Submittal Sheet

Durock™ Self-Leveling Underlayment

SPEED™

High alumina cement-based poured underlayment

- Ideal over concrete and wood subfloors
- Fast application, fast-setting allows for quick return of normal trade traffic
- Smooth, crack-resistant surface
- Formulated using HAC based/Portland cement blend (ASTM C150)
- Meets requirements of ASTM F-710 “Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring”
- Designed for fast track installations
- May assist in obtaining LEED® credits

Description

DUROCK™ SPEED self-leveling underlayment is a fast-applying high alumina cement based self-leveling underlayment formulated for interior use over concrete subfloors and wood subfloors. This high strength underlayment (a minimum compressive strength of 5250 psi after 28 days drying time) is mixed with water at the job site to yield a smooth and monolithic surface of up to 2 in. thick (deep fills up to 5 in. when extended). A ¼-inch thick underlayment has an approximate weight range of 2.6 to 2.7 lbs./sq. ft. and an approximate dry density range of 125 to 130 lbs./cu. ft. Floor covering can be installed in as little as 16 hours, depending on underlayment thickness and drying conditions.

Installation

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.

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

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 and tensile strength over the entire pour area. The assessment of concrete tensile strength must be made in its existing state without the removal of any foreign material that may be present on the concrete surface. 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, mechanically profile concrete subfloor to a range of CSP 3 to CSP 5, in accordance with the industry standards as outlined in International Concrete Repair Institute (ICRI) *Technical Guideline No. 310.2 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.* Use mechanical removal methods such as shot blasting, scarifying or diamond grinding to clean and prepare the concrete subfloor contaminated with adhesives, asphalt or oil. Shot-blasting is the preferred method of mechanically profiling and preparing the concrete subfloor for the application of DUROCK SPEED self-leveling underlayment.

The tensile bond strength of the concrete subfloor over which DUROCK SPEED self-leveling underlayment is being applied must be a minimum of 175 psi when tested per the ASTM C1583 standard.

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./1000 sq. ft./24 hours per ASTM F1869 must be treated with an appropriate moisture mitigation system that either reduces the flooring systems’ moisture vapor exposure to acceptable levels, or completely stops the vapor transmission through the top of the subfloor. SPEED self-leveling underlayment is not a vapor barrier. Transmission of excessive

moisture vapors from the concrete subfloor through SPEED self-leveling underlayment can interfere with floor-covering adhesives and compromise their performance. Apply an industry recognized moisture mitigation system per manufacturer recommendations to achieve an MVER value of 5 lbs./1000 sq. ft./24 hours or less. Ensure compatibility of the moisture mitigation system with the DUROCK SPEED self-leveling underlayment by a test application in small areas. Contact USG Technical Service (1 800 USG.4YOU) for further information regarding suitable moisture mitigation products and systems for use with SPEED self-leveling underlayment.

Fill deep areas and holes prior to final application. See *Deep Fill Application*.

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 DUROCK SPEED self-leveling underlayment. Repair all existing cracks in old and new concrete to minimize and control their ability to telegraph through the layer of SPEED self-leveling underlayment. 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 SPEED self-leveling underlayment. Growth of existing cracks or formation of new cracks in the concrete subfloor can lead to cracks telegraphing through SPEED self-leveling underlayment. Respect existing expansion and control joints.

SPEED self-leveling underlayment can be applied with metal lath over engineer-approved, APA-Rated exterior glue plywood or oriented strand board (OSB) (i.e., APA-Rated Exterior or Exposure 1 panels) wood subfloors following the Tile Council of North America's F-185-11 specification at a minimum ½ in. depth. Subfloor must be properly prepared and primed with DUROCK™ primer-sealer. See *Notes/Limitations* for subfloor deflections.

SPEED self-leveling underlayment 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 build-up, 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.

SPEED self-leveling underlayment will set in approximately 2 hours under normal conditions. Light foot traffic can occur approximately 2 – 4 hours after set; normal trade traffic can resume the next day. After SPEED self-leveling underlayment is firmly set, provide adequate ventilation to ensure uniform drying of the installed SPEED 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
- Studded 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. 320.5-2012)
- 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. 320.5-2012)

- 1 in. x 2 in. brass or plastic cylinder
- 12 in. x 12 in. x ¼ in. Plexiglas® sheet
- Minimum 2 in. putty/drywall taping knife
- Ruler or tape measure

Priming

Use DUROCK primer-sealer, a low VOC, high-solids acrylic primer, for sealing the concrete, wood or gypsum subfloor prior to application of DUROCK SPEED self-leveling underlayment. Proper use of DUROCK primer-sealer effectively seals the subfloor and prevents formation of pinholes, domes and craters in SPEED self-leveling underlayment due to the upward migration of air bubbles from the subfloor. Note – do not apply SPEED self-leveling underlayment over gypsum underlayment unless sealed with DUROCK primer-sealer.

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, adhesives, paint, chemicals, loose topping, joint compounds from drywall installation or any other contaminant that might interfere with development of good bond.

Apply DUROCK primer-sealer in a two-step application. For the first application, dilute 1 part DUROCK primer-sealer to 4 parts of water. Mix the diluted solution with a paddle mixer at slow speed for approximately 1 minute. Next, apply primer solution to the subfloor at a coverage rate of approximately 200-300 sq. ft./gal. using a soft push broom. Apply evenly and do not puddle. The actual coverage of the primer will depend upon the nature and porosity of the subfloor. High absorption concrete will require more primer. Allow the first coat to dry for a minimum of 1 hour prior to the application of the second coat.

For the second application, dilute 1 part DUROCK primer-sealer to 1 part of water. Mix gently with a paddle mixer at slow speed for approximately 1 minute. Next, apply the primer solution to the subfloor using a soft push broom. Apply the primer evenly and do not puddle. The coverage rate of the diluted primer is approximately 300 sq. ft./gal. Again, the actual coverage of the primer will depend upon the nature and porosity of the subfloor. Allow the second coat to dry to a clear thin film for a minimum of 3 hours and a maximum of 16 hours before recoating will be necessary. High air relative humidity and/or low subfloor temperature may necessitate a longer drying time. Primer must be completely dry before application of SPEED self-leveling underlayment. Extremely porous concrete subfloors may require an additional 1:1 application.

For primer application, the temperature of DUROCK primer-sealer, the subfloor and the room must be maintained between 50 °F and 95 °F for a period of 48 hours before and after application.

Barrel Mixing

When opening bags, 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 5.0 to 5.5 quarts (4.75 to 5.25 liters) of cool, clean potable water **for each** 1 bag (50 lbs.) of DUROCK SPEED 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 homogeneous and lump free.

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

Do not add additional water until the 2 minute mixing cycle has been completed. Do not overwater the material. If additional water is required, add no more than 0.4 liters per bag and mix for 30 seconds or until mix is homogeneous. Do not over mix (more than 3 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.

Continuous Mixer and Pump

DUROCK SPEED self-leveling underlayment can be mechanically mixed with a continuous mixer and pump or with a batch mixer and pump, similar to type G as found in section 5.0 of the *Technical Guidelines*, prepared by the International Concrete Repair Institute, *Pictorial Atlas of Concrete Repair Material Mixing Equipment* (Guideline No. 320.5-2012). Mixer and pump must be clean, calibrated and in good working condition. Pressure test the rotor and stator assembly to ensure proper pumping. Use the mixture proportions specified in the *Barrel Mixing* section to prepare the material. When opening bags, use engineering controls including local exhaust to reduce exposure to dust. Wear NIOSH-recommended respirator if needed. Do not overwater the material.

Prior to pumping SPEED self-leveling underlayment slurry, the hose must be conditioned with water. Add clean water to the pump well and turn pump on until water has reached the end of the hose. Turn pump off, drain water, pump and hose. Pump and hose are now ready to accept SPEED self-leveling underlayment slurry. Check the consistency, flow behavior and uniformity of the mixed material exiting at the end of the hose. Perform a slump test on the material before application. See *Test Procedures* for instructions. Adjust the water flow rate to ensure that the mixed material is free of bleed water and material segregation (settling of sand). Use a mesh screen sock at the end of the hose to capture any large hardened particles that could become loose from the mixer or the hose.

Ensure that the minimum length of the slurry hose is equal to or greater than 100 feet. If the continuous mixer and pump are not operational for about 15 minutes, clean the entire system with water to maintain smooth and consistent equipment performance upon restart.

Test Procedures Slump Test

Set Plexiglas sheet on a level, stable surface, away from foot traffic. Ensure that the 1 in. x 2 in. cylinder is clean and dry. Place the cylinder in the middle of the Plexiglas sheet. Pour the DUROCK SPEED 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. Ensure that the average patty diameter is within the 5.75 in. to 6.75 in. range.

Application

During application and until the DUROCK SPEED self-leveling underlayment is firmly set (typically the first 2 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. After 24 hours, the HVAC system can resume, as well as the use of doors, windows and other openings.

The SPEED product–either mixed or in powdered form, subfloor and room temperature must be between 50 °F and 95 °F at the time of application and for 72 hours after installation of DUROCK SPEED self-leveling underlayment. For temperatures above 95 °F, follow the American Concrete Institute (ACI) *Hot Weather Concrete* guidelines to ensure proper installation.

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.

SPEED self-leveling underlayment has a flow time of approximately 15 – 20 minutes at 70 °F. 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 SPEED 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.

Apply the SPEED 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 the SPEED self-leveling underlayment against an edge that has been allowed to set, the edge of the previous pour should be treated with DUROCK primer-sealer.

Deep Fill Application

Contact USG for information.

Floor-Covering Installation

- DUROCK SPEED self-leveling underlayment can typically accept foot traffic 2 to 4 hours after initial set time.
- Moisture-insensitive tiles can be installed in as little as 4 hours after installation, depending on underlayment thickness and drying conditions.
- All other floor coverings can be installed in as little as 16 hours after installation, depending on underlayment thickness and drying conditions.
- Check with floor-covering and adhesive manufacturers for installation guidelines and suitability of their manufactured products over SPEED self-leveling underlayment.
- Protect the surface of SPEED self-leveling underlayment from contaminants and water until installation of floor covering is accomplished. Different types of sealers and coatings can be used for this purpose. DUROCK primer-sealer is a particularly suitable sealer for this purpose as its applications enhances wear-resistance and durability of SPEED self-leveling underlayment.
- Perform field bond test to determine adhesive/flooring performance over SPEED self-leveling underlayment. 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 usg.com.

Notes/Limitations

1. Do not use in exterior applications.
2. SPEED self-leveling underlayment can be used as a wear surface with a tested decorative, protective coating system. Coating systems must be tested for adhesion to SPEED self-leveling underlayment. The bond test and performance of coatings is the responsibility of the coating manufacturer. Contact USG for further information regarding decorative coating options.
3. Do not install where continuous exposure to moisture is a possibility.
4. Do not install over dimensionally unstable, improperly prepared, weak subfloors. Tensile strength of concrete over which DUROCK SPEED self-leveling underlayment is installed must be a minimum of 175 psi as tested per the ASTM C1583 standard.
5. Do not install over concrete subfloor less than 28 days old. For untreated (without an approved moisture mitigation system) concrete subfloors less than 28 days old, contact USG.
6. For below-grade applications, contact USG.
7. Do not use over sound mat.
8. 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 services of a professional structural engineer to provide such joints as part of the system in accordance with engineering requirements and industry standards.

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 Durock Speed self-leveling underlayment. Growth of existing cracks or formation of new cracks in the concrete subfloor can lead to cracks telegraphing through the poured underlayment.
10. When the MVER exceeds 5 lbs./1000 sq. ft./24 hours, treat the concrete subfloor with an industry recognized moisture mitigation system in all areas of use where potential for moisture problems may exist. Durock Speed self-leveling underlayment is not a vapor or moisture barrier. Transmission of excessive water vapors or moisture from the concrete subfloor through the Speed self-leveling underlayment can interfere with floor-covering adhesives and compromise their performance.
11. For on-grade applications, use an industry recognized moisture mitigation system 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./1000 sq.ft./24 hours.
12. Do not use acid etching as a method of cleaning and preparing the concrete subfloor.
13. Do not use oil-based sweeping compounds to clean and prepare the concrete subfloor. Use of such sweeping compounds leaves an oil film on the surface of the concrete that will interfere with the underlayment's bond development. Use vacuum, compressed air or a dry broom to remove the dust and debris and prepare the subfloor for Durock Speed self-leveling underlayment application.
14. Do not use adhesive-removing chemicals or solvents to eliminate contaminants from the concrete subfloor. Use of such chemicals can transport oil, grease, and other contaminants further into the concrete pores. These chemicals can be released back to the surface at a later time to interfere with the floor-covering adhesives thus compromising the bond performance with Durock Speed self-leveling underlayment. Mechanically removing the organic adhesives, asphalt, coal-tar based adhesives and other oil-based contaminants is the sole recommended method of preparing the subfloor for application of Speed self-leveling underlayment. Use mechanical removal methods such as shot blasting, scarifying or diamond grinding to clean and prepare the concrete subfloor contaminated with adhesives, asphalt or oil. Shot-blasting is the preferred method of mechanically profiling and preparing the concrete subfloor for the application of Speed self-leveling underlayment.
15. Do not apply over subfloors containing asbestos. Do not mechanically remove organic adhesives, asphalt, coal-tar based adhesives or other materials containing asbestos.
16. Do not overwater or over mix.
17. Do not add any chemical additives or polymers to Durock Speed self-leveling underlayment.
18. Do not use wet curing or curing compounds because Durock Speed self-leveling underlayment is self-curing.
19. Do not mix with other cementitious products or self-leveling materials.
20. Do not apply Durock Speed self-leveling underlayment over wood subfloor without metal lath. Differential or excessive movement of the wood subfloor may lead to development of cracks in Speed self-leveling underlayment at the wood subfloor joints and adjacent areas.
21. 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.
22. Existing gypsum underlayments must be solid with no cracks and dust-free. Gypsum underlayment must be sealed with Durock primer-sealer. First test surface hardness by scratching existing underlayment with a coin. If surface can be gouged, do not use Speed self-leveling underlayment and consult USG for alternative repair methods.

Product Data

DUROCK SPEED self-leveling underlayment is sanded at the factory. Job site addition of sand is not recommended and will void the warranty. SPEED self-leveling underlayment is mixed with water to yield a self-leveling slurry.

Approximate Compressive Strength ASTM C109 (modified)[1]: 2000 – 2500 psi[2] at 24 hours
5250 minimum psi[2] at 28 days

Approximate Dry Density: 125 – 130 lbs./cu. ft.[2]

Mixing Ratio: 5.0 – 5.5 quarts (4.75 to 5.25 liters) of water per 50 lb. bag

Approximate Coverage: 25 square feet per bag at ¼ in. thickness

Approximate Flow Time: 15 – 20 minutes at 70 °F

Approximate Final Set ASTM C191: 60 – 100 minutes[2]

Approximate Walkable (light foot traffic): 2 – 4 hours (after set)

Approximate Flexural Strength ASTM C348: minimum 1000 psi[2]

Approximate Surface pH ASTM F710: 11

Packaging: 50 lb. multiwall paper bags

Notes
1. ASTM C109 modified refers to air-drying as opposed to damp curing.
2. Compressive strengths published herein were achieved under controlled laboratory conditions. Actual field results may differ due to environmental conditions, inconsistent proportioning of field applied water and SPEED self-leveling underlayment, as well as differences in mixing/pumping equipment.

Storage

DUROCK SPEED self-leveling underlayment should be stored in an enclosed shelter providing protection from damage and exposure from the elements. During winter, dry mix material should be stored in a heated room before application, as deeply cooled material may increase the risk that some additives may not dissolve during mixing. If temperature is too high, premature setting may occur. Remove damaged or deteriorated materials from the job site. SPEED self-leveling underlayment has a shelf life of 6 months from the manufactured date.

Submittal Approvals

Job Name	
Contractor	**Date**

Product Information
See usg.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.

DANGER!
When mixed with water, this material hardens and becomes very hot – sometimes quickly. DO NOT attempt to make a cast enclosing any part of the body using this material. Failure to follow these instructions can cause severe burns that may require surgical removal of affected tissue or amputation of limb. Direct contact can be corrosive and cause severe damage or chemical burns to the eyes and wet or moist skin. Avoid contact with eyes and skin. Wear eye protection, alkali-resistant protective gloves, long-sleeved shirts and pants to prevent direct contact. If eye contact occurs, immediately flush thoroughly with water for 30 minutes and seek medical advice. Inhalation of dust may be corrosive or cause chemical burns or irritation to nose, throat and respiratory tract. Long-term breathing of respirable crystalline silica dust can cause permanent lung damage and/or cancer. Avoid breathing dust. Use in a well ventilated area or provide sufficient local ventilation. If dusty, wear a NIOSH/MSHA-approved dust respirator. Wash thoroughly with soap and water after use. Do not ingest. If ingested, call physician. Product safety information: 800 507.8899 or usg.com.
KEEP OUT OF REACH OF CHILDREN.

Trademarks
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Safety First!
Follow good safety/industrial hygiene practices during installation. Wear appropriate personal protective equipment. Read MSDS and literature before specification and installation.

Manufactured by
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