

1. Product Name

ARMOR-HARD HDR

2. Manufacturer

METZGER/MCGUIRE

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3. Product Description

Armor-Hard HDR is a 100% solids, odorless, chemical resistant troweled epoxy flooring system. It's ideal for use in new or old damaged concrete floors and is designed to provide outstanding protection against a wide range of severe mechanical abuses typically found in industrial environments. Adhesion to concrete, wood and most metals is excellent.

Armor-Hard HDR was designed to protect interior floors from heavy industrial traffic (specifically, steel-wheeled carts and forklift trucks), making it ideally suited for industrial floors and anywhere a clean, durable floor surface is required. Application thickness can be varied from a 1/4" to 1/2" troweled topping depending upon project needs. The **Armor-Hard HDR Primer** is a required part of the flooring system to ensure maximum long term service.

Armor-Hard HDR Sealer is an optional companion product to the **Armor-Hard HDR**. **Armor-Hard HDR Sealer** is a 100% solids, odorless, chemical resistant epoxy sealer system designed to be applied over the **Armor-Hard HDR** to provide additional chemical resistance and enhanced ability for surface cleaning/maintenance.

4. Color and Packaging

Standard color options are Dovetail Gray, Standard Gray, Porpoise, Natural and Red. **Armor-Hard HDR** is conveniently packaged in pre-measured three (3) component kits, containing a resin (Part A), hardener (Part B), and a troweling aggregate (Part C). One premeasured kit (42#) will yield approximately 15 sf at 1/4" thickness. A larger bulk kit is available by special order. Bulk kit will yield approximately 90 sf at 1/4" thickness.

5. Handling Properties at 72°F

Consistency.....Trowelable Mortar
 Working Time, hours 1
 Gel Time, hours 2
 Tack Free Time (1/4" Thick), hours 3.5
 Initial Cure Or Foot Traffic Time, hours 4-5
 Full Cure (For Chemical Immersion), hours 48-72
Application Temperature: Ideal 70° to 80°F; 55° to 90°F is acceptable. Working life and tack free time will be extended at lower temperatures and reduced at elevated temperatures.

6. Technical Properties at 72°F

Property	Result	Test Method
Hardness, Shore D.....	86.....	ASTM D 2240
Adhesion to concrete, psi ...	> 500 (concrete fails)...	ASTM D 4541 (Tested with Armor-Hard HDR Primer)
Compressive strength, psi	10,500	ASTM D 695
Tensile strength, psi	1,400	ASTM D 638 or 4129)
Flexural strength, psi	3,700	ASTM D 790

7. Advantages

Ideal for use in new or old damaged concrete floors, **Armor-Hard HDR** provides outstanding protection against a wide range of severe mechanical abuses typically found in industrial environments. Adhesion to concrete, wood and most metals is excellent.

- 100% Solids
- Excellent Impact Resistance
- USDA/FDA/CFIA Acceptable
- Excellent Wear Resistance
- Environmentally Friendly
- Fast Walk-On Time

8. Chemical Resistance (28 Day Immersion @ 72°F)

Excellent Resistance

Motor Oil	10 % Lactic Acid Unleaded
Gasoline	10 % Nitric Acid
Gasohol	30 % Citric Acid
Kerosene	50 % Gluconic Acid
Diesel Fuel	10 % Acetic Acid
Xylene	50 % Sulfuric Acid
Ethyl Alcohol	10 % Hydrochloric Acid
Methanol	75 % Phosphoric Acid
Ethylene Glycol	50 % Sodium Hydroxide
Cyclohexanol	Bleach

Very Good

1, 1, 1-Trichloroethane
Toluene
70 % Sulfuric Acid
36 % Hydrochloric Acid
30 % Nitric Acid

Not Recommended

Methyl Ethyl Ketone
50 % Acetic Acid
50 % Nitric Acid
Methylene Chloride

9. Substrate Preparation/Building Environment

Armor-Hard HDR is used to strengthen and seal a porous concrete substrate, therefore, adhesion is paramount. To achieve maximum adhesion the substrate should be free of all loose and foreign materials and should be roughened to provide a coarse profile by either shot blasting or shaving/planing the concrete floor surface.

Before shot blasting, any contaminants on/in the concrete must be identified. Oils, grease, fats, waxes, or other contaminants must be removed prior to roughening the concrete. Contaminants can be removed with an application of warm (120-140°F) caustic detergent, a chemical cleaner/degreaser, steam cleaning or

9. Substrate Preparation/Building Environment (cont.)

pressure washing. Degrease the floor and follow with a hot water rinse. Repeat this process until the water does not "bead up" on the concrete.

Relative humidity and dew point must be determined before application to avoid adhesion failures. The dew point is used to predict the substrate temperature at which airborne moisture begins to condense, in the form of water, on the substrate.

Never apply a coating unless the concrete surface temperature is 5°F above the dew point. This temperature difference must be observed until the epoxy coating is cured to a tack free state. A dew point calculation chart is available by contacting Metzger/McGuire.

New concrete must have a minimum cure of 28 days prior to the application of **Armor-Hard HDR**.

10. Primer Application

Primer Mixing: **Armor-Hard HDR Primer** is a two component system. Both components (liquids A and B) should be stored or conditioned at 70-90°F (21-32°C) prior to mixing. Pour the hardener (B side) into the resin (A side) and blend thoroughly using a mixing paddle and slow speed hand drill for 3 minutes. Mix at slow speeds (less than 850 rpm) to avoid air entrainment. Do not mix more material than can be used within the stated working time. Remember - you will have less working time at higher temperatures. Working time is approximately 20 minutes at 72°F (22°C)

DO NOT apply **Armor-Hard HDR Primer** over standing water. Damp or dry concrete is acceptable.

Primer Application: **Armor-Hard HDR** can be applied by brush or short nap roller. Do not thin primer! Do not over-apply or allow to puddle. A thin, uniform coat is preferred. Do not apply to concrete colder than 50°F (10°C) as insufficient curing may result.

Coverage: 100-300 square feet per gallon depending upon surface porosity and profile.

11. Mortar Application

Mixing: To mix **Armor-Hard HDR**, gradually pour the contents of the Part B Hardener into the larger Part A Resin can. Immediately mix for 3 minutes using a Jiffy Mixer and a slow speed drill. Mix at slow speed (less than 850 rpm) to avoid air entrainment. DO NOT mix more material than can be used within the stated working time. Add this liquid to a rotating pail mixer and add half of the troweling aggregate, let mix for 1-2 minutes, then add the remaining troweling aggregate and mix for an additional 3 minutes.

Application: Immediately pour out the mixed kit onto the floor in 7-10" wide strips. Spread evenly with a clean trowel (steel finishing trowel, 3 x 14). Finish placement of each kit before mixing another to insure proper working times and surface textures. As the material begins to set up, the trowel will pull on the mortar, creating a porous surface. This can be corrected by cleaning the trowel with denatured alcohol, isopropyl alcohol or acetone. Lightly misting the surface with one of these solvents is also acceptable.

Application (continued):

The **Armor-Hard HDR** can be applied to the **Armor-Hard HDR Primer** immediately or up to 24 hours later at 72°F. If more than 24 hours have passed, and if primer is no longer tacky, it is necessary to mechanically abrade the primer surface prior to installing the **Armor-Hard HDR**.

Do not rapidly raise the air or substrate temperature; this can cause outgassing of the concrete and joint shrinkage. This also can lead to product cracking or failure.

12. Alternate Mortar Application Methods

*** **Armor-Hard HDR** may be applied with a grout box and finished with a power trowel. Please contact our technical department for additional guidance on these application methods.

13. Clean Up

Armor-Hard HDR before it has hardened, can be removed from tools with solvent or warm soapy water.

14. Shelf Life and Storage

Armor-Hard HDR has a guaranteed shelf life of twelve (12) months if containers remain unopened. Store in dry, cool areas away from excessive heat, freeze/thaw and sunlight.

15. Safety Precautions

Armor-Hard HDR is an epoxy resin system and is for professional use only. Use only in well ventilated areas and practice all normal job site safety precautions and use NIOSH approved breathing apparatus at all times. Please refer to the Material Safety Data Sheets prior to using this product. Do not weld on or near the hardened epoxy, hazardous fumes will be released.

16. Material Warranty

WARRANTY: Metzger/McGuire Co. solely and expressly warrants that its **Armor-Hard HDR** shall be free from defects in material and workmanship for 365 days from the date of purchase. Unless authorized in writing by an officer of Metzger/McGuire, no other representations or statements made by Metzger/McGuire or its representatives, in writing or orally, shall alter this warranty. Metzger/McGuire makes no warranties, implied or otherwise, as to the merchantability or fitness for ordinary or particular purposes of its products and excludes the same. If any Metzger/McGuire product fails to conform with this warranty, Metzger/McGuire will replace the product at no cost to the purchaser. Purchaser's sole remedy in any case shall be limited to the purchase price or replacement cost of product and specifically excludes labor and the cost of labor, lost wages and opportunity costs, and all other possible incidental, consequential or special damages resulting from any claim of breach of warranty, breach of contract, negligence or any legal theory. Any warranty claim must be made within one (1) year from the date of material purchase. Metzger/McGuire does not authorize anyone on its behalf to make any written or oral statements which in any way alter the installation procedures or written installation instructions published in its product literature or on its packaging labels. Any installation of Metzger/McGuire products which fails to conform with such installation information or instructions shall void this warranty. Purchaser shall be solely responsible for determining the suitability of Metzger/McGuire's products for the purchaser's intended purpose.