles the concrete wear life under harsh conditions
- Helps to maintain original finished appearance over time.
- Elimination of installation labor will improve quality control and expedite construction schedules
- Reduces or eliminates maintenance and or replacement of concrete, resulting in a more sustainable project
- Contributes to LEED points - Zero VOC - reduces jobsite waste – lowers the project's carbon footprint
- Easy to use; add directly to the concrete – no specialized spreading equipment needed
- Mixer-ready bags and bulk silo dispensing allows dust free use - helps worksites comply with OSHA silica exposure requirements
- Compatible with all cement types and supplementary cementitious materials (SCM's)
- Compatible with chemical admixtures, color pigments, metal and synthetic fibers
- Compatible with all concrete placing and finishing methods
- Avoids surface delamination after troweling that can occur with shake-on hardeners
- The only true hardener that can be used with air-entrained concrete
- Suitable for exposure to freezing weather and de-icing salts
- Suitable for wet environments (no surface rusting or staining from iron-based shake on products)
- Full depth hardening – compared to surface treatments that are only a few millimeters thick

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### PROPERTIES

Physical Properties	
Appearance	Dry Powder, black in color
Specific Gravity	~3.55
Bulk Density	1,650 kg/m <sup>3</sup> (103 lb/ft <sup>3</sup> )
Effects on Plastic Properties	
Slump, ASTM C143	No change
Setting Time, ASTM C403	No change
Entrained Air Content and Stability, ASTM C231	No change

Effects on Hardened Properties	
Compressive Strength, ASTM C39, C192, (28 Days)	No change
Drying Shrinkage	No change
Freeze / Thaw Durability, ASTM C666 (300 cycles)	Passes*
Deicing Chemical Resistance ASTM C 672, (50 cycles)	Passes*
Abrasion Resistance, ASTM C627 Robinson Floor Tester (5000 revolutions, mass loss)	2.9 times better wear resistance than control
Abrasion Resistance ASTM C779-C (ball bearings, wear depth)	2.0 times better wear resistance than control.
Surface Chipping, Impact Resistance ASTM 535 (Los Angeles Machine, mass loss)	1.6 times better chipping/impact resistance than control.

\*Tested in Air Entrained Concrete

### STANDARDS

- Compatible with all floor classifications in ACI 302.1R – Guide to Floor and Slab Construction
- Compatible with all Flatness and Levelness classes in ACI 117 - Specification for Tolerances for Concrete Construction and Materials
- Wear Classification: EN 13892-4 – Class AR0.5 (Severe Duty)
- Wear Resistance: BLY 7/by45, Bohme Abrasion – Class 1

### APPLICATION

See Application Instruction 8.11 for detailed use instructions.

For conventional concrete or shotcrete, dose Hard-Cem at 40 kg/m<sup>3</sup> (66 lb./yd<sup>3</sup>) and remove an equal weight of sand from the mix design to maintain proper mix proportions and water demand. For specialized applications such as screed or topping mixes, consult Kryton's Technical Services for a dosage recommendation. Hard-Cem is fully compatible with all commonly used cements, SCM's, admixtures and sealers. Bags can be added directly to the concrete mix without opening or may be opened and emptied into the concrete. A suitable dust mask, eye protection, gloves and coveralls are recommended when manually dispensing bagged product. When used in bulk, pneumatic conveying and dispensing of Hard-Cem is similar to that of Portland cement.

### PACKAGING

- 13.4 kg pulpable mixer ready bags; 3 bags per cubic meter of concrete
- 33 lb. pulpable mixer ready bags; 2 bags per cubic yard of concrete (Available in USA only)
- 1,600 kg (3,527 lb) super sacks
- Bulk pneumatic truckloads

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### SPECIFICATIONS

Specification language for this product is available at [www.kryton.com/technical-info/](http://www.kryton.com/technical-info/) or from your authorized Kryton representative.

### LIMITATIONS

The addition of Hard-Cem will not replace good concreting practices – acceptable results still require adherence to proper mix proportioning, placing, finishing, and curing practices.

### SAFETY

Read the Safety Data Sheet (SDS) for this product. For professional use only. Avoid contact with skin or eyes. Avoid breathing dust. Wear a dust mask, long sleeves, safety goggles and impervious gloves.

### SHELF LIFE

When stored in a dry enclosed area, Hard-Cem has a shelf life of at least 10 years.

### WARRANTY

Kryton International Inc. (Kryton) warrants that Kryton products are free from manufacturing defects and comply with the specifications given in their respective technical data sheet. Because conditions of use, such as site conditions, surface preparations, workmanship, concrete ingredients, weather, structural issues and other factors are beyond the control of Kryton, no warranty can be given as to the results of use. Purchaser agrees to seek the advice of qualified professionals and to determine for themselves the suitability of the products for their intended purpose and assumes all risks. Purchaser's sole remedy is limited to replacement of any product proven defective or at Kryton's option refund of the purchase price paid. THIS LIMITED WARRANTY CONTAINS THE ENTIRE OBLIGATION OF KRYTON. NO OTHER WARRANTIES, EXPRESS OR IMPLIED, SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. KRYTON SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. No representative of Kryton has the authority to make any representations or provision except as stated herein. Kryton reserves the right to change the properties of its products without notice.