LEVEL-FLO® 200 UNDERLAYMENT

Self-leveling interior underlayment ⅛ in. to 2 in. neat, up to 5 in. extended

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1. PRODUCT NAME

Tech-Mix® Level-Flo® 200 Underlayment

2. MANUFACTURER

TCC Materials®
2025 Centre Pointe Blvd., Suite 300
Mendota Heights, MN 55120 USA

Phone: 1.651.688.9116
Fax: 1.651.688.9164
Internet: tccmaterials.com

Tech-Mix® is a registered trademark of TCC Materials®

3. PRODUCT DESCRIPTION

Tech-Mix Level-Flo 200 Underlayment is a high-performance, fiber-reinforced, non-gypsum based, self-leveling underlayment that provides a flat, extremely smooth, durable surface for finished floor covering installation. Level-Flo 200 is designed for the fast leveling of floors. Use with Tech-Mix Level-Flo Primer on porous surfaces, or Level-Flo Primer Pro on non-porous surfaces, both sold separately.

FEATURES AND BENEFITS

- Fiber reinforced
- Provides a flat, smooth surface
- Applications from ⅛-2 in. (3-51 mm) neat and up to 5 in. (127 mm) extended
- Walkable in 3-4 hours
- Accepts non-moisture sensitive tile and stone in 4 hours
- Install moisture sensitive floorcoverings in 16-24 hours
- Encapsulate radiant heat systems

WHEN/WHERE TO USE

- Interior underlayment only
- Level and smooth on, above, or below grade surfaces including concrete, ceramic tile, quarry tile, terrazzo, metal, non-water soluble adhesive residue, and solid wood floors

SAFETY

READ THE SAFETY DATA SHEET (SDS) BEFORE USING THIS PRODUCT. SDS information is available on our website: tccmaterials.com or contact TCC Materials at 651-688-9116 (7:30 AM to 4:00 PM, M-F, Central US Time).

CAUTIONS

Read complete cautionary information printed on product container prior to use.

This Product Data Sheet has been prepared in good faith on the basis of information available at the time of publication. It is intended to provide users with information about and guidelines for the proper use and application of the covered Tech-Mix brand product(s) under normal environmental and working conditions. Because each project is different, TCC Materials cannot be responsible for the consequences of variations in such conditions, or for unforeseen conditions.

4. TECHNICAL DATA

Typical Values • Level-Flo 200	
Mix Ratio (Water to Powder)	5 qt. (4.73 L) per 50 lb. (22.7 kg)
Working Time @ 70°F (21°C)	≥ 20 minutes
Set Time ASTM C191	
Final Set @ 70°F (21°C)	80-120 minutes
Compressive strength ASTM C109 (air cured)	
28 days	≥ 5,000 psi (34.5 MPa)
Flexural Strength ASTM C348	
28 days	≥ 900 psi (6.2 MPa)

Greater than: > Greater than or equal to: ≥ Less than: < Less than or equal to: ≤

Note: Test results obtained under controlled laboratory conditions at 70°F (21°C) and 50% relative humidity. Reasonable variations can occur due to atmospheric and job site conditions.

LEED® ELIGIBILITY[1]

- Regional Materials (MR-c5)
- Low-Emitting Materials (IEQ-c4.3)

AVAILABLE SIZES

Gray 50 lb. (22.7 kg) bag (BOM #120737)

SHELF LIFE

12 months from the date of manufacture when stored in the original, unopened container, away from moisture, under cool, dry conditions and out of direct sunlight.

5. INSTALLATION

PREPARATION

Read all directions before starting work. Acclimate water and powder to room temperatures of 65°F-75°F (18°C-24°C) for a minimum of 24 hours prior to installation. Proper surface repair preparation is crucial to achieving a successful application. Restrict Level-Flo 200 Underlayment from moving to unwanted areas by creating small dams constructed of 1”x2" lumber edges wrapped with duct tape. Install expansion joints where underlayment cement meets retraining surfaces such as perimeter walls and sharp corners such as column bases, pedestals, supports, etc. using ¼ in. (6 mm) foam tape or caulking.

SUITABLE SUBSTRATES (PROPERLY PREPARED) INCLUDE:

- Concrete
- Cementitious backer units (CBU or cement board)
- APA rated exterior grade/exposure 1 plywood or OSB underlayment grade equivalent
- Cold rolled steel
- Existing ceramic tile

INTERIOR CONCRETE SUBSTRATES:

- Concrete must be fully cured (28 days minimum), free of efflorescence, and not subject to hydrostatic pressure or moisture condensation.
- All surfaces must be stable, solid, and structurally sound.
- Remove all unsound concrete, grease, oil, dirt, paint, sealers, curing compounds, waxes, old adhesive residue, gypsum based underlayments, old flooring, and any other foreign materials that will inhibit adhesion. Mechanical removal is recommended, chemicals often serve to drive them deeper into the concrete substrate.
- Maximum bond over a concrete substrate can be achieved by mechanically profiling the surface either by grinding, shot blasting, sand blasting, or scarifying to achieve an ICRI CSP3 to CSP5 standard. Structurally sound concrete that is porous, and has not been troweled smooth and flat may not require mechanical profiling. Typical applications that fall into this category include precast concrete floor panels, or concrete in new construction that is left unfinished in anticipation of receiving self-leveling underlayment.

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CONCRETE SUBSTRATES: (Cont.)

- After cleaning and profiling, test for MVER (moisture vapor emission rate, reference ASTM F1869) and concrete substrate's relative humidity (RH, reference ASTM F2170). The requirements of the floor covering and floor adhesive manufacturers must be followed with respect to, but not limited to, levels of moisture.
- Repair deep areas, holes, and non-moving cracks with Tech-Mix Feather Edge Pro or Tech-Mix Feather Patch Pro prior to application of self-leveling and allow curing as recommended for the product.
- All surfaces require priming using Tech-Mix Level-Flo Primer or Tech-Mix Level-Flo Primer Pro (see "Priming" section).

Refer to:
ASTM D4259 Abrading Concrete
ACI 201.1R Guide for Making a Conditions Survey of Concrete in Service
ACI 224.1R93 Causes and Repair of Cracks in Concrete Structure
ICRI 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays

ADHESIVE AND CUTBACK RESIDUE OVER INTERIOR CONCRETE:

- Level-Flo 200 Underlayment may be installed over properly prepared cutback or adhesive residue that is on concrete only. All residues must be non-soluble when put in contact with water.
- Before proceeding, test the adhesive residue for water solubility. Water soluble adhesive must be removed mechanically to achieve a clean concrete surface.
- Cutback/adhesive residue must be scraped to as thin a layer as possible and no longer be tacky. Any adhesive residue must be sound and well bonded to the concrete surface.
- Use only Tech-Mix Level-Flo Primer Pro over the cutback/adhesive residue (see "Priming" section).

NON-POROUS SUBSTRATES:

- Level-Flo 200 Underlayment may be installed over non-porous substrates such as epoxy coatings, cold rolled steel, existing ceramic tile, quarry tile, and burnished concrete.
- The substrate must be structurally sound and free from all contaminants such as dust, dirt, grease, and any foreign material that may inhibit adhesion.
- Prepare the surface removing all loose material. Use only Tech-Mix Level-Flo Primer Pro following the mixing instructions on the Primer Pro Technical Data Sheet. Vacuum thoroughly, removing all dust and other loose contaminants before applying the Level-Flo Primer Pro .

INTERIOR PLYWOOD SUBSTRATES:

- Residential and light commercial applications only.
- Follow Tile Council of North America (TCNA) F185 installation method for cementitious self leveling underlayments over plywood.
- All wood subfloors must be structurally sound, securely fastened, and have a maximum deflection of L/360 for ceramic tile, or L/720 for stone (including live, dead, impact, and concentrated loads). The wood must be either ¾ in. (19 mm) tongue and groove, APA rated exterior grade/ exposure 1 plywood or OSB underlayment grade equivalent.
- The surface must be clean, free from any contaminants that may act as bond breakers such as dirt, paint, wall compound, varnish, grease, oils, or wax. Refasten loose boards.
- Allow a ⅛ in. (3 mm) gap between sheets, fill with a flexible sealant or caulk and fill all nail holes or areas where flow could leak.
- Prime clean surface with Tech-Mix Level-Flo Primer (see "Priming" section).
- Securely fasten every 4-6 in. (10-15 cm) either galvanized metal lath or plastic lath designed for this purpose to the wood surface after priming, and prior to applying underlayment cement. Overlap lath edges by ¼ in. (6 mm) and secure using a minimum ⅜ in. (9.5 mm) staple with no gaps, keeping lath flat. Be sure to offset lath joints. To keep the job moving, it is helpful to prime first, then stand on the lath while fastening securely.
- When using Tech-Mix Level-Flo 200 over lath, install no less than ¼ in. (6 mm) thickness of self-leveling above the surface of the lath.

Note: Before installing Tech-Mix products the installer is responsible for ensuring that the wood subfloor is structurally sound and clean.

Note: It is the responsibility of the installer/ applicator to ensure the suitability of the product for its intended use.

PRIMING

Substrate	Primer to Water Ratio	Coverage Sq. Ft. per Gallon
Porous concrete * (two coats may be required for highly porous substrates)	Level-Flo Primer 1:1	330 Sq. Ft. / Gal (30.6 m2)
Plywood	Level-Flo Primer 3:1	250 Sq. Ft. / Gal (23.2 m2)
Tile / Linoleum / Steel	Level-Flo Primer Pro Full Strength	140 Sq. Ft. / Gal (13 m2)

* Second coat is required on highly porous substrates if initial application is rapidly absorbed and dries in less than 1 hour. The second coat primer to water ratio is 1:3

- Level-Flo Primer/Primer Pro must be applied over the entire substrate leaving no bare spots, puddles or excess primer. Apply with brush or roller on non -porous surfaces, or push broom on porous surfaces.
- Do not apply over standing water.
- For non-porous substrates, terrazzo, and tight concrete use Level-Flo Primer Pro.
- Allow the primer to dry to tacky translucent film with no milky wet spots, typically 1-3 hours. If the primer turns clear within 30 minutes of application the substrate is highly porous and requires a second coat. Primer/Primer Pro must be completely dry before installing Level-Flo 200 Underlayment.
- Primer must be reapplied if not covered with Level-Flo 200 Underlayment within 24 hours or if it becomes contaminated by other trades.

Note: Reference Level-Flo Primer and Level-Flo Primer Pro for more information.

JOB MOCKUPS

The manufacturer requires that when its Tech-Mix products are used in any application or as part of any system that includes other manufacturers' products, the contractor and/or design professional shall test all the system components collectively for compatibility, performance and long-term intended use in accordance with pertinent and accepted industry standards prior to any construction. Written documentation of the tests performed shall be satisfactory to the design professional and contractor. Test results must include the means and methods of application, products used, project-specific conditions being addressed, and standardized tests performed for each proposed system or variation.

MIXING

BUCKET MIXING:

1. In a clean 5 gal. container, add 5 qt. (4.73 L) of clean, cool, potable water. Next add the 50 lb. (22.7 kg) bag of Level-Flo 200 powder, while mixing at full speed using a square mortar paddle mixing blade attached to a heavy-duty ½ in. drill (400-600 rpm). Measure water carefully, be accurate, DO NOT ADD EXTRA WATER.
2. Mix completely for a minimum of 2 minutes until lump free, adding no additional water. Avoid over watering, over mixing, or moving the mixer up and down during mixing as this will entrap air, lower the strength, and may cause cracking and/or pin-holing. The formation of a white film on the surface is an indication of over watering.
3. For larger jobs, to keep the job moving, it is recommended that multiple mixing containers be used simultaneously. This will allow one mixing container to be poured while the other is being mixed.
4. After use clean all mixing equipment thoroughly to avoid hardened product in subsequent batches.
5. Do not mix more product than can be applied during the 20 minute working time.

BARREL CONTAINER MIXING:

1. Mix 2 bags of Level-Flo 200 Underlayment at a time. In a clean 20-25 gal. container add 5 qt. (4.73 L) of clean, cool, potable water for EACH 50 lb. (22.7 kg) bag. Next add the Level-Flo 200 Underlayment powder, while mixing at full speed using an egg-beater mixing blade attached to a heavy-duty ½ in. drill (min. 650 rpm). DO NOT ADD EXTRA WATER.
2. Mix completely for a minimum of 2 minutes until lump free, adding no additional water. Avoid over watering, over mixing, or moving the mixer up and down during mixing as this will entrap air, lower the strength, and may cause cracking and/or pin-holing. The formation of a white film on the surface is an indication of over watering.
3. To keep the job moving, it is recommended that multiple mixing drums be used simultaneously. This will allow one mixing container to be poured while the other is being mixed
4. After use clean all mixing equipment thoroughly to avoid hardened product in subsequent batches.
5. Do not mix more product than can be applied during the 20 minute working time.

APPLICATION

Apply only to surfaces that are frost free and between 50°F-90°F (10°C-32°C) for 24 hours prior and 48 hours after.

1. Close all windows, doors, and HVAC vents to minimize air flow. Divide the areas to permit continuous placement without cold joints.
2. Pour the blended Level-Flo 200 Underlayment across the floor in a uniform manner to achieve a flat floor and disperse with a gauge rake. Use cleated shoes to avoid leaving marks.
3. To prevent ridges between batches, use a smoother tool and work a narrow dimension, best results are obtained pouring across the shorter distance in the room. Optimum results can be obtained by providing a continuous wet flow throughout the placement, always pouring into a wet edge.
4. Troweling is not recommended, do not overwork material once it is on the floor.
5. Level-Flo 200 Underlayment has a working time of ≥ 20 minutes at 70°F (21°C). Temperatures and humidity will affect flow, working time, and set time.
6. If a higher build-up is needed over the first pour, allow 24 hours drying time between pours and prime surface again with Tech-Mix Level-Flo Primer.
7. Level-Flo 200 Underlayment will not correct or compensate for a structurally defective substrate. Faults in the substrate can appear in the underlayment. The use of alkali resistant glass fabric or galvanized metal reinforcing (Federal Specification QQL.101C) can be helpful in reducing reflective cracking.
8. Typically surfaces will accept foot traffic in 3 to 4 hours, non-moisture sensitive tile and stone in 4 hours, and resilient flooring after 16-24 hours at temperatures of 72°F (22°C).

INCREASED THICKNESS:

1. Level-Flo 200 can be extended with aggregate for applications from 2 in. up to 5 in. (51-127 mm). To extend, blend the Level-Flo 200 with washed, dried, clean ⅜ in. (10 mm) pea gravel.
2. Mix first with according to regular mixing instructions with water, then add 15 lb. (6.8 kg) of aggregate per 50 lb. (27.2 kg) bag of Level-Flo 200, mixing until the aggregate is coated, then place.
3. Wet aggregate may cause over watering and the addition of aggregate will reduce the workability and may necessitate a finish coat to obtain a smooth surface finish.
4. Allow the extended layer to dry, normally 24-36 hours.
5. If applying a finish coat, prime the surface with Level-Flo Primer mixed 1:1 with potable water per priming instructions outlined in the Level-Flo Primer/Level-Flo Primer Pro technical datasheet.
6. Finish coat of Level-Flo 200 can be applied after primer has dried.
7. Outgassing can occur when applying multiple lifts.
8. If capping is required, contact TCC Materials.

OVER RADIANT HEAT SYSTEMS:

- When radiant heat tube systems are embedded, tubing shall be covered a minimum of ¾ in. (19.1 mm) and installation shall comply with Section 1906.3 of the 2000 International Building Code® (IBC) or Section 1906.3 of the 1997 Uniform Building Code™ (UBC).
- When radiant heat cable systems are encapsulated, wires shall be covered a minimum of ¼ in. (6 mm) and installation shall comply with section RH140 of the Tile Council of North America (TCNA) Handbook.

OVER RADIANT HEAT SYSTEMS: (Cont.)

- An anti-fracture membrane such as Tech-Mix Waterproofing & Crack Isolation Membrane should be applied over the cured self-leveling underlayment prior to installation of ceramic tile or stone.

EXPANSION AND CONTROL JOINTS:
Honor all existing expansion joints, control joints, and moving cracks through the Level-Flo 200 Underlayment. Failure to do so could result in delamination or cracking of the Level-Flo.

Note: When vinyl, wood, or other types of floor coverings are to be installed over Tech-Mix Level-Flo 200 Underlayment, the requirements of the floor covering manufacturer are to be followed with respect to, but not limited to, levels of moisture.

Refer to:
RFCI (Resilient Floor Covering Institute publication) MRP: Addressing Moisture Related Problems Relevant to Resilient Floor Coverings Installed Over Concrete

WFNA (National Wood Flooring Association) publication: Installing Hardwood Flooring, Rev 3/10/98

TCNA (Tile Council of North America) Handbook: Ceramic Tile Installation

American National Standard Specifications: Installation of Ceramic Tile

UBC (Uniform Building Code) 1997 Volume 1, Section 1906.3.10

CURING

- Protect from excessive drying due to temperatures, air movement, and direct sunlight.
- The use of damp curing or the use of curing compounds is not recommended.
- Turn off all forced-air ventilation whenever possible for up to 24 hours after installation.
- Allow 14 days curing time before turning on in-floor radiant heating systems, and bring heat up slowly during the first usage.

Note: Level-Flo 200 Underlayment is not a wearing surface and should be protected from construction trade traffic until the final floor covering is applied.

CLEANING

Use clean potable water to clean all tools immediately after use. Dried material must be mechanically removed. Use a waste water hardener (e.g. Conglez™ or similar product) for cementitious waste disposal.

LIMITATIONS

- Do not use on exterior surfaces.
- Do not trowel or over work.
- Metal or plastic lath design for this purpose is required when going over wood subfloors, it is not needed over concrete surfaces.
- When using Tech-Mix Level-Flo 200 Underlayment over lath, install no less that ¼ in. (6 mm) thickness of self-leveling above the lath surface.
- Do not use as a wearing surface. For a wearing surface, use a Tech-Mix Level-Flo wear topping mix.
- Do not over-water, retemper, or add additional additives.
- Reapply primer if first application is allowed to dry past 24 hours or if the floor has become contaminated by traffic or other trades.
- Do not install over dimensionally unstable substrates such as gypsum, gypsum based patching compounds, particle board, luan, asbestos, or chip board.
- Do not install over old tacky or pressure sensitive adhesive residue, paints, sealers, curing compounds, old flooring, and other foreign material.
- Keep out of contact with aluminum or galvanized surfaces.
- Do not allow heavy or sharp metal objects to be dragged directly across the Level-Flo 200 Underlayment surface. Protect new surface from use until material is completely hard and set.

COVERAGE

Per 50 lb. (22.7 kg) bag

Nominal Thickness	Approximate Coverage
⅛ in. (3 mm)	50 sq. ft. (4.6 m^2)
¼ in. (6 mm)	25 sq. ft. (2.3 m^2)
½ in. (13 mm)	12.5 sq. ft. (1.16 m^2)
1 in. (25 mm)	6.25 sq. ft. (0.58 m^2)

Note: Coverage will vary depending on the substrate type, surface texture, and application method.

6. AVAILABILITY

To locate Tech-Mix products in your area, please contact:

Phone: 1.651.688.9116
Website: tccmaterials.com

7. WARRANTY

Seller warrants that its product will conform to and perform in accordance with the product specifications. The foregoing warranty is in lieu of all other warranties, expressed or implied, including, but not limited to those concerning merchantability and fitness for a particular purpose. Because of the difficulty in ascertaining and measuring damages hereunder, it is agreed that Seller's liability to the Buyer shall not exceed the total amount billed and billable to the Buyer for the product hereunder.

8. MAINTENANCE

Not applicable.

9. TECHNICAL SERVICES

Technical Assistance:
Information is available by calling TCC Materials (hours 7:30 AM to 4:00 PM, M-F, CST):

Phone: 1.651.688.9116
Fax: 1.651.688.6164
Web: tccmaterials.com

Technical and Safety Literature:
To acquire technical and safety literature, please visit our website at: tccmaterials.com.

10. FILING SYSTEM

Division 3 and Division 9

[1] Tech-Mix® products can contribute to LEED® credits within the Material Resource, (Recycled Content & Regional Materials) and Indoor Environmental Quality (Low Emitting Materials).

WARNING: INJURIOUS TO EYES

KEEP OUT OF REACH OF CHILDREN