

# USG LEVELROCK® BRAND FLOOR UNDERLAYMENT

RH FR

RH GREEN FR

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**Premium fiber-reinforced (FR) poured floor underlayment for radiant heat systems**

- Fast application, fast-setting allows for return of light trade traffic within hours
  - UL designs available up to 2-hour fire rating
  - Provides smooth surface with improved impact resistance
  - Enhances crack reduction and reduces further propagation
  - Cost-effective reinforcement solution with improved load distribution
  - Helps maximize sound isolation between floors/units
  - USG Levelrock RH Green FR floor underlayment may assist in obtaining LEED® credits
  - Applied by USG Levelrock authorized applicators
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**DESCRIPTION**

USG Levelrock® Brand RH FR Floor Underlayment and USG Levelrock® RH Green FR Floor Underlayment are fast-applying engineered cementitious underlayments reinforced with fibers that improve impact strength. Designed for interior residential construction (for commercial construction use USG Levelrock® Commercial RH FR or Commercial RH Green FR Floor Underlayment), USG Levelrock RH FR and RH Green FR engineered cementitious underlayments are formulated specifically for electrical and hot water radiant heat floor installations. Tough compressive (from 2500 to 3500 psi at a ¾ in. minimum thickness, up to a 3 in. maximum thickness) and surface strengths provide long-term resistance to trade activity typical of single- and multi-family home construction. Cost-effective, these engineered cementitious underlayments also accept virtually all types of floor coverings such as ceramic tile, carpeting and wood.

The non-shrinking nature of USG Levelrock RH FR and RH Green FR floor underlayments locks hydronic tubes and electric cables in place, preventing noise and tube chafing, while the special formulation is designed to be used within the elevated operating temperature ranges associated with radiant heat floors. In addition to locking the tubes and cables in place, the direct contact of USG Levelrock RH FR and RH Green FR floor underlayments provides for efficient transfer of heat to the underlayment by eliminating any air space that may act as an insulator and lower heat transfer efficiency.

USG Levelrock RH Green FR floor underlayment is made with recaptured gypsum, from the flue gas desulfurization of the process used to clean combustion gases from fossil-fuel-burning power plants. This process is used to greatly reduce emissions of sulfur dioxide which helps the environment by reduction of harmful acid rain. The use of this recaptured gypsum also eliminates the need to dispose of the material in landfills as a solid waste. In addition, the high recycled content of USG Levelrock RH Green FR floor underlayment may assist in obtaining LEED MR credits for Recycled content, while both USG Levelrock RH FR and RH Green FR floor underlayment that are mixed on site using local water may also assist in obtaining LEED MR Regional credits.

USG fiber-reinforced cementitious underlayment products are mixed with sand and water at the job site to yield a lightweight slurry. Most hydronic radiant heat jobs will be poured at 1-1/2 in. total thickness to cover the tubes. Encasing electrical radiant heat systems typically requires less material. There should be a minimum thickness of ¾ in. of USG Levelrock RH FR or RH Green FR floor underlayment above the cables. Most electrical systems' typical total thickness (including USG Levelrock RH FR or RH Green FR floor underlayment) may be at a 1-in. thickness. A 1-1/2-in.-thick underlayment weighs approximately 15.5 lbs./sq. ft. and has an approximate dry density range of 117-123 lbs./cu. ft.

USG fiber-reinforced engineered cementitious underlayment systems provide an economical way to achieve lightweight, fire-resistant, smooth and monolithic floors in residential and light-commercial construction. When used with USG Levelrock® Perimeter Isolation Strip, USG Levelrock RH FR and RH Green FR floor underlayments provide an enhanced system to reduce potential cracking and further crack propagation. Typical applications are less labor intensive than many other types of construction and provide high fire ratings. Designed sound systems provide for improved STC and IIC ratings when used with USG Levelrock® sound attenuation products.

## WARRANTY

A 10-year limited system warranty applies when using USG Levelrock RH FR and RH Green FR engineered gypsum cements sealed with USG Durock™ X2 primer-sealer and a XL Brands® manufactured adhesive. Please contact USG for further details.

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## LIMITATIONS

1. Do not use in exterior applications.
  2. Do not use as a wear surface.
  3. Do not install where continuous exposure to moisture is a possibility.
  4. Do not install in below-grade applications.
  5. Do not use with radiant heat systems having prolonged operation temperatures exceeding 140 °F.
  6. For wood subfloors, install only on tongue-and-groove edge plywood or OSB, or square-edge wood subfloor with back-bracing.
  7. Do not use over expansion or isolation joints. Continue all movement joints in the concrete slab up through the layer of underlayment. In areas where the expansion or isolation joints are not present in the floor or where the concrete slab has developed systematic cracks in response to slab movement, consult with an engineer on the project or request the services of a professional structural engineer to provide such joints as part of the system in accordance with engineering requirements and industry standards.
  8. 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.
  9. Adhere to the Radiant Professionals Alliance's *RPA Guidelines for the Design and Installation of Radiant Panel Heating and Snow/Ice Melt Systems 2010 Edition* (see [radiantprofessionalsalliance.org](http://radiantprofessionalsalliance.org)) regarding temperature and fluid temperatures. Fluid temperatures of radiant systems shall not exceed 140 °F at the exit of the heating device. To limit risk, floor temperatures shall not exceed 90 °F in general and shall be limited to 85 °F in areas of direct contact by building occupants. Follow the RPA Guidelines for specific instructions regarding various floor coverings. To minimize any potential of shocking the USG Levelrock RH FR or USG Levelrock RH Green FR floor underlayment, the radiant heat system should be ramped up slowly over several days until the underlayment is fully dry. Start up of radiant systems shall be in accordance with manufacturers' recommended start-up procedures.
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## INSTALLATION

During the entire installation process, the building must be enclosed and temperature maintained at a 50 °F minimum until permanent heating is available. Adequate ventilation must be provided to ensure uniform drying of the installed floor underlayment, which typically occurs within 14 to 17 days at a 1-1/2 in. thickness. Protect floors from heavy trade traffic loads (i.e. loaded drywall carts, heavy tool cabinets, etc.) with plywood. This may cause the protected areas to take longer to dry. Check for dryness in these areas before installing floor covering. Ensure that all hydronic piping or radiant heat mats are firmly attached to the subfloor. For applications over plywood or oriented strand board (OSB), the application of USG Levelrock™ Wood Primer to the subfloor is necessary to provide maximum bond between the underlayment and subfloor.

Concrete subfloors receiving USG Levelrock RH FR/RH Green FR underlayment systems must be cured properly (generally for a minimum of 28 days) prior to the underlayment installation. For on- or above-grade applications on concrete subfloors or concrete planks, measure the Moisture Vapor Emission Rate (MVER) using ASTM F1869. MVER should be below 5 lbs./1000 sq. ft./24 hrs. Contact USG for further information. Concrete subfloors should be treated properly with USG Levelrock™ Acrylic Concrete Primer, according to USG recommendations. Refer to *USG Levelrock Floor Underlayment Finished Floor Installation Guidelines* (IG1457) for floor covering installation.

Cracks in the existing concrete subfloor must be inspected to determine if the crack is due to typical concrete "shrink" or if it is a result of a structural movement. In the case of the latter, remediation of the crack must be addressed or eventually the crack will telegraph through USG Levelrock RH FR and RH Green FR floor underlayments. Repair all existing cracks in old and new concrete to minimize and control their ability to telegraph through the layer of USG Levelrock RH FR and RH Green FR floor underlayments. Remove the weak concrete along the length of the cracks by chiseling or other suitable means. Remove accumulated dust and debris from the crack cavities using a vacuum or other suitable means. Various cracks present in the concrete subfloor including shrinkage cracks must be filled with a suitable commercially available crack-fill epoxy adhesive designed for concrete flooring applications. To ensure superior resistance to crack growth, use injection epoxy crack-repair techniques per industry guidelines to repair cracks that are active or deep. Note that repair of existing cracks in the concrete subfloor only subdues, but does not completely prevent their ability to telegraph through USG Levelrock RH FR and RH Green FR floor underlayments. Growth of existing cracks or formation of new cracks in the concrete subfloor can lead to cracks telegraphing through USG Levelrock RH FR and RH Green FR floor underlayments. Respect existing expansion and control joints (see *Limitations #7*, pg. 2).

**INSTALLATION CONT.**

To minimize the effect of expansion and cracking on outside corners, use USG Levelrock perimeter isolation strip. See *USG Levelrock Brand Perimeter Isolation Strip Submittal* (IG1874) for further details.

For further details on installation requirements, specifications and the most up-to-date product information, please see [usg.com](http://usg.com) or [pourlevelrock.com](http://pourlevelrock.com).

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**PRODUCT DATA**

**Approximate Compressive Strength (aggregated) ASTM C472 (modified):** 2500-3500 psi\*

**Approximate Dry Density (aggregated):** 117-123 lbs./cu. ft.

**NOTE** \*Compressive strengths published herein were achieved under controlled laboratory conditions. Actual field results may differ due to environmental conditions, regional sand variations, inconsistent proportioning of field applied water, sand and USG Levelrock floor underlayment, as well as differences in mixing/pumping equipment.

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**UL DESIGNATION TYPE LRK**

G524, G230, G516, G535, G551\*, G553\*, G556, G561, G562, G564\*, G566, G587, G588, G591, J917, J919, J920, J924, J927, J931, J957, J958, J991, J994, L006, L201, L206, L208, L209, L210, L211, L212, L501, L502, L503, L504, L505, L506, L507, L508, L509, L510, L511, L512, L513, L514, L515, L516, L517, L518, L519, L520, L521, L522, L523, L524, L525, L526, L527, L528, L529, L530, L532, L533, L534, L535, L536, L537, L538, L539, L540, L541, L542, L543, L545, L546, L547, L549, L550, L551, L552, L556, L557, L558, L559, L562, L563, L564, L565, L568, L569, L570, L571, L573, L574, L577, L579, L581, L583, L585, L587, L588, L589, L590, L592, L593, M500, M501, M502, M503, M504, M505, M506, M508, M510, M511, M513, M515, M517\*, M521\*, M522\*.

For the most up-to-date UL Designation Type LRK, contact your USG representative.

**NOTE** \*UL Design requires greater minimum pour depths and compressive strengths and/or additional requirements. See individual UL Designs for specifics.

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**SUBMITTAL APPROVALS**

<b>Job Name</b>	
<b>Contractor</b>	<b>Date</b>

**PRODUCT INFORMATION**

See [usg.com](http://usg.com) or [pourlevelrock.com](http://pourlevelrock.com) for the most up-to-date product information.

**LEED INFORMATION**

For the most up-to-date information on LEED rating systems, project certification and the U.S. Green Building Council, please visit [usgbc.org](http://usgbc.org).

**DANGER**

Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. May cause respiratory irritation. May cause cancer by inhalation of respirable crystalline silica. Do not handle until all safety precautions have been read and understood. Avoid breathing dust. Use only in a well-ventilated area, wear a NIOSH/MSHA-approved respirator. Wear protective gloves/protective clothing/eye protection. If swallowed, inhaled, or skin irritation occurs get medical attention. If on skin: Wash with plenty of water. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses and continue rinsing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Dispose of in accordance with local, state, and federal regulations. For more information call Product Safety: 800-507-8899 or see the SDS at [usg.com](http://usg.com).

**KEEP OUT OF REACH OF CHILDREN.**

**TRADEMARKS**

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**NOTICE**

We 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 thirty (30) days from date it was or reasonably should have been discovered.

**SAFETY FIRST!**

Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read SDS and literature before specification and installation.

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[usg.com](http://usg.com)  
[pourlevelrock.com](http://pourlevelrock.com)  
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Manufactured by  
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IG1920/8-15  
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