



USG DUROCK™ BRAND SURFACE™ SURFACE™ FR SELF-LEVELING UNDERLAYMENT

Premium engineered cementitious underlayments

- Innovative, self-sealing technology
- Fast application, fast-setting allows for return of light trade traffic within hours
- High compressive strength—stands up to commercial and institutional use
- Ideal for renovating concrete subfloors—can be applied at various thicknesses
- Can be applied to concrete surfaces without requiring mechanical profiling
- UL Classified and specified for use in 130+ assemblies
- May assist in obtaining LEED® credits

USG Durock™ Surface™ FR Self-Leveling Underlayment

- Provides improved impact resistance
- Enhances crack reduction and reduces further propagation
- Cost-effective reinforcement solution with improved load distribution

DESCRIPTION

USG Durock™ Brand Surface™ and Surface™ FR Self-Leveling Underlayments are pre-sanded engineered cementitious underlayments designed by USG for interior use in commercial, institutional and rehab construction. USG Durock™ Surface and Surface FR Self-Leveling Underlayments provide a smooth, hard underlayment surface over concrete slabs, pre-stressed concrete and concrete planks at thicknesses up to 3 in. (76 mm). Suitable for a variety of floor coverings, USG Durock™ Surface and Surface FR engineered cementitious underlayments exceed commercial vinyl floor-covering requirements as a high-performance underlayment with compressive strengths ranging from 4,500 to 5,500 psi (31.0 to 37.9 MPa).

USG Durock™ Surface™ FR Self-Leveling Underlayment is reinforced with fibers that improve impact strength. It is a cost-effective solution for interior use in commercial, institutional and rehab construction.

Quick set times and high production rates allow for traffic within hours of installation. The exceptional surface hardness of USG Durock™ Surface and Surface FR Self-Leveling Underlayments resist indentation from trade traffic. USG Durock™ Surface and Surface FR Self-Leveling Underlayments feature an innovative self-sealing technology that typically permits the floor covering to be installed without the need to seal the underlayment—minimizing installation cost and time. Once USG Durock™ Surface and Surface FR Self-Leveling Underlayments are dry, most floor coverings may be applied directly to the underlayment surface.¹

USG Durock™ Surface engineered cementitious underlayments are mixed with water at the job site to yield a lightweight underlayment with a smooth and monolithic surface. A 1/2 in. (13 mm) thick underlayment weighs approximately 5 lbs./sq. ft. (2.3 kg/24.4 m²) and has an approximate dry density range of 123-130 lbs./cu. ft. (1,970-2,082 kg/m³).

USG 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 Durock™ Surface and Surface FR Self-Leveling 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.

Note

1. Floor manufacturers' recommendations may supercede those presented here—especially with respect to the requirement for sealing underlayment. In all cases, a field bond test using the floor-covering adhesive is recommended.

VOC EMISSIONS

USG Durock™ Surface™ and Surface™ FR Self-Leveling Underlayments achieved GREENGUARD Gold Certification and qualify as a “Low Emitting” material per California Department of Public Health CDPH/EHLB/Standard Method (CA Section 01350) for school classroom, single-family residence and private office modeling scenarios, and meets USGBC’s LEED® v4 emission requirements.



EXTENDED WARRANTY

An extended warranty may apply when using USG Durock™ Surface and Surface FR Self-Leveling Underlayments in a system application. Please contact USG for further details.

SUBFLOOR PREPARATION

All subfloors must be structurally sound, stable and solid. If there is any question about the structural soundness of the subfloor, consult with the engineer on the project or request the services of a professional structural engineer. Shot blasting is not required in most situations.

Subfloors must be clean and free of dirt, tar, wax, oil, grease, latex compounds, sealers, curing compounds, release agents, asphalt, water-soluble adhesives, paint, chemicals, loose old cementitious products, joint compounds from drywall installation or any other contaminant that might prevent proper bonding of the underlayment to concrete. Seal off floor drains before starting to pour underlayment to prevent drain pipes from clogging.

A weak or degraded concrete surface layer must be removed mechanically to provide a solid base. To decide whether mechanical preparation of substrate is required or not, the concrete substrate must be thoroughly assessed for its quality over the entire pour area. Simple visual appearance of concrete substrate as strong and solid does not necessarily guarantee that the concrete substrate is free of impurities and has the right tensile strength.

Concrete exhibiting signs of laitance (a layer of weak material on the concrete surface either visible or invisible), scaling, spalling, crumbling or delamination must be mechanically removed to achieve a solid and clean substrate. Prior to installation of the underlayment, remove weak or degraded concrete (as described above) with hammer, chisel or other simple means. It is not required to mechanically profile the concrete subfloor with methods such as shot blasting, scarifying or diamond grinding.

Concrete subfloors receiving cementitious underlayment systems must be cured properly (generally for a minimum of 28 days) prior to underlayment installation. Subfloor Moisture Vapor Emission Rate (MVER) exceeding 5 lbs. (2.3 kg)/1000 sq. ft. (92.9 m²)/24 hours per ASTM F1869 or a relative humidity (RH) greater than 80% per ASTM F2170 must be treated with USG Durock™ RH-100™ Moisture Vapor Reducer. USG Durock™ Surface and Surface FR Self-Leveling Underlayments are not a vapor barrier. Transmission of excessive moisture vapors from the concrete subfloor through USG Durock™ Surface and Surface FR Self-Leveling Underlayments can interfere with floor-covering adhesives and compromise their performance. If sand broadcasting is not required during the installation of the moisture mitigation system, the surface must be primed with USG Durock™ Primer-Sealer prior to application of USG Durock™ Self-Leveling Underlayments. Contact USG Technical Service 800 874-4968 for further information regarding suitable moisture mitigation products and systems for use with USG Durock™ Surface and Surface FR Self-Leveling Underlayments.

To minimize the effect of expansion and cracking, wrap USG Levelrock Perimeter Isolation Strip 2.5 (1/4 in. (6 mm) thick) around all door jambs, columns and pipes. For outside corners, the strip should extend a minimum of 24 in. (610 mm) from the corner on both sides. For more information on perimeter isolation strip installation, see *USG Levelrock® Brand Perimeter Isolation Strip Submittal* (IG1874).

Fill deep areas and holes prior to final application. Contact USG for further information.

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 Durock™ Surface and Surface FR Self-Leveling Underlayments. Consult with the engineer on the project or request the services of a professional structural engineer for all suspected structural cracks.

SUBFLOOR PREPARATION CONT.

Repair all non-structural cracks in old and new concrete to minimize and control their ability to telegraph through the layer of USG Durock™ Surface and Surface FR Self-Leveling Underlayments. First remove the weak concrete along the length of the cracks by chiseling or other suitable means. Next, remove accumulated dust and debris from the crack cavities using a HEPA filtration industrial 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 Durock™ Surface and Surface FR Self-Leveling Underlayments. Growth of existing cracks or formation of new cracks in the concrete subfloor can lead to cracks telegraphing through USG Durock™ Surface and Surface FR Self-Leveling Underlayments. Respect existing expansion and control joints (see *Notes/Limitations* #6, pg. 5).

USG Durock™ Surface and Surface FR Self-Leveling Underlayments can be installed over non-water-soluble adhesives on concrete only. The adhesive residue must first be tested to make certain it is non-water-soluble. Any water-soluble adhesive residues must be mechanically removed down to clean concrete. Non-water-soluble adhesive residues should be prepared to a thin, well-bonded residue using the “wet-scraping” technique as recommended by the Resilient Floor Covering Institute (rfci.com) to remove thick areas and adhesive buildup, as well as any areas that are weak or not well bonded to the concrete. Any existing patches below the adhesive must be completely removed.

USG Durock™ Surface and Surface FR Self-Leveling Underlayments will set within two hours under normal conditions. Light foot traffic can occur after this time; normal trade traffic can resume the next day.

After USG Durock™ Surface or Surface FR Self-Leveling Underlayment is firmly set (typically two hours after the pour), provide adequate ventilation to ensure uniform drying of the installed USG Durock™ Surface or Surface FR Self-Leveling Underlayment. High ambient humidity and higher thicknesses will delay the drying process. Protect floors from heavy trade traffic loads (i.e., loaded drywall carts, heavy tool cabinets, etc.) with plywood.

TOOLS

- Mixing drum (15 gallons)
- Gage rake
- Smoother/spreader
- Nonmetallic cleated shoes
- Measuring bucket
- Mixing drill type 2 through 7—as outlined in the Technical Guidelines, prepared by the International Concrete Repair Institute, *Pictorial Atlas of Concrete Repair Material Mixing Equipment* (Guideline No. 320.5R-2014)
- Mixing paddle type 2, 3, 4, 8 or 9—as outlined in the Technical Guidelines, prepared by the International Concrete Repair Institute, *Pictorial Atlas of Concrete Repair Material Mixing Equipment* (Guideline No. 320.5R-2014)
- 2 in. x 4 in. (51 mm x 102 mm) brass or plastic cylinder
- 12 in. x 12 in. x 1/4 in. (305 mm x 305 mm x 6 mm) Plexiglas® sheet
- Minimum 2 in. (51 mm) putty/drywall taping knife
- Ruler or tape measure

PRIMING

Use USG Durock™ Primer-Sealer for preparing the concrete prior to application of USG Durock™ Surface and Surface FR Self-Leveling Underlayments. Proper use of USG Durock™ Primer-Sealer enhances the bond of the underlayment and effectively seals the subfloor and prevents formation of pinholes, domes and craters in USG Durock™ Surface and Surface FR Self-Leveling Underlayments due to the upward migration of air bubbles from the subfloor. Refer to submittal sheet *USG Durock™ Brand Primer-Sealer* (CB519) at usgperformanceflooring.com for installation instructions and application rates.

Floors to be primed must be dry, structurally sound and clean. Remove any dirt, tar, wax, oil, grease, latex compounds, sealers, curing compounds, release agents, asphalt, water-soluble adhesives, paint, chemicals, loose topping, joint compounds from drywall installation or any other contaminant that might interfere with development of good bond.

For primer application, the temperature of the USG Durock™ Primer-Sealer, subfloor and room must be maintained between 50 °F and 95 °F (10 °C and 35 °C) for a period of 48 hours before and after application.

CONTINUOUS MIXER AND PUMP

BARREL MIXING

Contact USG to determine the appropriate mixing equipment required.

When opening bags and mixing, use engineering controls, including local exhaust, to reduce exposure to dust. Wear NIOSH-recommended respirator if needed. It is important that the mixing water for the total number of bags to be mixed is in the barrel prior to adding the dry material.

Determine the number of bags needed. Add 3.5 – 4.5 quarts (3.3 – 4.3 liters) of cool, clean potable water for each 50 lb. (22.7 kg) bag of USG Durock™ Surface or Surface FR Self-Leveling Underlayment powder to the dry mixing barrel. Next, slowly add one bag to the barrel while mixing. Mix for 30 seconds, making sure that all material is wetted out thoroughly. Slowly add the second and any additional bags to the mixing barrel while continuing to mix. Make sure the barrel sides are thoroughly scraped free of dry powder and that there is no unmixed material on the bottom of the barrel. Mix for an additional 90 seconds and ensure the material is uniform and lump free.

Perform a slump test on the material before application. See *Test Procedures* for instructions.

Do not add additional water until the two-minute mixing cycle has been completed. Do not overwater the material. If additional water is required, add no more than 0.4 quarts per bag and mix for 30 seconds or until mix is uniform. Do not overmix (more than three minutes), as this may induce air into the material.

The presence of bleed water on the surface and/or material segregation (settling of sand) indicates overwatering. Adjust the amount of water added to the mix to prevent bleed water and material segregation.

TEST PROCEDURES

SLUMP TEST

Set Plexiglas® sheet on a level, stable surface, away from foot traffic. Ensure that the 2 in. X 4 in. (51 mm X 102 mm) cylinder is clean and dry. Place the cylinder in the middle of the Plexiglas sheet. Pour the USG Durock™ Surface or Surface FR Self-Leveling Underlayment slurry into the cylinder, slightly overfilling it. Screed off the excess material from the top of the poured cylinder away from the Plexiglas sheet. Lift the cylinder up smoothly to form the patty. Do not shake any excess slurry from the cylinder. Wait one minute and measure the patty in two directions 90° apart and calculate the average of the two measurements +/- 1/8 in. (3 mm). Ensure that the average patty diameter is within the 9-1/2 in. to 11 in. (241 mm to 279 mm) range.

APPLICATION

During the entire installation process, the building must be enclosed and temperature maintained at a minimum of 50 °F (10 °C) minimum until permanent heating is available. Adequate ventilation must be provided to ensure uniform drying of the installed floor underlayment, which typically occurs within 3–5 days at a 1/2-in. (13 mm) thickness.

During application and until the USG Durock™ Surface or Surface FR Self-Leveling Underlayment is firmly set (typically the first two hours immediately following the pour), close all doors, windows and other openings in the building and turn off HVAC systems to prevent air drafts. Protect installation areas from direct sunlight exposure for at least 24 hours. Thereafter, normal operation of the HVAC system can resume, as well as the use of doors, windows and other openings.

USG Durock™ Surface and Surface FR Self-Leveling Underlayment—either mixed or in powdered form—subfloor and room temperature must be between 50 °F and 95 °F (10 °C and 35 °C) at the time of application and for 72 hours after installation of USG Durock™ Surface or Surface FR Self-Leveling Underlayment. For temperatures above 95 °F (35 °C), follow the American Concrete Institute's (ACI) *Hot Weather Concrete Guidelines* to ensure proper installation. If available water is not cool, chill water to 70 °F (21 °C).

When uncertain or unknown construction conditions are present on the job site, it is recommended to pour a small test area before conducting full installation. The test area must also include finish flooring to establish suitability of the complete system for intended use.

USG Durock™ Surface and Surface FR Self-Leveling Underlayments have a flow time of approximately 15 minutes at 70 °F (21 °C). At higher temperatures the flow time is shortened; at lower temperatures the flow time is extended. Work as a team to obtain a satisfactory installation. Ensure continuous flow of slurry and promptly spread the USG Durock™ Surface or Surface FR Self-Leveling Underlayment to desired thickness and finish using a gage rake and a smoother. Perform these operations promptly to avoid trapping air bubbles, prevent formation of cold joints and achieve a satisfactory finish surface.

APPLICATION CONT.

Apply USG Durock™ Surface or Surface FR Self-Leveling Underlayment in an even ribbon along the short dimension of the room or area to be poured. Maintain a continuous wet edge. If pouring USG Durock™ Surface or Surface FR Self-Leveling Underlayment against an edge that has been allowed to set, the edge of the previous pour should be treated with USG Durock™ Primer-Sealer.

The average minimum thickness of USG Durock™ Surface and Surface FR Self-Leveling Underlayment over a concrete subfloor is 1/4 inch (6 mm). Small, confined areas and transitions can be feathered.

For priming recommendations prior to floor-covering application, check with the floor-covering manufacturer. If a floor-covering manufacturer's sealer is used, a bond test for compatibility should be conducted. When installing high-solids floor-covering adhesives, we do not recommend priming the surface.

FLOOR-COVERING INSTALLATION

- USG Durock™ Surface and Surface FR Self-Leveling Underlayments can be walked on two hours after installation.
- Floor coverings can be installed after the USG Durock™ Surface and Surface FR Self-Leveling Underlayment is dry. Drying time will vary depending on underlayment thickness and ambient climate conditions.
- Check with floor-covering and adhesive manufacturers for installation guidelines and suitability of their manufactured products over USG Durock™ Surface and Surface FR Self-Leveling Underlayments.
- Perform field bond test to determine adhesive/flooring performance over USG Durock™ Surface and Surface FR Self-Leveling Underlayments. Install floor covering with adhesive and perform field bond test approximately 72 hours after installation.
- Follow floor-covering manufacturers' recommendations for surface-sealing requirements. If the floor-covering or adhesive manufacturer requirements are more stringent, their requirements take precedence.

For further details on installation requirements, specifications and the most up-to-date product information, please see usgperformanceflooring.com.

NOTES/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 on wood subfloors.
5. For below-grade applications, contact USG.
6. 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.
7. Structure shall be designed so 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.
8. When the MVER exceeds 5 lbs. (2.3 kg)/1,000 sq. ft. (92.9 m²)/24 hours or an RH greater than 80% per ASTM F2170, treat the concrete subfloor with USG Durock™ RH-100 Moisture Vapor Reducer. USG Durock™ Surface and Surface FR Self-Leveling Underlayments are not a vapor or moisture barrier. Transmission of excessive water vapor or moisture from the concrete subfloor through the USG Durock™ Surface and Surface FR Self-Leveling Underlayments can interfere with floor-covering adhesives and compromise their performance. For on-grade applications, use USG Durock™ RH-100 Moisture Vapor Reducer over concrete. Moisture mitigation system may not be needed if a vapor retarder is installed below the concrete slab in accordance to industry specifications and practice (ASTM E1745, ASTM E1993, ASTM E1693) and the MVER value of the concrete slab is below 5 lbs. (2.3 kg)/1,000 sq. ft. (92.9 m²)/24 hours or has an RH less than 80% per ASTM F2170.
9. Existing cracks in the new and old concrete must be repaired with an appropriate crack repair material in accordance with industry recommendations prior to installation of the underlayment. Note that repair of existing cracks in the concrete subfloor only subdues but does not completely prevent their ability to telegraph through USG Durock™ Surface and Surface FR Self-Leveling Underlayments. Growth of existing cracks or formation of new cracks in the concrete subfloor can lead to cracks telegraphing through the poured underlayment.

PRODUCT DATA

USG Durock™ Surface and Surface FR Self-Leveling Underlayments are sanded at the factory. Job site addition of sand is not recommended and will void the warranty. USG Durock™ Surface and Surface FR Self-Leveling Underlayments are mixed with water to yield a self-leveling slurry.

Mixing Ratio: 3.5 – 4.5 quarts (3.3 – 4.3 liters) of water per 50 lb. (22.7 kg) bag

Approximate Coverage Rate:

22 sq. ft. (2.0 m²) per bag at ¼ in. (6 mm) thickness

Approximate Final Set ASTM C191: 60–90 minutes¹

Approximate Walkable (light foot traffic): 2 hours (after set)

Thickness Range: 1/4 in. – 3 in. (6 mm – 76 mm)

Packaging: 50 lb. (22.7 kg) multiwall paper bags

Approximate Compressive Strength (aggregated) ASTM C472 (modified):

4,500 – 5,500 psi¹ (31.0 – 37.9 MPa)

Approximate Dry Density (aggregated): 123 – 130 lbs./cu. ft. (1,970 – 2,082 kg/m³)

Note

- Results 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 and USG Durock™ Surface and Surface FR Self-Leveling Underlayments, as well as differences in mixing/pumping equipment.

UL DESIGNATION TYPE HSLRK

PRODUCT INFORMATION

See usgperformanceflooring.com for the most up-to-date product information.

GREENGUARD INFORMATION

GREENGUARD Certified products are certified to GREENGUARD standards for low chemical emissions into indoor air during product usage. For more information, visit ul.com/gg.

DANGER

Causes skin irritation. Causes serious eye damage. May cause an allergic skin reaction. 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
KEEP OUT OF REACH OF CHILDREN.

TRADEMARKS

The trademarks USG, DUROCK, LEVELROCK, RH-100, SURFACE, IT'S YOUR WORLD. BUILD IT., the USG logo, the design elements and colors, and related marks are trademarks of USG Corporation or its affiliates. LEED is a registered trademark of the U.S. Green Building Council. Plexiglas is a trademark of Arkema France Corporation.

NOTE

The information in this document is subject to change without notice. USG Corp. assumes no responsibility for any errors that may inadvertently appear in this document. Consult your USG Company sales office or representative for information.

NOTICE

We shall not be liable for incidental and consequential damages, directly or indirectly sustained, nor for any loss caused by application of these goods not in accordance with current printed instructions 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 applicable SDSs and literature before specification and installation.

G230, G516, G524, G535, G551*, G553*, G556, G559, G561, G562, G564*, G566, G587, G588, G591, G592, H502, 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, L533, L534, L535, L536, L537, L538, L539, L540, L541, L542, L543, L545, L546, L547, L549, L550, L551, L552, L556, L557, L558, L559, L560, L562, L563, L564, L565, L568, L569, L570, 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*, M525, M527, M530, M531, M532, M534, M535, M536, M538, M541.

For the most up-to-date UL Designation Type HSLRK, 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.

STORAGE

USG Durock™ Surface and Surface FR Self-Leveling Underlayments should be stored in an enclosed shelter providing protection from damage and exposure from the elements at a temperature of 50–90 °F (10–32 °C). During winter, dry mix material should be stored in a heated room before application. Remove damaged or deteriorated materials from the job site. USG Durock™ Surface and Surface FR Self-Leveling Underlayments have a shelf life of 12 months from the manufactured date.

SUBMITTAL APPROVALS

| | |
|-------------------|-------------|
| Job Name | |
| Contractor | Date |

800 USG.4YOU
800 (874-4968)
usgperformanceflooring.com
usgdesignstudio.com

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

CB5090-USA-ENG/rev. 10-18
© 2018 USG Corporation and/or
its affiliates. All rights reserved.
Printed in U.S.A.

USG
IT'S YOUR WORLD. BUILD IT.®