

LAVASTONE® 400 Series

PROFESSIONAL SILICATE-BASED, SELF-LEVELING, MULTI-PURPOSE PRODUCT FOR INDUSTRIAL FLOORS

LAVASTONE® 400 Series is an innovative silicate based, eco-friendly, fast-setting, non-shrink, multi-purpose, professional grade self-leveling product mainly for the purpose of creating industrial floors but also can be used to make decorative floors. Product is designed to meet the requirements of industrial floor standards where chemical resistance is required as well as to suit high traffic environments. At the same time, the product also can be used as a binder when combined with other raw materials such as color pigments, stones, gravels, sands, flakes, recycled glass chips, fibers, shells, recycled beads, etc. by mixing together or sprinkling onto the laid surface using appropriate application methods to provide colorful, terrazzo, anti-slip, decorative surfaces according to the needs of the projects.

LAVASTONE® 400 Series is manufactured from inorganic, non-toxic, VOC-free raw materials with outstanding properties to create seamless flooring in various environments with minimal application time, without safety hazards, high product performance and exceptionally durable.

LAVASTONE® 400 Series by itself can be applied in thickness of 2mm-50mm in one single application by self-leveling. Variant products made out from LAVASTONE® 400 Series can be applied to even higher thickness in one layer.

Properties

- Advanced silicate-binder technology, environmentally friendly, non-toxic, no allergic potential.
- 100% inorganic material, no VOC or APEO; low emission (EC¹ PLUS).
- High flowability, fast setting and minimizes waiting time.
- Resistant to chemicals, salt water and freeze-thaw salt.
- Wide range service temperatures; resistant to subzero temperatures, extreme heat and thermal shocks.
- High abrasion resistance.
- Not affected by UV.
- No shrinkage (DIN EN 13454), swelling, natural crazing or cracks.
- Does not create ASR and no efflorescence
- Adhere well to many types of surface especially smooth surfaces such as ceramic tiles, stone slabs, glass surfaces, etc.
- Water vapor permeable, no water stagnation in humid weather.
- Any practical thickness is possible in one layer.
- Can be applied onto surface which contains calcium sulphate or magnesium carbonate.
- Comply with anti-static requirements (DIN EN 6134- <1000 MΩ).
- Can withstand water pressure up to 1.5 bar.
- Easy and fast in application, can be applied by machine.

Application design system

- Primer **LAVASTONE® 120 APM** or equivalent
- Body coat **LAVASTONE® 400 Series** (or variant product)
- Protection sealer **LAVASTONE® 140 SSS** and/or **LAVASTONE® 180 PTS** or **LAVASTONE® 190 PUS** or equivalent to improve chemical resistance, waterproofing abilities as well as stain protection.

Technical Information

Strength class (DIN EN 13813)	CT-C40-F8
Abrasion resistance (BCA)	AR 0.5
Application temperature	+5°C to +45°C
Workability time @ 20°C	approx. 35 minutes
Application thickness	2mm - 50 mm / 1 layer
Load capacity (curing @ 20°C)	
Walkable/ ready for covering	after 4 hours
Light load	after 1 day
Fully loadable (indoor)	after 4 days
Fully loadable (outdoor)	after 7 days
Water mixing ratio	4.5 liters / bag 25 kgs
Strength (DIN EN 13892)	
Compressive strength	approx. 40.0 N/mm ²
Flexural strength	approx. 8.0 N/mm ²
Elastic modulus	approx. 10.0 N/mm ²
Slip resistance (DIN 51130)	
Original	R10
Adding other materials	R11-R13
Consumption	1.8 kg/m ² /mm.
Density	
Bulk density	approx. 1.1 kg/dm ³
Fresh mortar density	approx. 2.0 kg/dm ³
Original color	grey white (~ RAL 9002)
Chemical resistance	pH 3 – 14 (with protection)
Heat resistance	-40°C to 500°C
Fire rating (DIN EN 13813)	A1

Range of usage

- Indoors, outdoors, areas with extreme weather conditions, or difficult application environment, areas require fast application, or require application of different thickness layers on a surface. Use as a coating in areas with high traffic, heavy load and chemical use.
- Can be used to form products with different applications such as: repair material, leveling screed, self-leveling underlayment, tile adhesive, colored or colorless self-leveling coating, terrazzo, sprinkle aggregates, man-made stone surface, anti-slip surface, patterned surface, burnished or polished surface, rendering, precast elements, etc.
- Main areas of application include factories, warehouses, parking lots, airports, seaports, food and beverages processing, pharmaceuticals, traffic works, marines, etc.
- Other areas of application are shopping centers, office complexes, exhibition halls, resorts, hotels, restaurants, luxury housing, hospitals, schools, parks, stadiums, sport centers, etc.

Packaging, shelf life and storage

- 25kg paper bags. The shelf life of 12 months from the date of manufacture is printed on the packing.
- Store in a cool, dry area with stable or controlled temperature (not < 0°C, preferably 10°C - 25°C). Place products on a pallet, at least 300mm above the floor. Seal the opening immediately after taking a portion for use.

Preparation of substrate

Substrate surface prior to application of LAVASTONE® 400 Series shall satisfy the following conditions:

- The substrate is stable, shall not vibrate or crack and ensure sufficient adhesion strength of ≥ 1.5 MPa.
- The surface shall be dry, clean, rough enough and free of all kinds of impurities. Surface preparation using method such as shot blasting, scarifying or grinding is recommended.
- Cracks and holes must be filled with LAVASTONE® 400 Series mixed with dry sand or equivalent materials. Existing structural cracks must be professionally repaired.
- Do not apply cross the expansion joints or on weak bonding surfaces. Saw cut joints shall also be sealed by suitable materials.
- For porous and water-permeable substrate surfaces, shall apply LAVASTONE® 120 APM primer or an equivalent product. When applying primer, ensure that the substrate is fully sealed so to avoid air bubbles being created and also to prevent water in the LAVASTONE® 400 Series layer from penetrating into the substrate, which may affect finished surface quality.
- Wait for the primer to dry enough within 2 hours then apply the coating. In case the primer has been dried for more than 6 hours, it is necessary to reapply new primer before starting the coating. Drying time of the primer may vary depending on temperature and environment conditions. In some special cases, it is necessary to make a sample of at least 1m² to test the adhesion to existing substrate. Please refer to the product technical datasheet of LAVASTONE® 120 APM for more information.
- In case of application on a surface with many contiguous areas made by different materials with different water permeability, an intermediate coating should be applied to maintain color uniformity. A layer with a minimum thickness of 1mm is recommended. Always apply additional primers on the intermediate coating surface before applying the next coating.

Mixing and applying LAVASTONE® 400 Series

Water mixing ratio

- Pour the required amount of clean water into the mixing bucket (4.5 liters of clean water for the original 25kg LAVASTONE® 400 Series – equals to 18% by weight). The amount of water may change depending on the application conditions at the site.
- It is not recommended to use less than 17% water as it is possible that inadequacy may result in surface cracking due to lack of sufficient hydration.
- It is not recommended to use more than 20% water because the quality of the finished layer as well as the dispersion of the color may be affected if mixed with color.

Mixing

It is recommended to use adjustable high-speed batch mixer, especially those designed specifically for mixing self-leveling screeds which blends powder with water. Please refer to the mixers provided by manufacturers such as PORTAMIX, COLLOMIX, etc.

- Step 1. Turn on the mixer, keep at slow speed, slowly pour the LAVASTONE® 400 Series powder into the mixing bucket that has enough water for a period of 30 seconds to 1 minute.
- Step 2. Switch the mixer to high speed and keep mixing continuously for 2 minutes. Use a hand shovel or hand trowel to brush off the powder on the mixing drum surface and mixing paddle.
- Step 3. Turn off the mixer and wait for 3 minutes. This time will allow the powder to hydrate sufficiently with water and help to release the air from mixture.
- Step 4. Continue mixing at slow speed for 1 minute to ensure the powder and water are completely mixed. In case of mixing with additional materials such as sand or aggregates, continue mixing and then slowly pour those materials into the mixing drum. After dosing in the additional materials, mix for 1 more minute to ensure the mixture is uniformly mixed before pouring out to apply.
- Step 5. Transfer the mixed materials to the application area and perform the next application steps.

Application

- Step 6. Spread mixed materials evenly on the floor. It is important to ensure the continuity of the previous and next batch to avoid the case that the previous one has dried up before the next one is applied which may lead to streak marks.
- Step 7. Use the level spreader or screed box to lay the mixture with the specified thickness on the floor surface. For narrow areas, confined space or edges shall use a hand trowel to spread the mixture to ensure enough of the thickness.
- Step 8. Use either hand trowel or smoothing squeegee to smoothen the entire surface if needed.
- Step 9. Use a spike roller to roll evenly over the smoothed surface to help break the air and make the surface more even. Always roll in criss-cross directions and avoid rolling too quickly that could slip or cause material splashes to undesired places. Do not roll on areas where the mixture has begun to set.

Apply protection layers

- To improve the chemical and wear resistance for the finished surfaces, it is recommended to apply additional layers of LAVASTONE® 140 SSS material or equivalent.
- To cover the surface, to minimize the possibility of contamination or staining, it is recommended to apply additional coats of protective surface material such as LAVASTONE® 180 PTS or LAVASTONE® 190 PUS or equivalent product.
- Please refer to the technical datasheet of the above products carefully before use.

Application tools and cleaning

- Adjustable high-speed batch mixer or screed pump, spike shoes, spike roller, smoothing squeegee, hand shovel, hand trowel, level spreader.
- All application machines and tools should be cleaned immediately with clean water after using. Waste water, spilled materials need to be collected and handled properly to ensure safety for the environment and people.

Attention

- Always apply LAVASTONE® 120 APM primer or equivalent on surfaces which is to receive LAVASTONE® silicate mortars including repaired spots or filled joints before starting the next LAVASTONE® coating.
- Always use spike shoes to walk on poured surface during application.
- The floor surface after application must be protected from drying too quickly (away from wind or high temperatures) for at least 24 hours. Do not cover the finished surface during this time.
- In case of application outdoors, in direct sunlight or in areas with strong winds, it is necessary to cover the application areas against the phenomenon of surface drying too quickly.
- In case of using a screed pump or a combination of a batch mixer and a screed pump, the instructions for use of these machines should be carefully read. Additional application notes can be found on our site at www.LAVASTONE.world.
- Some minor difference in color that might occur is unavoidable by different production batches. This shall be kept in mind when doing product design and selection. It shall be noted that using products with the same production batch (see product labels) will minimize the potential for color heterogeneity. Using different amounts of water or changing application techniques during application may cause different color appearance on the coating surface. Please note that this product is an inorganic / mineral product. Therefore, product colors are not exactly same as those colors in the RAL Color Charts and the Charts shall therefore be used for reference only.
- Products need to be applied by professional applicators that have been trained and certified by GCM Global or authorized partners. Finish product quality may vary depending on the management skills, experience, technical understanding, workmanship, application equipment and tools of each applicator.

Safety Information

- There is no mandatory hazard labeling required for the LAVASTONE® 400 Series. Avoid inhalation of dust when opening the bag. Protect skin and eyes during mixing and application.
- Please refer to the Material Safety Data Sheet which can be found on our site at www.LAVASTONE.world for more information on safety during the transportation, storage, lifting and handling of waste. Follow the instructions on the packing and related documents.

Variant products

Below is a list of variants derive from LAVASTONE® 400 Series used as a binder blended with colors and aggregates using different application methods to create various desired finishing:

- **LAVASTONE® 401 SLU – Self-leveling Underlayment Without Colors**
Self-leveling underlayment with natural color or use as repair mortar. Thickness from 2mm or more for self-leveling layer and 1mm or more when used for repair works.
- **LAVASTONE® 402 SLC – Self-leveling Topping With Colors**
Self-leveling floor mixed with colors. Sand or aggregate can also be mixed to increase thickness. Typical thickness from 2mm - 50mm / 1 layer.
- **LAVASTONE® 403 FQS – Flake, Quartz, Sand Sprinkle**
Sprinkle floor with quartz, flakes or other materials to create surface different textures. Typical thickness from 3mm or more.
- **LAVASTONE® 405 PSS – Polished or Burnished Surface**
Surface can be burnished to create sheen or ground and polished to expose aggregates. Typical thickness from 5mm or more.
- **LAVASTONE® 408 MTZ – Micro Terrazzo**
Terrazzo floor using aggregates with size smaller than 4mm. Typical thickness from 4mm or more.
- **LAVASTONE® 412 LTZ – Medium to Large Terrazzo**
Terrazzo floor using medium to large aggregates with size from 4mm to 35mm. Typical thickness from 10mm to 35mm.
- **LAVASTONE® 415 ETZ – Extreme Large Terrazzo (Palladiana)**
Terrazzo floor using large stones or pieces with size larger than 35mm. Typical thickness from 15mm or more.
- **LAVASTONE® 415 WCS – Wall and Ceiling Skim-coat**
Render layer for walls and ceilings. Typical thickness from 1mm - 5mm or more.
- **LAVASTONE® 420 RLS – Resurface or Surface Leveler**
Floors are constructed in the form of mortar or dry mortar specifically used in elevation repair or creating new floor surfaces. It is possible to mix with large aggregates, fibers, etc to enhance other properties of the floor. Thickness more than 20mm.
- **LAVASTONE® 425 SFT – Stamped, Formed, Textured Surface**
Shaped, molded, or patterned floor using small aggregates or colors. Typical thickness from 5mm or more.
- **LAVASTONE® 439 SRT – Slip Resistant, Anti-slip**
Anti-slip floor using roughing aggregates to build anti-slip surfaces. Typical thickness from 3mm to 9mm or more.
- **LAVASTONE® 435 EAS – Exposed Aggregates w/wo Grinding**
Floor with exposed large aggregates having anti-slip characteristic (like pebble wash) with/ without surface grinding. Typical thickness from 5mm or more.
- **LAVASTONE® 445 TSA – Tiles, Stones Adhesive**
Used as an adhesive layer for tile, stone slabs installation. Typical thickness from 5mm or more.
- **LAVASTONE® 455 OMP – Object Molding or Precast**
Shaped or precast products can be produced in a variety of ways, including by mixing or casting with materials such as fibers, mesh, etc.

Note

Always carefully read the application instructions for the above variant products before applying. Before adding any additional material should always test and do trials before applying on site. As materials in different locations often have different properties that can make a difference on the quality of the final product. There are additional products available to be used with LAVASTONE® 400 Series to improve the waterproofing, antimicrobial, antistatic, color, elasticity or workability time properties.

Other applications not covered by this document may be supplemented or made available upon request.

Disclaimer

The content of this technical data sheet corresponds to the latest developments and our experiences. All information is based on ideal conditions and therefore may not be completely accurate in actual construction. Due to different types of materials, surfaces and actual construction conditions, no guarantees are given for application. In particular, we are not liable for this information or any verbal statements. The only exception is when we can be blamed for willful or negligence in liability. In that case, the customer must prove that he has fully and promptly transmitted all necessary information to GCM Global for examination and resolution. Any other details relating to the construction of our products must be confirmed in writing by GCM Global. The customer must check the suitability of the product for the intended application and purpose. We reserve the right to change the specifications of products due to ongoing development. In addition, our general terms and conditions are valid. This product documentation supersedes all previous technical data on this product. Technical Data Sheet can be found on our page at www.LAVASTONE.world.



GCM GLOBAL JSC

Floor 12th, LICOGI 13 TOWER, 164 Khuat Duy Tien street, Thanh Xuan district
Ha Noi, Vietnam

support@LAVASTONE.world
www.LAVASTONE.world



Licence Number
11183/01.02.17