

# LEVELINE® FLAT AND SMOOTH

HIGH-PERFORMANCE, LOW-ALKALI, SELF-LEVELING UNDERLAYMENT

## DESCRIPTION

LEVELINE® FLAT AND SMOOTH is a Calcium Aluminate-based, self-curing, self-leveling floor underlayment that is used to create a level, flat and durable surface prior to the installation of finished floor coverings. Mixed with water only, LEVELINE® FLAT AND SMOOTH can be installed from featheredge up to 1/2" (1.3 cm) neat and provides a substrate that can accept porous flooring within 4 hours after application. Finished floor coverings, such as carpet, VCT, vinyl sheet goods, rubber, epoxy, and engineered wood plank, can be installed in as little as 16 hours.

## APPLICATIONS

Concrete  
Wood flooring  
Well-bonded cutback and adhesive  
Terrazzo  
Ceramic or Quarry Tile

## ADVANTAGES

LEVELINE® FLAT AND SMOOTH is suitable for use on all residential, commercial, and institutional applications.

Ideal for pumping and barrel-mixing applications. Maintains healing properties for over 25 minutes.

Moisture resistant: Non-gypsum based.

Contains no protein additives.

Will not harbor or support mold or mildew.

High early strength, walkable in just 3-4 hours.

No dangerous emissions or irritating fumes.

Protection from alkali attack: *Unlike standard primarily portland cement-based products, which can reflect a highly caustic alkali substrate that can break down adhesives and certain pvc floor coverings, LEVELINE® FLAT AND SMOOTH's calcium aluminate base creates a low alkali barrier that can provide protection of these adhesives and floor materials against attack and, ultimately, delamination from aggressive substrates.*

Improved indoor air quality: *When adhesives break down due to alkali attack, toxic elements of the adhesive begin releasing gas. LEVELINE® FLAT AND SMOOTH's calcium aluminate base can prevent this breakdown and improve indoor air quality.*

## TECHNICAL DATA

### Compressive strength (ASTM C109):

|         |                     |
|---------|---------------------|
| 4 hours | 1500 psi (10.3 MPa) |
| 1 day   | 2500 psi (17.2 MPa) |
| 7 days  | 3500 psi (24.1 MPa) |
| 28 days | 4000 psi (27.6 MPa) |

### Set (ASTM C191):

|              |                   |
|--------------|-------------------|
| Working time | 25 minutes        |
| Initial set  | 40 minutes        |
| Final set    | 1 hour 15 minutes |

### Density:

Approximately 120-125 lb per cu ft (1.9-2.0 kg/l)

### Flammability (ASTM E84):

|                   |     |
|-------------------|-----|
| Flame spread      | -0- |
| Fuel contribution | -0- |
| Smoke development | -0- |

### Application temperature range:

50-95°F (10-35°C)

**NOTE:** Above 85°F (29°C), use ACI Hot-Weather Application Guidelines.

### Approximate coverage (Yield) per 50-lb (22.7-kg) bag:

|              |                                 |
|--------------|---------------------------------|
| 1/16" (2 mm) | 100 sq ft (9.3 m <sup>2</sup> ) |
| 1/8" (3 mm)  | 50 sq ft (4.7 m <sup>2</sup> )  |
| 1/4" (6 mm)  | 25 sq ft (2.3 m <sup>2</sup> )  |

### Accepts coverings (70°F (21°C), 50% RH):

|                              |          |
|------------------------------|----------|
| Thinset ceramic tile         | 4 hours  |
| Water-based adhesives        | 16 hours |
| Epoxy/urethane adhesives     | 24 hours |
| Epoxy coatings up to 20 mils | 24 hours |
| Epoxy coatings over 20 mils  | 3-5 days |

**NOTE:** Cooler temperatures, inadequate ventilation and higher humidity can extend drying times.

## STORAGE / SHELF LIFE

12 months from the manufacture date. Always keep in cool/dry place unexposed to sunlight.

## PACKAGING

50-lb (22.7-kg) bags; 2500-lb (1134-kg) Super Sacks.

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## QUALITY CONTROL: The Fail-Safe System

Due to the many variables that can affect consistency and flow in all leveling products, it is recommended that the Penetron Specialty Products' Fail-Safe system be incorporated when mixing the LEVELINE® FLAT AND SMOOTH.

Please obtain a Fail-Safe kit from your Penetron Specialty Product representative prior to mixing.

- To ensure proper consistency and performance, the flow of the material using the Fail-Safe ring should never exceed 12.25" (31 cm).
- As a baseline, mix a 2-bag batch. For each bag, start with 6.5 qt (6.2 l) of water per bag, holding 0.5 qt (0.47 l)/bag in reserve.
- Mix to a smooth lump free consistency and check flow with the Fail-Safe ring. If more flow is desired, slowly add reserve water until the desired flow is achieved, never to exceed 12.25" (31 cm) of flow or the water to exceed 7 qt (6.6 l) per bag.
- Determine the water required to get the desired flow and monitor batches using the Fail-Safe method, making adjustments as necessary to achieve the desired flow, not to exceed 12.25" (31 cm).
- For pumping installations, the mixed material at the end of the hose should produce the same result as the baseline test.

## DIRECTIONS FOR USE

### Surface preparation:

**NOTE:** LEVELINE® FLAT AND SMOOTH should not be installed over gypsum, latex patches, asphalt, coal tar, or lightweight insulating concrete.

Contact PSP Technical Support if installing over any questionable substrate.

**Concrete floors:** Substrate must be well-bonded and completely clean; free of oil, wax, grease, sealers, curing compounds, asphalt, paint, dirt, loose surface material and any contaminants that will act as a bond-breaker. Weak concrete surfaces must be cleaned down to solid sound concrete by mechanical means. Acid etching or chemical cleaning is not acceptable. Expansion joints in the concrete substrate must be reflected through LEVELINE® FLAT AND SMOOTH.

**Over cutback and adhesive residue:** Cutback and adhesives may contain asbestos fibers, whose inhalation is harmful. Consult government agencies for rules concerning the removal of asbestos-containing flooring and adhesives. Mechanically remove adhesive residue to a translucent, clean, well-bonded film. LEVELINE® FLAT AND SMOOTH can be installed over non-asbestos adhesives if the residue is solid, well-bonded to the substrate and not affected by water. Avoid applications where heat may soften the adhesive, causing de-lamination.

**Wood:** Wooden sub-floors, such as 3/4" (2 cm) tongue and groove, APA rated Type 1, Exterior Exposure plywood and parquet, must be clean, free of varnish, shellac or any contaminant that hinders bond. If needed, sand down to bare clean wood. Do not use chemical cleaners. The substrate must be solid and secure to provide a rigid base. Any moving boards must be properly secured (screwed), and open joints should be filled with a feather-edge patch. Prime the substrate, as outlined in "Priming." Then, anchor a thin galvanized expanded diamond metal lath (3.4 plaster lath) to the sub-floor, securing every 6" (15 cm) to prevent movement, over-lapping adjacent pieces by 1" (2.5 cm).

**Non-porous substrates:** Terrazzo, ceramic and quarry tile, burnished concrete, and epoxy coatings must be solid, well-bonded, clean and free of any bond breaking contaminants, such as glazes, wax, oil, sealers, etc. Surfaces must be mechanically abraded, until a "profile" is obtained. Vacuum all debris, dust and loose material prior to installing the primer.

### Priming:

**Concrete:** Porous substrates must be clean and dry before primer is applied. Sub-floor temperature must be at least 50°F (10°C). One gallon (3.8 l) of PRIMER STX 50™ mixed with one gallon of clean potable water will cover approximately 350-400 sq ft (32.5-37 m<sup>2</sup>) of floor area. Primer must be applied evenly with a nylon push broom with exploded tips. DO NOT use paint rollers, mops, or spray equipment. Apply a thin primer layer, leaving no bare spots, puddles or excess primer. Allow to dry to a clear, thin film (usually 1 to 3 hours, but less than 24 hours). PRIMER STX 100™ may also be used, mixed 3 parts clean potable water to 1 part primer. Coverage is approximately 200 to 300 sq ft per mixed gallon (4.9-7.4 m<sup>2</sup> per liter).

**IMPORTANT:** LEVELINE® FLAT AND SMOOTH must be applied within 48 hours of priming to ensure that a good bond is achieved between primer and substrate.

**Non-porous sub-floors, wood, and cutback:** Prime with PRIMER STX 100™. Apply one coat of undiluted PRIMER STX 100™ using a 3/8" nap roller. Apply a thin film, leave no puddles or bare spots. Allow primer to dry (1 to 3 hours, maximum 24 hours).

**Metal:** Contact your Penetron Specialty Products representative for specific priming recommendations.

### Mixing and installation:

**IMPORTANT:** To ensure installation success, be sure to test a small area for compatibility, bond strength and performance.

**NOTE:** Before application, close all doors, windows, and protect from direct sunlight. These variables can cause uneven curing patterns.

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**NOTE:** Penetron Specialty Products Inc. also recommends setting up a “mixing station,” where all product mixing takes place. Dusting usually occurs in the area where the product is mixed and could have a negative effect on the product’s bond to the substrate. Limiting the areas where mixing occurs can assure that the floor will be kept clean and free of all contaminants.

**Manual installation:** Mix 2-bags of LEVELINE® FLAT AND SMOOTH at a time. For each bag, add 7 quarts (6.6 l) of clean potable water into a mixing drum. Then, add the bags of LEVELINE® FLAT AND SMOOTH, while mixing at full speed with a paddle mixer attached to a heavy duty 1/2” drill (min. 650 rpm). Mix completely for a minimum of 2-3 minutes until lump free, adding no additional water.

Over wood, cutback, metal and non-porous sub-floors, the addition of ACRYLIC BONDCRETE is required to increase the resiliency of LEVELINE® FLAT AND SMOOTH. Mix 2 quarts (1.9 l) of ACRYLIC BONDCRETE with 5 quarts (4.7 l) of water for each bag of LEVELINE® FLAT AND SMOOTH used and combine as outlined above.

Pour the blended LEVELINE® FLAT AND SMOOTH on the floor and disperse with a gauge rake, followed by smoothing the material with a smoother. Cleated shoes must be worn to avoid leaving marks. LEVELINE® FLAT AND SMOOTH will maintain its workability and leveling properties for 25 minutes.

**Pumping:** Please contact Penetron Specialty Products Inc. for instructions on recommended pumping procedures and equipment.

## Curing:

LEVELINE® FLAT AND SMOOTH is self-curing, self-leveling underlayment. Do not use damp curing methods or curing and sealing compounds. LEVELINE® FLAT AND SMOOTH is walkable within 3-4 hours after installation.

Protect LEVELINE® FLAT AND SMOOTH from excessive heat conditions during its initial curing stage. Turn off all forced ventilation and radiant heat systems for the first 24 hours.

## APPLICATION TOOLS

Mixing drum, mixing paddle, depth gage spreader, surface smoother, 1/2” heavy duty drill, and approved pumping equipment.

## CLEAN UP

Clean tools with water immediately after use prior to material hardening.

## SPECIAL CONSIDERATIONS

- Penetron Specialty Products Inc. recommends installing a test area, insuring suitability of LEVELINE® FLAT AND SMOOTH for intended use. During application, prevent excessive air movement but maintain adequate ventilation and protect material from direct sunlight. These variables can cause uneven curing patterns, a false set, and cracking.
- Substrate must have a minimum direct tensile bond test reading of 72 psi (0.5 MPa), per ASTM C1583.

## JOB MOCKUPS

The manufacturer requires that when its Penetron Specialty 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.

## SAFE HANDLING INFORMATION

Avoid contact with eyes and wear suitable protective eyewear. Avoid prolonged or repeated contact with skin. Wear gloves and suitable protective clothing. Do not breathe dust. In case of insufficient ventilation, wear respiratory equipment. Wash clothing before reuse.

**First aid:** Wash exposed skin with soap and water. If breathing is difficult, move person to fresh air.

**Waste disposal method:** This product, when discarded or disposed of, is not listed as a hazardous waste in federal regulations. Dispose in a landfill in accordance with local regulations.

**Additional information:** For additional information regarding personal protective equipment, first aid and emergency procedures, refer to the product Safety Data Sheets (SDS).

KEEP OUT OF REACH OF CHILDREN

**WARRANTY:** PENETRON SPECIALTY PRODUCTS INC. warrants that the products manufactured by it shall be free from material defects and will conform to formulation standards and contain all components in their proper proportion. Should any of the products be proven defective, the liability to PENETRON SPECIALTY PRODUCTS INC. shall be limited to replacement of the material proven to be defective and shall in no case be liable otherwise or for incidental or consequential damages. **PENETRON SPECIALTY PRODUCTS INC. MAKES NO WARRANTY AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED.** User shall determine the suitability of the product for its intended use and assume all risks and liability in connection therewith.

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 Penetron Specialty Products under normal environmental and working conditions. Because each project is different, PENETRON SPECIALTY PRODUCTS INC. cannot be responsible for the consequences of variations in such conditions, or for unforeseen conditions.

**PENETRON SPECIALTY PRODUCTS INC.**

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