



# Repair Damaged Gypsum Concrete Underlayments

## APPLICABLE PRODUCTS

### FIRM-FILL® 3310+

3,000 to 3,900 psi  
(20.7 to 26.9 MPa)

A premium poured floor underlayment, delivers best in class performance. Ideal over wood or concrete subfloors in multi-family, hospitality, and renovation projects,

### FIRM-FILL® 4010

Up to 5500 psi  
(Up to 37.9 MPa)

An exceptionally durable cementitious underlayment for thin capping of concrete on projects requiring the highest compressive strength

### Hacker Floor Primer

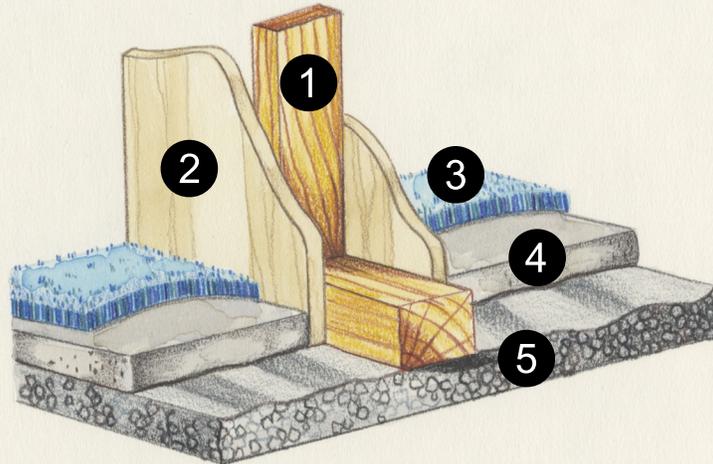
A water based, rewettable polyvinyl acetate (PVA) or latex emulsion that is designed to enhance the bond between a FIRM-FILL® Gypsum Concrete and existing structural substrate (wood or concrete).

### Hacker TopCoat®

An acrylic based, film-forming surface preparation agent designed to meet ASTM F2419-05 compliance requirements for use on Thick Poured Gypsum Concrete Underlayments specified to receive resilient floor coverings.

### Hacker Floor Sealer

A clear, water based, vinyl acrylic copolymer sealer; recommended over Hacker Floor Underlayments.



- ① Stud
- ② Gypsum Wallboard
- ③ Finished Floor Covering
- ④ Firm-Fill® Gypsum Concrete
- ⑤ Concrete Subfloor

Gypsum Floor Underlayments are installed by adding water and sand to a specially formulated gypsum binder powder at the jobsite. Care must be taken by the gypsum underlayment contractor to ensure that the gypsum manufacturers' recommended mixing instructions are followed. This does not always happen and the contractor may have added too much sand or too much water or a combination of both. When this happens, the resultant gypsum underlayment will exhibit flaws such as cracks, and/or a soft, chalky surface.

During the renovation of multifamily complexes, the removal of the old finished floor covering and pad products will expose the gypsum underlayment. In some cases, the surface will exhibit the defects described above. The problem is simple – the old gypsum underlayment is not suitable to support the 'hard surface' products being used today. In addition, damaged gypsum floors bring with it the following issues:

1. The soft, chalky surface is not a good host for the use of adhesives or mastics. A soft, chalky surface will pull water out from the adhesive or mastic which will render the adhesive or mastic useless as there will be no adhesion between the adhesive and the gypsum underlayment.
2. Any cracks or surface blemishes will transfer through to the surface of flexible products like VCT after the adhesive has completely dried.
3. Floors will lack the durability needed to sustain foot traffic (especially high heels) or point loads from furniture and appliances because the old gypsum underlayment lacks enough compressive strength to withstand the load.

*Note:* Before conducting a repair of damaged gypsum floor underlayments, learn the nature, cause and depth of the problem before repair. For example, if the problem is caused by a flawed or defective subfloor under the underlayment, it must be repaired first.



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## **Gypsum Floor Repair**

The information provided is based on Hacker Industries, Inc.'s best knowledge and research to date. We highly recommend contacting Hacker Industries, Inc.'s technical services department to discuss circumstances not covered below.

### **Pre-Pour**

1. Once the gypsum underlayment floor has been exposed, an inspection must be done to the existing gypsum floor to ensure it is completely dry and stable. Typical characteristics of a floor needing rehabilitation include: surface softness, chalkiness, cracks, surface deformation or irregularities and loose gypsum that is no longer secured to the plywood or OSB subfloor.
2. Remove any loose gypsum that is no longer adhered to the subfloor. Sweep the old gypsum surface with a stiff, bristle broom. Use a HEPA vacuum after sweeping to remove as much dust as possible.
3. Note that the gypsum underlayment must be at least  $\frac{3}{4}$ -inch (19 mm) thick over the subfloor. If it is not, a Firm-Fill® Gypsum Concrete Underlayment (GCU) must be installed in all areas to achieve an overall thickness of the floor of  $\frac{3}{4}$ -inch.
  - a. To determine the gypsum underlayment depth, core the floor by drilling through the gypsum until the wood subfloor is detected.
4. Apply two coats of Hacker Floor Sealer underlayment. Apply the sealer solution with a soft bristle broom to insure you get 100% penetration.
  - a. When first coat is completely dry, apply second coat of Hacker Floor Sealer.

## **Resurface Damaged Gypsum Concrete Underlayment**

There are two methods to resurfacing damaged gypsum concrete underlayments depending on the condition of the damaged gypsum concrete, a trowelable method and a pourable method. Both methods require Firm-Fill® GCU to be mixed with sand and water on-site. Contact Hacker Industries, Inc. for proper mixing instructions. Also, take into account the height of the finished floor covering and any sound attenuation product that may be used.

### **Trowelable Method**

If the damaged gypsum requires only shallow repairs to achieve a flat surface, the damaged gypsum can be patched by using a trowel to install new, Firm-Fill® GCU.

1. Apply a coating of Hacker Floor Primer rewettable polyvinyl acetate.
2. Install Firm-Fill® GCU by troweling it over the areas that need repair.
4. When the Firm-Fill® GCU is completely dry, approximately 3-5 days, depending on depth of pour, apply a coating of Hacker TopCoat® surface preparation agent.  
*Note:* Hacker TopCoat® must be applied within 2-4 hours of installation of finished floor coverings.



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## **Pourable Method**

If the damaged gypsum flooring requires deep repairs, or the entire surface needs to be covered with Firm-Fill® GCU to achieve a new, flat surface, Firm-Fill® GCU will need to be poured in place.

1. Apply a coating of Hacker Floor Primer rewettable polyvinyl acetate.
2. Pour Firm-Fill® GCU over damaged floor.
  - a. The Firm-Fill® GCU can be installed from a feathered edge up to 3-inches (76 mm) deep.
3. Foot traffic can resume on the Firm-Fill® GCU within two hours. Complete drying time takes approximately 10-14 days.
4. Once the Firm-Fill® GCU is completely dry, apply a coating of Hacker TopCoat® surface preparation agent.

*Note:* Hacker TopCoat® must be applied within 2-4 hours of installation of finished floor coverings.

## **Drying Conditions**

The ventilation and drying of Firm-Fill® GCU is critical. The General Contractor (GC) shall provide continuous ventilation and heat before, during, and after installation of Firm-Fill® GCU. If necessary, the GC shall provide mechanical ventilation. Under these optimum conditions, a 1" thick pour of Firm-Fill® GCU should usually dry in 10-14 days. If the air is not circulated between the interior and the exterior of the building, little or no drying takes place.

## **Installation of Finished Floor Coverings**

Prior to the installation of any sealers, primer/surface preparation, top coats or finished floor coverings, the Firm-Fill® GCU shall be tested for dryness. Do not install floor coverings until Firm-Fill® GCU is completely dry. The recommended procedure to test for dryness is to use a moisture meter with a gypsum scale. Hacker Industries, Inc. recommends three moisture meters:

- Delmhorst BD-2100
- Delmhorst G-79
- Tramex CRH

Calcium chloride test method shall not be used.

The GC shall consult the flooring contractor for recommended procedures to test for dryness and acceptable levels of moisture. To avoid potential problems during the drying process, the GC shall consult Hacker Industries, Inc.'s Drying Conditions Flyer and information contained on Hacker Industries, Inc.'s website for additional information concerning drying of the Firm-Fill® GCU.



# Repair Damaged Gypsum Concrete Underlayments

## WARRANTY

HACKER INDUSTRIES, INC. SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES, DIRECTLY OR INDIRECTLY SUSTAINED, NOR FOR ANY LOSS CAUSED BY APPLICATION OF THESE GOODS NOT IN ACCORDANCE WITH CURRENT PRINTED INSTRUCTION OR FOR OTHER THAN THE INTENDED USE. OUR LIABILITY IS EXPRESSLY LIMITED TO REPLACEMENT OF DEFECTIVE GOODS. ANY CLAIM SHALL BE DEEMED WAIVED UNLESS MADE IN WRITING TO US WITHIN 30 DAYS FROM DATE IT WAS, OR REASONABLY SHOULD HAVE BEEN, DISCOVERED.

## PRODUCT INFORMATION

Visit [HackerIndustries.com](http://HackerIndustries.com) for the most up-to-date product information.

## SAFETY FIRST

Follow good safety/industrial practices during installation. Wear appropriate personal protective equipment. Read SDS and literature prior to specification and/or installation.

## TRADEMARKS

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## Notes and Limitations

1. Do not use in exterior applications.
2. Do not install where continuous exposure to moisture is a possibility.
3. Do not install over dimensionally unstable, improperly prepared, weak subfloors.
4. Do not use oil-based sweeping compounds to clean and prepare the old gypsum underlayment. Use of such sweeping compounds leaves an oil film on the surface of the underlayment. Use vacuum, compressed air or a dry broom to remove the dust and debris.
5. If the old gypsum underlayment was previously covered with a flooring product that was glued or otherwise adhered to the surface of the gypsum underlayment, do not use adhesive-removing chemicals or solvents to eliminate contaminants from the old gypsum underlayment. Use of such chemicals can transport oil, grease, and other contaminants further into the gypsum underlayment. These chemicals can migrate back to the surface at a later time to interfere with the floor-covering adhesives, thus compromising the bond performance. Mechanically removing the organic adhesives, asphalt, coal-tar based adhesives and other oil-based contaminants is the sole recommended method of preparing the gypsum underlayment. Use mechanical removal methods such as scraping, scarifying or sanding to clean and prepare the old gypsum underlayment contaminated with adhesives, asphalt or oil. Do not apply over subfloors containing asbestos. Do not mechanically remove organic adhesives, asphalt, coal-tar based adhesives or other materials containing asbestos.
6. Do not overwater or over mix the trowelable or pourable Firm-Fill® GCU products.
7. Do not add any chemical additives or polymers to the Firm-Fill® GCU products.
8. Do not mix with other products or self-leveling materials.
9. Structure shall be designed so that deflection does not exceed L/240 from combined dead and live loads and L/360 from live loads. Certain floor coverings such as marble, limestone, travertine and wood may have more restrictive deflection limits. Consult the appropriate floor-covering manufacturer.
10. All subfloors must be structurally sound, stable and solid. Please be advised that old gypsum underlayments may have compressive strengths below 1,000 psi (6.9 MPa). Most manufacturers' resilient vinyl tile or vinyl plank compressive strength requirements specify a minimum of least 3,000 psi (20.7 MPa) – some manufacturers may require compressive strengths exceeding 3,500 psi (24.1 MPa). It is very difficult to measure the existing compressive strength of a gypsum subfloor without the use of an instrument such as a Windsor Pin Test System, manufactured by James Instruments ([ndtjames.com](http://ndtjames.com)). Special consideration must be used when evaluating a low compressive strength underlayment. A thin coating of a troweled or poured repair product may not be able to withstand heavy loads, especially point and rolling loads when the repair product thickness is less than ½ in. (13 mm). For a pourable solution that requires a thickness of ½ in. (13 mm) or less, Firm-Fill® 4010 is recommended. A judgment call must be made by the repair contractor as to whether the existing gypsum underlayment is strong enough to support the repair. Note - Hacker Industries, Inc. is not liable for failures from pre-existing materials.

## Hacker Industries, Inc.

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