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Surface Protection Design & Installation

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History

Founded in **1910**, Knight Material Technologies (KMT) designs, installs, services and manufactures custom acid-resistant linings used in highly corrosive processes for the chemical and mining industries worldwide.

In **1981**, Koch Engineering Company, Inc., of Wichita, Kansas, bought Knight, which then became Koch Engineering Knight Division. Knight's expertise was a welcome addition to the Koch family of companies working in the refining, chemical and petrochemical industries.

In a transfer of ownership from Koch Engineered Solutions in **2021,** Knight became Knight Material Technologies LLC. The new ownership led to investment in capital equipment and an expanded workforce.

In **2022**, Knight acquires Electro Chemical Engineering and Manufacturing Co., a leader in high-performance fluoropolymer-lined vessels.

Ref. https://knightmaterials.com/history-timeline/

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Introduction – About Knight Solutions

Knight Material Technologies, LLC has been a global leader in corrosion proof systems and linings and is the single source for all the most demanding corrosion solutions.

With products and services that are available worldwide through our global network of manufacturing and outsourcing facilities, we offer the engineering experience, specialized products and solution capabilities to protect your facility and operation from aggressive chemicals and other corrosive elements.

Our specially formulated bricks, mortars, epoxy and laminate materials offer the greatest protection in corrosion and acid resistance. We provide multiple finishes, from slip-resistant texture to smooth, easy-to-clean surfaces, promoting safety and security in any traffic area.

Knight's long history of corrosion proof systems extend past process equipment. With increased capabilities in manufacturing, experienced driven engineering, customer-oriented service and broad range of products promote a full-service corrosion and chemical protection provider.

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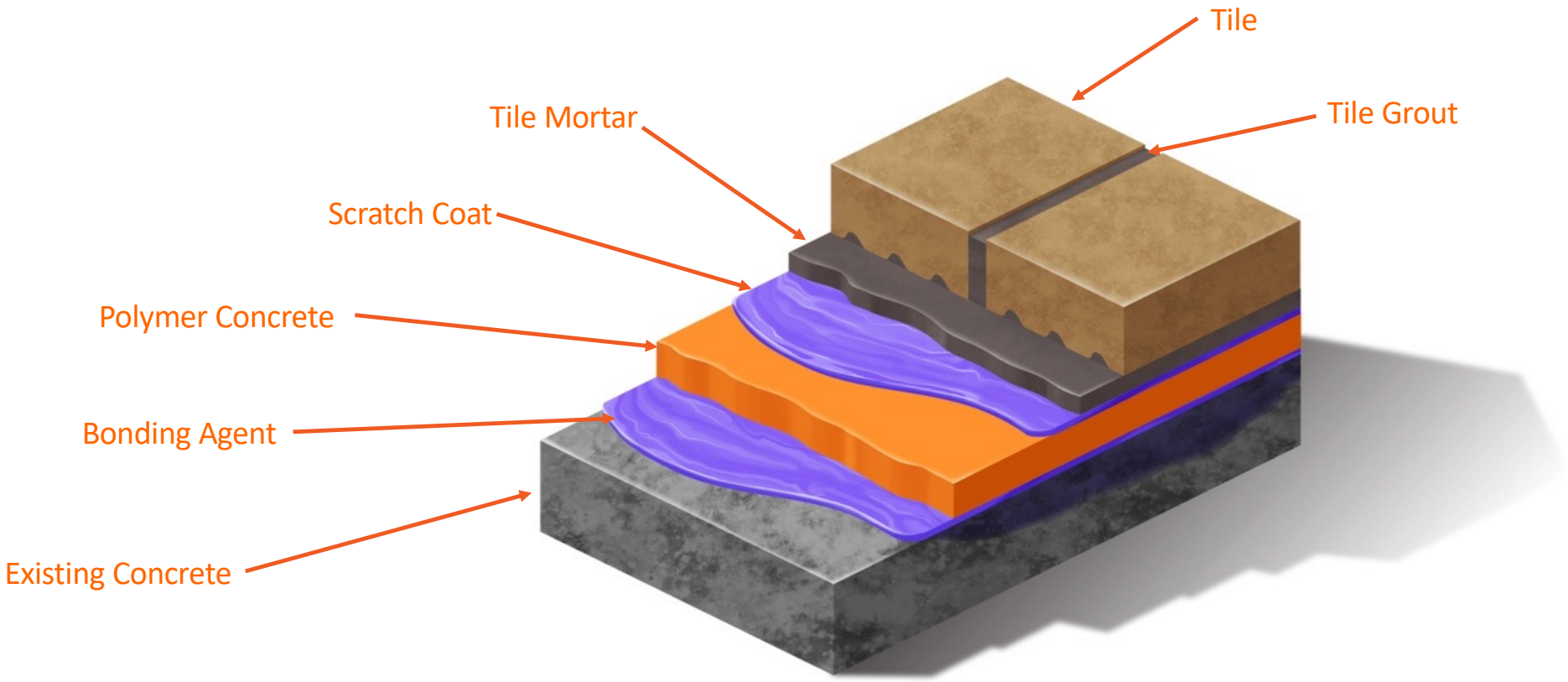
Polymer Concrete and KNIGHT-GARD Tile System



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What To Look For

- Most of these acids we at Knight deal often with:
  - Chromic Acid VI
  - Sulfuric Acid up to 98%
  - Nitric Acid
  - Hydrochloric acid
  - Copper Sulfate

- Areas to look for within a facility:
  - Sump pits
  - Containment areas
  - Trenches
  - Loading docks
  - Foundation Supports

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Damaged Flooring

- Cracking concrete
- Years of coatings peeling up
- Chemicals were settling underneath the concrete

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Surface Preparation - Concrete Demolition

- Scarifying, jack hammer or hydro demolition are methods used to remove the contaminated concrete.
- Typical depth of concrete removal is 2” thick. Based on the pH level after removal additional demolition may be necessary. (Ideal pH level is >9)

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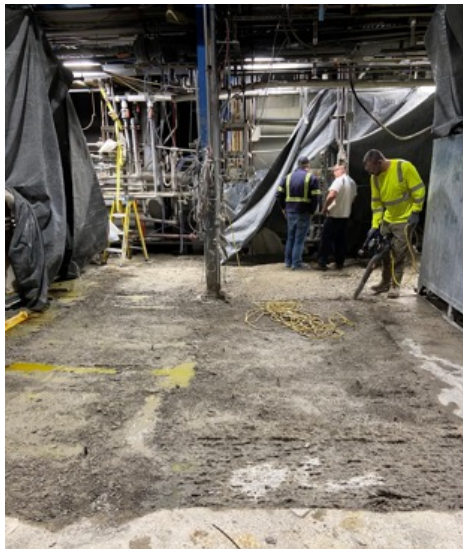
Surface Preparation: Hydrodemolition a different way

- The first step is to wash the area before starting to remove any debris and chemicals on the surface.
- Demo surface with Hydro Demolition Equipment.
- After the demo is complete the area gets pressure washed to remove water and loose debris.



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Surface Preparation

Hydrodemolition Robot in action. Advantage no personnel in the area.

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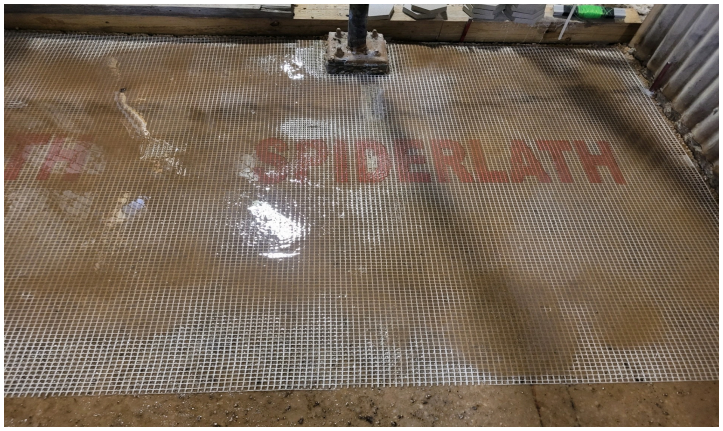
Recuperate Concrete Floor With Polymer Concrete

- Once the area is dry, we apply a humidity tolerant Primer over the entire area. Vinylester does not work as it saponifies. We need to use an Epoxy resin.
- Mix polymer concrete according to our developed “recipe”.
- The right pictures shows the polymer concrete just after finishing pouring and after it has set up.
- The bottom picture is of the scratch coat applied on top of the polymer concrete needed to level out irregularities of the surface.
- On top in a 1mm thick scratch coat we embed a scrim to add a crack bridging capacity to the new polymer concrete.



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Recuperate Concrete Floor With Polymer Concrete

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Polymer Concrete

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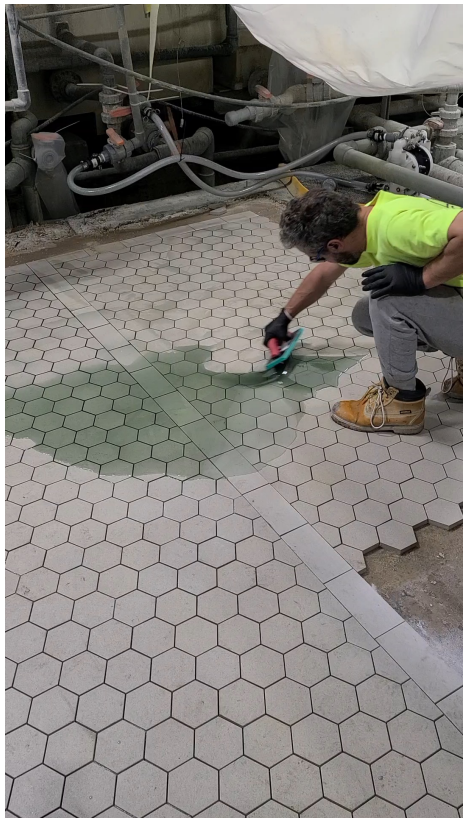
Installation of Tiles



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Tile Setting

- Before the tiles are set the tops are coated with a wax to prevent the resin from sticking to them.
- The mortar consists of three finer sands and resin similar to the scratch coat but a thicker consistency.
- The mortar is spread 4-6 mm thick.
- A border of rectangular tiles are first set using straight edges and chalk lines.
- The tiles are set and individually tapped by hand to be level with the tiles around it.
- After the mortar and tile have time to set up a thin mix of fine sands and resin is spread over top of the tile where a grout machine is used to push this mix in between all the tiles.
- Once the grout has cured a steam pressure washer is used to clean the wax off the tiles.

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Beams and Columns

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Columns with glassfiber rebar

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Single source for all the most demanding corrosion solutions. Our products and services are available worldwide through our global network of manufacturing and outsourcing ceramic and plastic facilities.

Refer to our website for further details: **www.knightmaterials.com**