

# Finished Flooring Preparation & Installation Guidelines

**USG LEVELROCK® BRAND  
& USG DUROCK™ BRAND**  
SELF-LEVELING GYPSUM  
UNDERLAYMENTS

# USG LEVELROCK® AND USG DUROCK™ GYPSUM UNDERLAYMENTS

From commercial to multi-family projects, renovation to new construction, USG Levelrock® Brand and USG Durock™ Brand self-leveling gypsum underlayments pour on the strength. Stronger Than Concrete™ fast-applying gypsum engineered cements and flooring systems offer the industry's highest compressive strengths with exceptional acoustical performance to reduce noise between floors and units. USG Levelrock and USG Durock™ gypsum underlayments provide smooth, crack-resistant surfaces that accept virtually all types of floor coverings including luxury vinyl, sheet vinyl, vinyl composition tile, porcelain tile, ceramic tile, laminate, glue-down hardwood and carpet.

Created for a wide range of applications, USG Levelrock and USG Durock™ gypsum underlayments are available in several formulations specifically designed for radiant heat, corrugated steel deck and eco-friendly applications. USG Levelrock and USG Durock™ products and systems are designed to meet the new International Building Code (IBC) and were the first to ensure that all sound systems are fire-rated and easily specified by a UL Design number. USG Levelrock and USG Durock™ gypsum underlayments provide approximate compressive strengths ranging from 2,000 psi to 10,000 psi (13.8 MPa to 68.9 MPa)\*, to suit a variety of applications.

**Note** \*Commercial floor applications recommend underlayments with minimum compressive strengths of 3,500 psi (24.1 MPa). In addition, the Tile Council of North America recommends a minimum of 2,000 psi (13.8 MPa) as well as the use of a crack isolation membrane such as USG Durock™ tile membrane for all tile installations.

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## GENERAL RECOMMENDATIONS

In all cases, follow floor-covering manufacturer's installation recommendations to maintain floor-covering manufacturer's warranties.

Before applying any of the USG floor treatments and the floor-covering, all surfaces must be clean and free of oil, paint, chemicals, wax, grease, dust, dirt and other construction debris.

The use of sweeping compounds on USG Levelrock and USG Durock™ gypsum underlayments is not recommended, as these products often contain oil, which can cause a poor bond between the USG Levelrock and USG Durock™ gypsum underlayments and the adhesive or mortar used to attach the floor goods.



## UNDERLAYMENT REQUIREMENTS

### RESPONSIBILITY FOR DRYING ENVIRONMENT

USG Levelrock and USG Durock™ gypsum underlayments must be installed between 50 °F (10 °C) and 95 °F (35 °C) at the time of application and for 72 hours after installation of the gypsum underlayment. The general contractor must be made aware of these conditions at the job meeting and is responsible for ensuring that they are met. The best and easiest way to accelerate the drying process (after allowing a minimum of 3 hours for setting) is by putting a fan on the floor and cracking the windows (even in winter) to ensure good air movement and air exchange. If the HVAC system in the building is operational, that should be turned on as well. However, this is not always possible (especially in new construction) because of the concern for construction dust being blown throughout the building.

If poor drying conditions are encountered (i.e. high humidity), then strong consideration should be given to utilizing mechanical desiccating ventilators such as those manufactured by Polygon Group US — formerly Munters — ([polygongroup.us](http://polygongroup.us)). In all cases, the use of fans is still recommended. Portable heaters should be used in cooler climates, but must be used in conjunction with adequate ventilation to ensure proper air exchange. The by-product of ‘salamander’ type heaters and some other types of kerosene heaters is carbon dioxide and water vapor which will inhibit drying. Thus, if these are the only methods available, proper air exchange is especially critical. The applicator should advise the general contractor in writing about the importance of proper ventilation. After the USG Levelrock or USG Durock™ pour has been completed, the responsibility for maintaining the proper drying environment rests with the general contractor.

### DRYING RATES

USG Levelrock and USG Durock™ self-leveling gypsum underlayments must be dry before installing floor covering. The exception to the drying times below is USG Durock™ Quik-Top™ White and USG Durock™ Quik-Top™ Gray gypsum underlayments. These products have a unique technology that allows for floor-covering just 15 hours after installation.

Normal drying time for 3/4 in. (19 mm) thickness is 5-7 days, with proper ventilation/good air flow (70 °F (21 °C), 50% relative humidity). Underlayment thickness and drying conditions will affect drying time; allow approximately 4-5 additional days for each additional 1/4 in. (6 mm) thickness. Also note that higher humidities and cooler temperatures – often found on jobsites – will inhibit drying.

As a general rule of thumb, USG Levelrock and USG Durock™ gypsum underlayments at their typical application rates will dry as follows:

- 1/2 in. (13 mm): 3-5 days
- 3/4 in. (19 mm): 5-7 days
- 1-1/2 in. (38 mm): 17-19 days

Drafts occurring during the setting process – usually within the first 2-3 hours after the pour can cause dusting on the surface of USG Levelrock and USG Durock™ gypsum underlayments due to the surface drying before it sets. However, once the material is set, air movement/air exchange is encouraged to speed the drying process.

### VARIABLE CIRCUMSTANCES

The normal drying times listed are under ideal conditions. As noted, underlayment thickness, higher humidities, lower temperatures and poor air flow will lengthen drying times.

Other situations that affect drying times are: leaks in roofs; lack of a permanent



## UNDERLAYMENT REQUIREMENTS

roof, windows or doors; and windows left open during storms which result in flooding of the floor—all of which have a potential negative effect on drying and product performance.

The standard recommendations regarding environmental conditions for USG Levelrock and USG Durock™ gypsum underlayments specifically state permanent windows, doors and a roof must be in place prior to the installation of USG Levelrock and USG Durock™ gypsum underlayments.\* Where jobsite conditions are not as specified, (windows get broken, doors left open or roofs leak), then any water covering a USG Levelrock or USG Durock™ gypsum underlayment should be removed as soon as possible. In most cases, a first wetting of a USG Levelrock or USG Durock™ gypsum underlayment will not affect the serviceability of the floor, assuming that it is allowed to dry properly. Repeated or continuous exposure to water however, can be detrimental. When in doubt, contact your USG/Alcorp Technical Representative. More importantly, after a flooding incident, recognize that the floor has now taken up more free water and therefore standard drying times no longer apply. Again, good air circulation and fresh air exchange are critical to helping the floor dry quickly.

**Note** \*USG Levelrock® CSD® Early Exposure™ floor underlayment is the exception to this rule.

### CHECKING FOR DRYNESS

Neither floor coverings nor any primer/sealers should be installed until it can be determined the USG Levelrock or USG Durock™ gypsum underlayment has dried. Likewise, non-breathable crack isolation membranes should not be installed until the underlayment is dry. The best way to determine this is by use of a Protimeter moisture meter ([protimeter.com](http://protimeter.com)). Two different models are acceptable for this purpose: the Surveymaster® and the Aquant®.

The entire floor should be surveyed to identify those spots which are taking longer to dry. Typically, a reading of 180 or less on the Protimeter moisture meter indicates less than 1% moisture content and suitable dryness of the floor. There can be slight variance between meters and that is why USG has supplied its USG Levelrock Authorized Applicators with standards to help calibrate the Protimeter moisture meter and determine where that “true dryness” level exists on a given instrument. USG has conducted an extensive investigation of various moisture meters and found the Protimeter to work the best for testing dryness of USG Levelrock and USG Durock™ gypsum underlayments. This meter uses radio frequency technology for checking dryness. There are various other meters that use probes and other types of technology, but none has provided results as consistent as the Protimeter.

Please strictly observe the manufacturer’s instructions regarding the proper operation, maintenance and calibration of all moisture meters.

Additional methods for checking for dryness include:

- Tape an 18 in. x 18 in. (457 mm x 457 mm) section of 6-mil vinyl plastic (as per ASTM D4263) to the surface of the underlayment and seal the edges.
- Lay a 24 in. x 24 in. (610 mm x 610 mm) high-density, smooth rubber mat on the underlayment surface and weigh down.

The underlayment is considered dry if there is no discoloration (darkening) of the underlayment or condensation on the test covering after 16 hours. Perform additional tests if necessary.

Perform tests in critical areas such as high underlayment thickness or in an area of poor air flow. More than one test may be necessary.

A worker in a yellow shirt and blue pants is applying a substance to a floor in a large industrial building. The worker is standing on a dark, possibly wet or freshly applied surface, and is using a tool to spread the material. The background shows the structural elements of the building, including steel beams and a high ceiling. The overall scene is dimly lit, with some light coming from the right side.

## FLOOR-COVERING PREPARATION

Properly preparing USG Levelrock and USG Durock™ self-leveling gypsum underlayment for floor-covering enhances not only the bond between underlayment and floor-covering adhesive, but can create smooth transitions and level floors. USG offers a professional line of primers and patches designed to work seamlessly with USG Levelrock and USG Durock™ self-leveling gypsum underlayments.

## FLOOR-COVERING PREPARATION

### PRIMING

Priming or sealing an underlayment is a vital step in achieving a strong bond between the underlayment and the floor-covering adhesive. USG Levelrock and USG Durock™ gypsum underlayments can be primed/sealed with USG Levelrock® All Purpose Sealer, USG Durock™ X2 Primer-Sealer or USG Durock™ Primer-Sealer. It is important to note that underlayment preparation may not be required when using high-solids urethane adhesives for wood floor attachment.\* However, insuring that the underlayment is completely dry prior to wood floor attachment is especially critical to avoid warping and swelling of the wood.

**Note** \*Follow floor-covering manufacturers' requirements for surface sealing. If the floor-covering or adhesive manufacturers' requirements are more stringent, their requirements take precedence.

### USG LEVELROCK ALL PURPOSE SEALER

USG Levelrock® All Purpose Sealer can be applied to most USG Levelrock and USG Durock™ gypsum underlayments prior to the application of floor-covering adhesives. USG Levelrock All Purpose Sealer can be applied by the floor covering mechanic or a USG Levelrock authorized applicator. The recommendations of the floor-covering and adhesive manufacturers will supersede those presented here.

USG Levelrock All Purpose Sealer is a concentrated formula and must be diluted prior to use. USG Levelrock All Purpose Sealer only requires a single coat application. Note – Do not use USG Levelrock All Purpose Sealer on the following products: USG Levelrock 4500, or USG Durock™ ProFlow, Quik-Top White, Quik-Top Gray, or Surface™ Pro self-leveling gypsum underlayments.

### INSTRUCTIONS FOR USG LEVELROCK AUTHORIZED APPLICATOR

USG Levelrock All Purpose Sealer can be applied to USG Levelrock and USG Durock™ gypsum underlayments by a USG Levelrock authorized applicator 2 hours after the underlayment has been installed; or as soon as the floor can be safely walked on.

At the jobsite, USG Levelrock All Purpose Sealer and the underlayment must be maintained between 50-95 °F (10-35 °C) for 48 hours before, during and after job completion. Radiant heat systems should be shut down and cooled off during application and drying of the sealer. Underlayment must be free of dirt, wax, polish, paint, excess dust or other contaminants before application of sealer. If the surface of the floor underlayment is excessively dusty, contact your USG/Alcorp Technical Representative for further instructions.

Spray-apply USG Levelrock All Purpose Sealer for best results. When spray-applying, a uniform application is critical. Voids may compromise the sealer performance and detrimentally affect adhesive bond. USG Levelrock All Purpose Sealer may also be broom- or roller-applied. Apply diluted sealer solution (1 part sealer to 4 parts water by volume) at a rate of 300 sq. ft./gal. (7.4 m<sup>2</sup>/L). Do not allow sealer to puddle, back-roll if necessary. For smaller areas, a roller may simplify application. USG Levelrock All Purpose Sealer is not a wear surface. See *USG Levelrock All Purpose Sealer Submittal* (IG1793) for further information.

### INSTRUCTIONS FOR FINISHED FLOOR GOODS CONTRACTOR

Check for porosity of the underlayment by sprinkling water onto the surface. If the water is quickly absorbed into the underlayment, primer may be required depending on the floor covering. If the water beads up no further sealing of the surface is recommended. However, in areas subject to extended trade traffic, the sealer may have worn off. Place a drop of water onto suspect areas. Rapid absorption of water

## FLOOR-COVERING PREPARATION

indicates a need for recoating in that area. USG Levelrock All Purpose Sealer can be applied to dry USG Levelrock or USG Durock™ gypsum underlayment. Determine underlayment dryness using a Protimeter moisture meter or use the plastic sheet method per ASTM D4263.

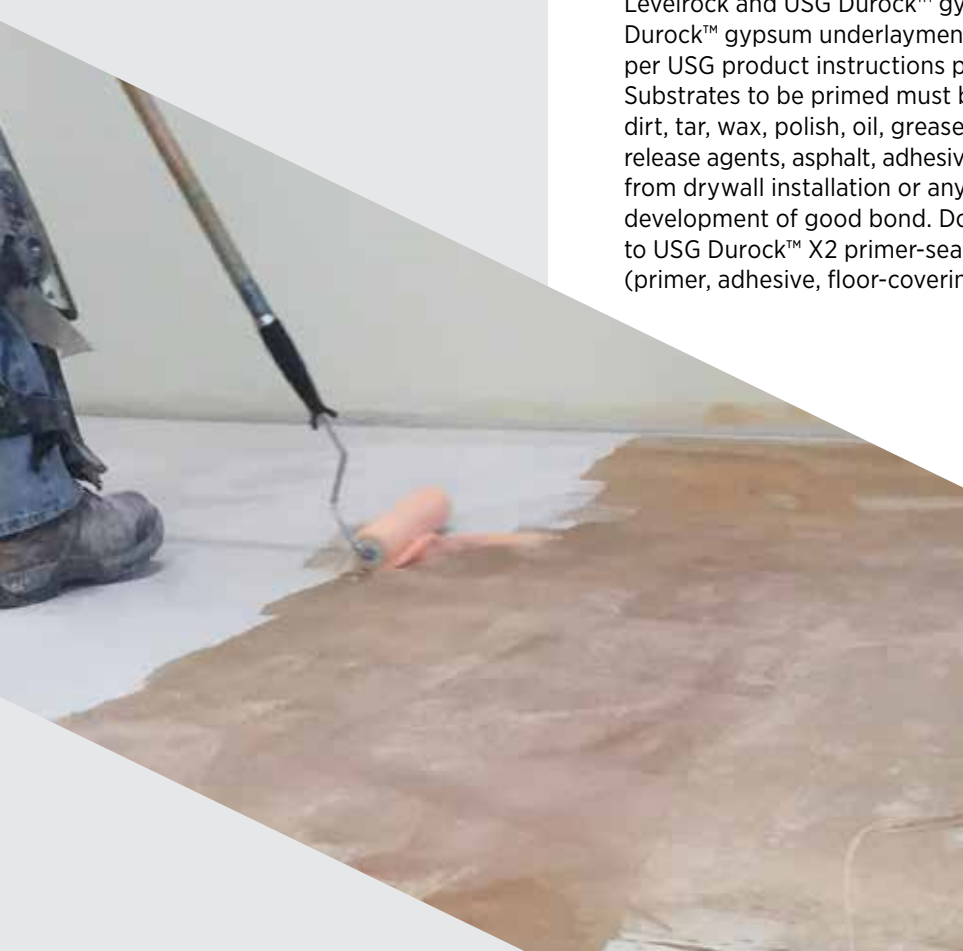
At the jobsite, USG Levelrock All Purpose Sealer and underlayment must be maintained between 50-95 °F (10-35 °C) for 48 hours before, during and after job completion. Radiant heat systems should be shut down and cooled off during application and drying of the Levelrock All Purpose Sealer. Underlayment must be free of dirt, wax, polish, paint, excess dust or other contaminants before application of USG Levelrock All Purpose Sealer. If the surface of the floor underlayment is excessively dusty, contact your USG/Alcorp Technical representative at 817 329.1808.

For best results, USG Levelrock All Purpose Sealer must be applied at least 2 hours prior to application of any adhesive overlays. In all cases, a field bond test must be conducted with the proposed adhesive to be used for the job to ensure compatibility.

Spray-apply USG Levelrock All Purpose Sealer for best results. When spray-applying, a uniform application is critical. Voids may compromise the sealer performance and detrimentally affect adhesive bond. USG Levelrock All Purpose Sealer may also be broom- or roller-applied. Apply diluted sealer solution (1 part sealer to 4 parts water by volume) at a rate of 300 sq. ft./gal. (7.4 m<sup>2</sup>/L). Do not allow sealer to puddle, back-roll if necessary. For smaller areas, a roller may simplify application. USG Levelrock All Purpose Sealer is not a wear surface. See *USG Levelrock All Purpose Sealer Submittal* (IG1793) for further information.

### **USG DUROCK™ X2 PRIMER-SEALER**

USG Durock™ X2 primer-sealer is a superior bond-enhancing sealer over USG Levelrock and USG Durock™ gypsum underlayments. All USG Levelrock and USG Durock™ gypsum underlayments must be properly installed and completely dried per USG product instructions prior to USG Durock™ X2 primer-sealer application. Substrates to be primed must be dry, structurally sound and clean. Remove any dirt, tar, wax, polish, oil, grease, latex compounds, sealers, curing compounds, release agents, asphalt, adhesives, paint, chemicals, loose topping, joint compounds from drywall installation or any other contaminant that might interfere with development of good bond. Do not use oil-based sweeping compounds. Prior to USG Durock™ X2 primer-sealer application, conduct a floor-covering system (primer, adhesive, floor-covering) field bond test.





## FLOOR-COVERING PREPARATION

The dew point, as it relates to interior moisture condensation, is an important factor for ensuring that proper conditions exist before and during substrate testing, preparations and floor-covering installations. The substrate temperature should be at least 5 °F (-15 °C) higher than the dew point. Note – The interior air temperature must be maintained between 65 °F and 95 °F (18 °C and 35 °C) and the Relative Humidity (RH) must be maintained between 45% and 65% RH. Monitoring the substrate temperature, indoor temperature and RH, and utilizing fans and/or dehumidifiers as needed will help correct or prevent existing or possible dew point conditions until the installation is complete. For primer-sealer application, the temperature of USG Durock™ X2 primer-sealer, the substrate and the room must be maintained between 65 °F and 95 °F (18 °C and 35 °C) for a period of 48 hours before, during and after job completion.

**Note** High air relative humidity and/or low substrate temperature may necessitate a longer drying time.

USG Durock™ X2 primer-sealer must be roller-applied. Do not spray-apply. Using a 3/8 in. (10 mm) nap roller, apply an even coat at a rate of 315-360 sq. ft./gal. (7.7-8.8 m<sup>2</sup>/L) over the entire substrate surface. Always keep the roller wet with primer-sealer. Only one coat is required. The actual coverage of the primer-sealer will depend upon the nature and porosity of the substrate. Allow USG Durock™ X2 primer-sealer to dry for a minimum of 4 hours, or until completely dry and hardened to the touch. Dry time is estimated to be 4 hours at 70 °F (21 °C) and 65% relative humidity. See *USG Durock™ X2 Primer-Sealer Submittal* (CB687) for further information.

### **USG DUROCK™ PRIMER-SEALER**

USG Durock™ Primer-Sealer is an effective sealer of USG gypsum underlayments prior to application of water-based floor-covering adhesives. Check for porosity of the underlayment by sprinkling water onto the surface. If the water is quickly absorbed into the underlayment, primer may be required depending on the type of floor covering. If the water beads up no further sealing of the surface is recommended. However, in areas subject to extended trade traffic, the sealer may have worn off. Place a drop of water onto suspect areas. Rapid absorption of water indicates a need for recoating in that area. USG Durock™ Primer-Sealer can be applied to most dry USG Levelrock or USG Durock™ gypsum underlayments. Determine underlayment dryness using a Protimeter moisture meter or use the plastic sheet method per ASTM D4263. Note – Do not use USG Durock™ Primer-Sealer on the following products: USG Levelrock 4500, or USG Durock™ ProFlow, Quik-Top White, Quik-Top Gray or Surface Pro self-leveling gypsum underlayments.

At the jobsite, USG Durock™ Primer-Sealer and underlayment must be maintained between 50-95 °F (10-35 °C) for 48 hours before, during and after job completion. Radiant heat systems should be shut down and cooled off during application and drying of the USG Durock™ Primer-Sealer. Underlayment must be free of dirt, wax, polish, paint, excess dust or other contaminants before application of the USG Durock™ Primer-Sealer. The use of oil-based sweeping compounds is not recommended. If the surface of the floor underlayment is excessively dusty, contact your USG/Alcorp Technical representative at 817 329.1808.

## FLOOR-COVERING PREPARATION

Apply fully diluted primer of one part USG Durock™ Primer-Sealer to four parts potable water at a rate of 400–450 sq. ft./gal (9.8–11.0 m<sup>2</sup>/L). The USG Durock™ Primer-Sealer dilution can be sprayed or applied with a paint roller to the underlayment surface. Do not allow USG Durock™ Primer-Sealer to puddle. Do not overseal USG Levelrock or USG Durock™ self-leveling underlayment. For best results, USG Durock™ Primer-Sealer sealer must be applied at least 3 hours prior to application of any adhesive overlays. Dry time will vary with drying conditions. In all cases, a field bond test must be conducted with the proposed adhesive to be used for the job to ensure compatibility. Recommendations of the floor-covering and floor-covering adhesive manufacturers supersede these instructions.

### PATCHING

If needed, the underlayment can be patched after priming is completed and dry. USG offers the following floor patches for use over USG Levelrock and USG Durock™ gypsum underlayment floors:

- USG Durock™ Advanced Skim Coat™ Floor Patch
- USG Durock™ X Floor Patch
- USG Durock™ NE™ Floor Patch
- USG Durock™ Quik-Ramp™ Floor Patch

Existing gypsum underlayment must be solid with no cracks and dust free. Gypsum underlayment must be sealed with USG Durock™ X2 Primer-Sealer, USG Levelrock™ All Purpose Sealer or USG Durock™ Primer-Sealer. First test surface hardness by scratching existing underlayment with a coin. If surface can be gouged, do not use floor patch and consult USG for alternative repair methods. For more information, see *USG Durock™ Advanced Skim Coat™ Floor Patch Submittal* (CB805), *USG Durock™ X Floor Patch Submittal* (CB816), *USG Durock™ NE™ Floor Patch Submittal* (CB674) and *USG Durock™ Quik-Ramp™ Floor Patch Submittal* (CB667).



## FLOOR-COVERING INSTALLATION

USG Levelrock and USG Durock™ self-leveling gypsum underlayments accept virtually every type of floor covering – from luxury vinyl and carpet to hardwood and natural stone tile. In addition, USG provides a 10-year limited system warranty when using a USG Levelrock or USG Durock™ self-leveling gypsum underlayment sealed with USG Durock™ X2 primer-sealer and a XL Brands® manufactured adhesive. For a successful finished floor, follow the specific installation recommendations (pages 12 – 15).

## FLOOR-COVERING INSTALLATION

### CARPET AND PAD

A variety of carpets, carpet pads, and adhesives can be used with USG Levelrock and USG Durock™ gypsum underlayments (see pages 18-19).

#### GLUE-DOWN ATTACHMENT

Follow *Underlayment Requirements* instructions to prepare the underlayment. Also, follow floor goods manufacturer's adhesive recommendations. Prior to installation, conduct a bond test to confirm compatibility.

**Carpet Modules.** Follow *Underlayment Requirements* instructions to prepare the underlayment. Install carpet modules with 100% adhesive coverage. A bond test should be conducted no sooner than 72 hours after the adhesive has been applied (cool temperatures and/or high humidity may lengthen this time). A successful bond test should have 90-100% of the adhesive remaining on the floor after the carpet tile has been pulled up.

#### MECHANICAL ATTACHMENT

Note – Mechanical attachment of tackless strips is not recommended when USG Levelrock or USG Durock™ gypsum underlayment has been poured over expanded or extruded polystyrene or a sound mat or on the edges of a corrugated deck steel installation. These situations will most likely result in cracking of the underlayment and/or failure of the nails to pierce the corrugated steel deck. (See *Adhesive Attachment Tackless Strips*.)

**Tackless Strips Over Wood Subfloors.** When USG Levelrock or USG Durock™ gypsum underlayment has been applied to a wood subfloor, use tackless strips such as those manufactured by Halex Corporation (halexcorp.com). For underlayments thicker than 3/4 in. (19 mm), install filler nails every 12 in. (305 mm) to 18 in. (457 mm) o.c. Filler nail should be long enough to penetrate at least 1/4 in. (6 mm) into the subfloor.

**Tackless Strips Over Concrete.** When USG Levelrock or USG Durock™ gypsum underlayment has been applied to a concrete subfloor:

- Install standard tackless strips with concrete nails every 18 in. (457 mm) to 24 in. (609 mm) o.c. Concrete nails should be long enough to penetrate at least 1/4 in. (6 mm) into the subfloor.
- Install diamond-point nails through the tackless strip and underlayment with an air compressor-driven automatic nailer.

**Carpet Tack Strips.** If a carpet tack strip is used, a 1-1/4 in. (32 mm) x 12 gauge spiral shank anchoring nail is recommended for USG Levelrock and USG Durock™ gypsum underlayments.

#### ADHESIVE ATTACHMENT

**Tackless Strips.** Follow the *Underlayment Requirements* instructions. To attach tackless strips to the underlayment, use PL 400 heavy duty construction adhesive from Loctite® or CX-948 polyurethane adhesive/sealant from Chemrex®. Before installing carpet, wait 24 hours after applying PL 400 adhesive; wait overnight after applying CX-948 adhesive/sealant. Apply CX-948 adhesive/sealant with a minimum 3/8 in. (10 mm) bead, which equates to 30 lineal ft. (9 m)/10 oz. (295.7 ml) tube, where the tackless strip will be placed. Do not install more than 30 ft. (9 m) of the product before applying the tackless strip.



## FLOOR-COVERING INSTALLATION

### LAMINATED HARDWOOD AND ENGINEERED WOOD FLOORING

Follow the *Underlayment Requirements* instructions to prepare the underlayment. Underlayment dryness is critical for wood floor coverings to avoid warping and swelling. Make sure all critical areas are tested for dryness using the Protimeter moisture meter. Follow wood floor-covering manufacturer's recommendations for maximum moisture levels.

#### MECHANICAL ATTACHMENT

Follow and adhere to floor goods manufacturer's general and installation recommendations.

#### FLOATING FLOORS

Follow and adhere to floor goods manufacturer's general and installation recommendations.

### SOLID WOOD FLOORING

Follow the *Underlayment Requirements* instructions to prepare the underlayment. Underlayment dryness is critical for wood floor coverings. Make sure all critical areas are tested for dryness using the Protimeter moisture meter. Follow wood floor-covering manufacturer's recommendations for maximum moisture levels.

#### MECHANICAL ATTACHMENT

Attach flooring based on installation recommendations from the National Wood Flooring Association (NWFA) and the National Oak Flooring Manufacturers Association, Inc. (NOFMA).



## FLOOR-COVERING INSTALLATION

### LUXURY VINYL, SHEET VINYL AND VINYL COMPOSITION TILES

Follow the *Underlayment Requirements* instructions to prepare the underlayment. As a general rule, prior to application of the vinyl, the moisture level on the floor should be less than 1%, as measured in a variety of locations throughout the underlayment surface using a Protimeter moisture meter. However, the vinyl floor manufacturer's recommendations will always supersede the recommendations provided here. Carefully follow and adhere to floor goods manufacturer's recommendations. Prior to installation, conduct a bond test to confirm compatibility.

### CERAMIC, QUARRY AND MARBLE TILE

When a sound reduction mat is present, USG recommends using a crack isolation membrane such as USG Durock™ Tile Membrane, or a product intended for this use and warranted by its manufacturer.

**Movement Joints.** Follow and adhere to expansion joint requirements found in the Handbook for Ceramic, Glass, and Stone Tile Installation under EJ171 specification. Contact the Tile Council of North America, Inc. (TCNA) at (864) 646-8453 or [tcnatile.com](http://tcnatile.com) for a copy of the handbook.

### DECORATIVE FLOORS

USG Levelrock UltraArmor, USG Durock™ Proflow™ and USG Durock™ Quik-Top™ White and Quik-Top™ Gray gypsum underlayments can be used as a decorative wear surface with an approved floor coating. When combined with a suitable coating system, these underlayments may be stained or used by themselves as a finished floor. It is the coatings manufacturer's responsibility to determine the correct product, system and surface preparation for use over these underlayments.

## FLOOR-COVERING INSTALLATION

### **RADIANT HEAT SYSTEMS**

Adhere to the *2010 RPA Guidelines for the Design and Installation of Radiant Panel Heating and Snow/Ice Melt Systems* regarding temperature and fluid temperatures. See [radiantprofessionalsalliance.org](http://radiantprofessionalsalliance.org). Fluid temperatures of radiant systems shall not exceed 140 °F (60 °C) at the exit of the heating device. To limit risk of injury, floor temperatures shall not exceed 110 °F (43 °C) in general and shall be limited to 85 °F (29 °C) in areas of direct contact by building occupants. Start up of radiant systems shall be in accordance with manufacturers' and RPA recommended start-up procedures. To minimize any potential of shocking the USG Levelrock radiant heat flooring product, the radiant heat system should be ramped up slowly over several days until the underlayment is fully dry. However, the radiant heat system manufacturer's recommendations for startup procedure will take precedence. The temperature of the radiant heat system should be lowered when applying any adhesive and floor covering. Allow thin-set mortar to cure at least 7 days before turning on hydronic or electric heating systems to allow the material to hydrate adequately.

### **CARPET AND PAD**

Select a tackless system and install. Achieve appropriate heat transfer by using a low-R-value carpet cushion. Be careful not to puncture radiant heating tubes with tack nails when mechanically installing the tackless strip. An adhesive attachment of tackless strip is preferred.

### **LAMINATED HARDWOOD AND ENGINEERED WOOD FLOORING**

These flooring systems are ideal with radiant heat systems. The systems are very stable and resist expansion and contraction while improving the overall performance of radiant systems.

During adhesive and floor installation, lower the temperature of the radiant heat system. Higher temperatures may adversely affect the working properties of the adhesive. Follow and adhere to floor goods manufacturer's adhesive recommendations.

### **SOLID WOOD FLOORING**

Use a nail-down sleeper system. Install tubing between 2 x 4 sleepers, which are attached to the subfloor. Pour USG Levelrock® RH or USG Levelrock® Commercial RH gypsum underlayment between the spaces around the tubes to provide thermal mass. Underlayment must be 3/4-in. (19 mm) minimum above the top of the radiant heating tubes. When floor underlayment is completely dry, install a vapor barrier, and nail boards to the nailing sleepers. Be careful not to puncture the radiant heating tubes when nailing down solid wood floor. This system offers limited insulation above the radiant system. For best results, refer to the radiant heat system manufacturer's recommendations.

**Note** The floor surface temperature should never exceed 85 °F (29 °C) when laminated, parquet or solid wood floors are installed over radiant systems.

### **LUXURY VINYL, SHEET VINYL AND VINYL COMPOSITION TILES**

According to vinyl industry recommendations, the floor surface temperature should never exceed 85 °F (29 °C). During adhesive and tile installation, lower the floor temperature. Working time and open time of adhesive can be affected by floor temperature.

## WARRANTIES

### **USG/XL BRANDS® STRONGER THAN CONCRETE™ FLOOR SYSTEMS 10-YEAR LIMITED SYSTEM WARRANTY**

**USG** (usg.com) provides a 10-year limited system warranty when using a USG Levelrock or USG Durock™ gypsum underlayment sealed with USG Durock™ X2 primer-sealer and in conjunction with an XL Brands manufactured adhesive. When used in a non-system application, USG Levelrock and USG Durock™ gypsum underlayments and USG Durock™ X2 primer-sealer have a two-year limited warranty. Contact USG for further details.

### **USG DUROCK™ ADVANCED SKIM COAT™ FLOOR PATCH IN CONJUNCTION WITH XL BRANDS® ADHESIVES 10-YEAR LIMITED WARRANTY**

**USG** (usg.com) provides a 10-year limited warranty on USG Durock™ Advanced Skim Coat Floor Patch when used in conjunction with an XL Brands® manufactured adhesive. When used without an XL Brands manufactured adhesive, USG Durock™ Advanced Skim Coat Floor Patch has a 2-year limited warranty. Contact USG for further details.

### **LAYERED WARRANTIES**

The following manufacturers provide warranties on their products when used as specified in conjunction with USG Levelrock products. For further details, contact the product manufacturer or your USG/Alcorp Technical Representative.

**Custom Building Products** (custombuildingproducts.com)  
**Merkrete** (merkrete.com), a division of Parex USA Inc.

## REFERENCES

USG Levelrock and USG Durock™ gypsum underlayments are compatible with a variety of ancillary products that complete the installation of finished floors. The following pages include references for crack isolation and waterproof membranes, thin-sets, adhesives and floor coverings.

For more information about **USG Levelrock and USG Durock™ gypsum underlayments**, visit **usg.com**, **pourlevelrock.com** or contact your USG/Alcorp Technical representative at **817 329.1808**.

**Note** On pages 17 – 19, all \* and ™ are trademarks of the corresponding manufacturers/companies.



## CRACK ISOLATION AND WATERPROOF MEMBRANE AND THIN-SET MANUFACTURERS

Manufacturer	Product	Phone Number/Web Site
<b>Amorim Cork Composites</b>	AcoustiCORK® R12 crack suppression membrane	800-558-3206 acousticorkusa.com
<b>Bostik Smart Adhesives</b>	Hydroment® Ultra-Set Advanced waterproofing/crack/sound isolation membrane and setting adhesive	800-726-7845 bostik-us.com
<b>C-Cure</b>	UniFlex® 916 elastomeric dry-set mortar and anti-fracture membrane, Pro-Red® waterproofing membrane 963, UltraCure® 971 elastomeric waterproofing and anti-fracture membrane	800-895-2874 c-cure.com
<b>Compotite Corporation</b>	Composeal Gold crack isolation waterproof membrane	800-221-1056 compotite.com
<b>Custom Building Products</b>	FlexBond® crack prevention mortar, MegaFlex® crack prevention mortar, RedGuard® waterproofing and crack prevention membrane	800-272-8786 custombuildingproducts.com
<b>Flex-Guard Products, Inc.</b>	Flex-Guard® crack isolation system	800-279-7600 flexguardproducts.com
<b>Flextile Ltd.</b>	WP-980 waterproof and crack isolation membrane	800-699-3623 flextile.net
<b>Laticrete International, Inc.</b>	Laticrete® 9235 waterproofing membrane, Laticrete® 254 Platinum thin-set, Laticrete® Hydro Ban™	203-393-0010 800-243-4788 laticrete.com
<b>Mapei Corporation</b>	Mapelastic™ AquaDefense, Mapelastic™ HPG waterproofing membrane, Kerabond™/Keralastic™ system premium flexible tile mortar, Granirapid® system premium, rapid-setting, flexible, polymer-modified mortar system Ultraflex™ 1 standard tile mortar with polymer, Ultraflex™ 2 professional tile mortar with polymer, Ultraflex™ 3 premium tile mortar with polymer, Ultracontact™ premium, full contact tile mortar with polymer, Ultracontact™ RS ultra-premium, rapid-setting, full-contact mortar, Mapelastic™ 315 flexible cement-based waterproofing membrane, Planicrete® W flexible setting compound	800-992-6273 mapei.us
<b>Parex USA, Inc.</b>	Merkrete Hydro Guard 2000 interior and exterior waterproof and crack isolation membrane, Merkrete Hydro Guard SP-1 elastomeric waterproofing/antifracture membrane, Merkrete Hydro Guard 1 elastomeric waterproofing/antifracture membrane, Merkrete Fracture Guard 5000 crack isolation mold resistant membrane	800-226-2424 parexusa.com
<b>Noble Company</b>	NobleSeal® TS thin-set waterproofing membrane	800-878-5788 noblecompany.com
<b>Proflex Products Inc.</b>	PROFLEX™ 40 CISM crack isolation sound membrane, PROFLEX™ 70 SSC super sound control membrane, PROFLEX™ 90 MSC mega-sound control membrane, PROFLEX™ Hydra-Seal waterproofing and crack isolation membrane, PROFLEX™ 95-KIT waterproofing and crack isolation membrane, PROFLEX™ CISM-KIT crack isolation repair kit, PROFLEX™ PRO-STICK 35 mastic	863-937-9623 proflex.us
<b>ProSpec</b>	ProSpec® Flex-Guard crack isolation system, ProSpec® Speed-Flex crack isolation system	800-832-9023 prospec.com
<b>Schluter Systems</b>	Schluter®-DITRA mat	888-472-4588 schluter.com
<b>SGM, Inc.</b>	Southcrete™ 1132 anti-fracture and waterproofing membrane	800-641-9247 sgm.cc
<b>Spectrum Mfg. Corp</b>	Spectrum Super-Flex anti-fracture membrane	623-434-0097 specmfgcorp.com
<b>TEC Specialty Products</b>	IFlex® crack isolation mortar over approved USG Levelrock® sealer	800-832-9023 tecspecialty.com
<b>USG</b>	USG Durock™ Brand tile membrane	800-USG-4YOU (874-4968) usg.com

**Note** For non-USG product recommendations, contact the manufacturer. USG does not guarantee the performance of any non-USG product; contact the manufacturers listed for information about their warranties and the most up-to-date product information.

## WARRANTED ADHESIVE MANUFACTURER

USG Levelrock and USG Durock™ self-leveling gypsum underlayments sealed with USG Durock™ X2 Primer-Sealer have been tested for compatibility with XL Brands manufactured adhesives and are warranted for 10 years in a system application. For further warranty information, see page 16 or contact your USG/Alcorp Technical Representative.

Manufacturer	Floor Covering Type	Adhesive Product	Phone Number/Web Site
<b>XL Brands, LLC</b>	Carpet, jute back	Carpet, Multi-purpose Adhesives	800-FOR-GLUE (367-4583) xlbrands.com
	Carpet, rubber back	Carpet, Multi-purpose Adhesives	
	Carpet, action back (latex & polyurethanes)	Carpet Adhesive	
	Carpet, unitary (latex & polyurethanes)	Carpet Adhesive	
	Carpet, hot melt	Carpet Adhesive	
	Carpet, double stick-pad to subfloor	Pressure Sensitive Adhesive (releasable)	
	Carpet, double stick-pad to subfloor	Carpet, Multi-purpose Adhesives (permanent)	
	Carpet tiles - PVC and polyurethane cushion back	Modular Carpet Tile PSA	
	Resilient tile, solid & laminated vinyl	Resilient Adhesives	
	Resilient tile, VCT	Resilient Adhesives	
	Sheet goods, mineral & synthetic felt	Resilient, multi-purpose Adhesives	
	Sheet goods, vinyl backed, full spread only	Resilient Adhesives	
	Wood flooring	Wood Flooring Adhesives	

## FLOOR COVERING AND ADHESIVE MANUFACTURERS

Manufacturer	Floor Covering	Adhesive Product	Phone Number/Web Site
<b>Armstrong</b>	Residential vinyl, felt backed	S-235, S-254	888-276-7876 armstrong.com  * Medintech is used in hospitals and should only be installed over the following USG Levelrock® gypsum underlayments: 3500, 4500 NXG®, Commercial RH, CSD® Early Exposure™ and USG Durock™ Proflow™ gypsum underlayment.
	Commercial vinyl back - Medintech*	S-580, S-599	
	Safeguard	S-599	
	Safeguard Spa	S-599, S-230, S-580	
	VCT tile	S-89, S-515, S-700, S-750	
	Vinyl tile, no-wax (dry back)	S-750	
	Urethane tile, no-wax (dry back)	S-89, S-700, S-750	
Commercial felt back vinyl - Commission Plus	S-235		

**Note** For non-USG product recommendations, contact the manufacturer. USG does not guarantee the performance of any non-USG product; contact the manufacturers listed for information about their warranties and the most up-to-date product information.

## FLOOR COVERING AND ADHESIVE MANUFACTURERS

Manufacturer	Floor Covering	Adhesive Product	Phone Number/Web Site
<b>Bostik Smart Adhesives</b>	Carpet, jute back	D-910™, D-850™, D-905™	800-726-7845 bostik-us.com
	Carpet, rubber back	D-1400™, D-1500™	
	Carpet, action back (latex & polyurethanes)	D-920™	
	Carpet, unitary (latex & polyurethanes)	D-920, D-670™	
	Carpet, hot melt	D-920, D-990™, D-910 and D-850	
	Carpet, double stick-pad to subfloor	D-870™ (pressure sensitive)	
	Carpet, double stick-pad to subfloor	D-870, D-850, D-807™ (permanent)	
	Carpet tiles – PVC and polyurethane cushion back	D-870 (pressure sensitive)	
	Resilient tile, solid & laminated vinyl	D-640™, D-650™	
	Resilient tile, VCT	D-640, D-650	
	Sheet goods, mineral & synthetic felt	D-670	
	Sheet goods, vinyl backed, full spread only	D-640	
	Wood flooring	Bostik's BEST®	
<b>Congoleum</b>	VCT, dry back DIY vinyl	AD42	800-274-3266 congoleum.com
	Forum wood plank	AD72	
	White Shield felt back	3044 premium flooring	
	DuraCeramic	DuraSet DS 100	
	DuraStone	DuraSet DS 100	
	DuraPlank	DuraSet DS 100	
<b>Forbo Flooring Systems</b>	Marmoleum®	414 Euroflex Lino Plus, 514 Eurosafe Lino Plus, 614 Eurostar Lino Plus, 615 Eurostar Lino EL, 650 Eurostar Fastcol	800-842-7839 forboflooringna.com
<b>Mannington</b>	Commercial bio-spec, vinyl blocked	V-82 (porous), V-95 (non-porous)	800-241-2262 mannington.com
	Commercial VCT	V-11	
	Residential felt backed vinyl	V-31	
	Vinyl tile and plank	V-68	
<b>Nora Systems, Inc.</b>	Rubber flooring	Nora® 310 polyurethane adhesive, Nora® 410 water-based acrylic adhesive	800-332-NORA nora.com
<b>W.F. Taylor Co., Inc.</b>	Carpet and pad, polypropylene, latex foam, rubber-back	2055, 2056, 2057, 2060, 2070, 2072, 2080, 2082, 2085, 2089, 2100	800-868-4583 (east coast) 800-397-4583 (west coast) wftaylor.com
	Carpet and pad, urethane foam, hot melts, latex, unitary needle, punched (indoor only)	2055, 2056, 2081	
	Carpet tiles	2027, 2903	
	Felt back vinyl, mineral back sheet vinyl	2037, 2087	
	VCT	2033, 2083	
	Vinyl & rubber	2090, 2091, 501	
	Engineered laminated plank and parquet wood	2021, 2091	
	Solid plank	Meta-tec® MS Plus Advance™ wood flooring adhesive	
<b>W.W. Henry Company</b>	Felt back vinyl	356C, 660, 256	800-232-4832 wwhenry.com
	Linoleum	482, 582	
	Commercial carpet	356C, 176, 451, 351, 256, 391	
	VCT	640, 660, 430, 530, 130, 420	
	Vinyl back sheet goods	640, 650, 422	
	Rubber tile	412	
	Engineered wood	971, 1171N	

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## CONTACT INFORMATION

United States Gypsum Company  
550 West Adams Street  
Chicago, IL 60661

## TECHNICAL SERVICE

800 USG.4YOU

## WEB SITES

usg.com  
pourlevelrock.com  
usgdesignstudio.com

## LITERATURE

888 874.2450

## SAMPLES

817 329.1808

## CUSTOMER SERVICE

800 621.9523

## PRODUCT INFORMATION

See usg.com and 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.

## TRADEMARKS

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## SAFETY FIRST!

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