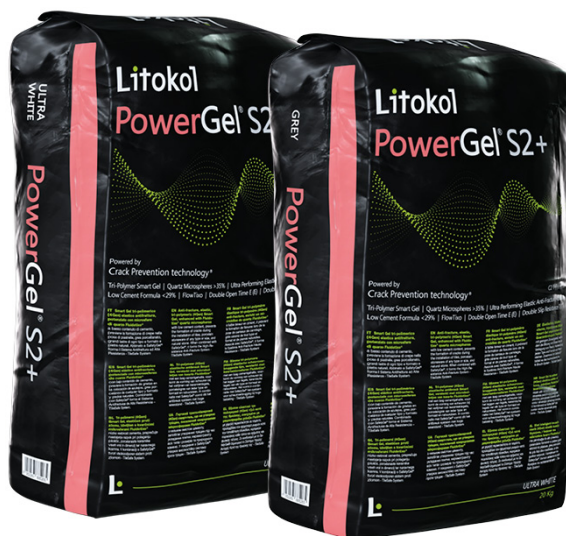

PowerGel® S2+

Technical Specifications



Elastic, crack-resistant tri-polymer Smart Gel (4Gen), reinforced with quartz microspheres, and low-cement-content Fluidotixo® - C5, prevents the formation of cracks when laying tiles, porcelain stoneware, large slabs of all types and sizes, and natural stone. Together with SafetyGel®, it forms the High-Adhesion Anti-Crack System – TileSafe® System.

Product description

Tri-polymeric Smart Gel (4th generation), an elastic, crack-resistant adhesive with an exclusive Fluidotixo® Anti-Fatigue formulation, enhanced with quartz microspheres and formulated with a low cement content (<29%), prevents the formation of cracks when laying tiles, porcelain stoneware, large slabs of all types and sizes, and natural stone, both indoors and outdoors.

Designed for high application safety and thanks to state-of-the-art features, the mixture is extremely creamy, fluid and thixotropic; it maintains its shape and thickness on both floors and walls with 100% wetting power, achieving a double vertical slip resistance rating of T (T) and an open time exceeding 60 minutes (E).

PowerGel® S2+ develops ultra-high-performance, elastic, crack-resistant adhesion thanks to the synergy between the tri-polymer system and the quartz microspheres.

This advanced interaction enables PowerGel® S2+ to guarantee high performance even on difficult substrates with potential dimensional instability or subject to high stresses, such as overlays on old floors, underfloor heating systems, balconies, terraces, swimming pools and façades, where temperature fluctuations – even extreme ones – humidity and high mechanical stresses make adhesion conditions critical.

Classified as C2TE S2 – EN 12004

TileSafe® System

PowerGel® S2+, combined with SafetyGel®, forms the High-Adhesion Anti-Fracture System – TileSafe® System – engineered for the installation of large-format tiles and slabs of any type and size in high-traffic areas, even on cracked substrates (up to 3 mm). The system helps to dissipate and neutralise substrate movements and tile expansion, whilst distributing heavy loads evenly without causing stress.

Gel formula with a patent application filed

PowerGel® S2+ and the TileSafe® System are highly innovative Litokol inventions with international patent applications filed: IT No. 102025000025369 – IT No. 102025000025363

Integrated with diverse polymers

Low Portland cement content <29%

Hybrid engineered hydraulic binders

Enhanced with quartz microspheres > 35%

Calcium silicate gel

Latest-generation cellulose under our own licence

High mineral aggregate content

PowerGel® S2+ embodies Litokol's ongoing scientific progress.

It is designed using innovative raw materials to improve the installation experience, enhance safety and reduce environmental impact.

Supplied by

Crack Prevention® technology

Bond Strength – Ultra-high-performance elastic, crack-resistant

Mix classification

Mix Class	Level of smoothness	Lightness index
C1 – Thick / Paste-like	Requires more force to apply	Standard
C2 – Medium Consistency	It does not run and offers good workability	Standard
C3 - Fluidotixo	Slippery and thixotropic	Light
C4 - Fluidotixo Dinamico	Highly flowable and thixotropic	Light
C5 - Fluidotixo Anti-Fatigue	Ultra-smooth and thixotropic	Ultra Light

Gel Performance Fluidotixo Mix

Class 5 – Fluidotixo® Anti-Fatigue Mix

Fluidotixo® Anti-Fatigue Compound - Ultra-smooth, thixotropic and ultra-lightweight: its extremely fluid consistency makes it easy to apply, whilst maintaining its shape and thickness without running. Designed with high-tech materials (quartz microspheres), the compound spreads with minimal effort, making the gel ideal for prolonged application over large areas.

The Fluidotixo® mixture has gel-like rheological properties, characterised by an initially thixotropic consistency which, under mechanical action (trowelling), reduces its viscosity, becoming temporarily more fluid.

This pseudoplastic behaviour allows for precise and highly fluid application, with superior adhesion to the substrate.

The Fluidotixo® Antifatica compound has an extremely low apparent

viscosity, which promotes exceptional fluidity under the trowel and 100% wettability.

Designed for professional installers, the same mixture offers exceptional spreadability and reduces fatigue during prolonged laying of floor and wall tiles. Once applied, its thixotropic formula ensures that the shape and thickness remain unchanged, without sagging, on both floors and walls, guaranteeing precise and controlled installation without vertical slippage, achieving a double slip resistance rating of T (T).

The advanced performance characteristics of PowerGel® S2+ allow for adjustments even several minutes after application, achieving a double extended open time E (E).

Double Open Time E (E)

PowerGel® S2+ is modified using dual-open-time technology based on an innovative blend of quartz microspheres and latest-generation modified cellulose, developed under Litokol's own licence.

The system regulates wettability in two stages: it maintains and extends the active adhesion window and reactivates it under pressure from the tile for over 60 minutes, allowing more time for laying, correcting and adjusting, even under challenging conditions.

Ideal for laying large-format tiles over extensive areas, in hot climates and on low-absorption surfaces.

Double Slip Resistance T (T)

PowerGel® S2+ is formulated with an innovative blend of latest-generation modified cellulose. Designed for wall applications, it features dual slip resistance: maximum stability of the mixture after application with no sagging, and enhanced adhesion under pressure, preventing the tile from slipping.

The role of advanced cellulose compounds in anti-slip performance is fundamental to developing a static grip effect and activating an elastic memory that locks the tile in place immediately after application, allowing for precision adjustments without compromising adhesion.

Consistent performance, even with heavy formats or in critical environmental conditions.

Gel Performance Adhesive Interface

Tri-Polymer Smart Gel

Latest-generation high-tech gel designed to create an active, elastic and durable interface between materials of different types.

The triple polymer matrix works synergistically to ensure permanent chemical-mechanical adhesion, controlled elasticity and an integrated anti-fracture effect.

The Fluidotixo® rheology allows for dynamic application: fluid under load, stable during application. The quartz microspheres reinforce the ITZ (Interfacial Transition Zone), transforming it into a monolithic elastic zone capable of absorbing movement, mechanical shocks and thermal variations without the propagation of cracks.

Smart Gel – Crack Prevention® Technology

Crack Prevention® technology is a molecular platform integrated into the gel, designed to:

1. To absorb and dissipate mechanical energy prior to failure.
2. To stabilise the gel's internal microstructure under dynamic stress.
3. Prevent the initiation and propagation of micro-cracks in the bonded area.

This technology is activated in real time during the various stages of the system's life cycle: hydraulic shrinkage of the concrete, sudden thermal

shocks, and cyclic stresses (vibrations, deflections, differential movements, thermal expansion or micro-movements of the substrate).

Smart Gel – Mechanism of Action

1. Tri-polymer elastic mesh: compensates for movements in the cladding in an elastic and cohesive manner.
2. Polymerised quartz microspheres: these manage internal stress and optimise the dimensional stability of the bonding bed.
3. Integrated Crack Prevention® modules: these dissipate peak energy and prevent the propagation of cracks in the adhesive matrix.
4. ITZ stabilisation: the contact zone between the back of the tile, the gel and the substrate becomes monolithic and elastic, capable of working in sync with the SafetyGel® membrane.

Anti-Crack System – TileSafe® System

In critical environments or on substrates subject to differential movement, thermal shock, vibrations and structural deformation, simple adhesion is not sufficient: a system is required that can prevent the initiation and propagation of cracks that would damage the tiles. The High-Adhesion Anti-Fracture System comprises two different technologies:

1. SafetyGel® – a 6-dimensional elastic anti-fracture membrane, capable of absorbing and compensating for movements in all six spatial directions before they are transmitted to the cladding.
2. PowerGel® S2+ – a smart, elastic, crack-resistant tri-polymer gel, enhanced with Crack Prevention® technology, capable of protecting the internal bond area from micro-cracks and mechanical stress.

Acts as a smart structural interface, protecting the adhesive transition zone (ITZ) and promoting a flexible, long-lasting bond.

Together, these two elements form an active integrated system that operates by adhesion: the interaction between the two technologies drastically reduces stress concentration, prevents the vertical and lateral propagation of micro-cracks, and increases the mechanical durability of the cladding system.

SafetyGel® and PowerGel® S2+ are not two separate products, but a co-engineered system that takes installation to a new level of reliability. A single resilient, adaptive and monolithic surface, capable of preventing cracks, managing stress and lasting over time.

Tensile bond strength of the TileSafe® System > 1.8 N/mm² in accordance with EN 14891

Direct Technological Benefits

1. SafetyGel® + PowerGel® S2+ synergistic system: maximum multi-directional fracture protection.
2. Active crack prevention – slowing down their propagation.
3. ITZ stability – monolithic and dynamic adhesion on difficult surfaces.
4. Advanced structural elasticity – adapts to movement without compromising adhesion performance.
5. Durability even under extreme conditions – freeze/thaw cycles, internal thermal shocks, vibrations, heavy loads.
6. Ideal for large sheets – resistant to bending, tensile stress, shearing and deformation.

Gel Performance Safety

Security – Level 4

Thanks to Crack Prevention® technology, it is possible to achieve an elastic, crack-resistant bond that develops as the gel cures and is maintained over time, increasing the durability of the Interfacial Transition Zone (ITZ) and protecting it from tensile, compressive and shear stresses.

This elastic adhesion makes PowerGel® S2+ particularly suitable for

applications on underfloor heating systems, swimming pools, outdoor areas and façades, with tiles of any type and size.

The elastic, crack-resistant bond allows PowerGel® S2+ to be applied even on cracked and/or varied substrates (in combination with SafetyGel®), where expansion and shear stresses are more intense and where the risk of cracking is greater.

Chemistry + Smart

Low Portland cement content <29%
Very low emissions of volatile organic compounds (VOCs)

Certifications

EN 12004
EN 12002
ANSI A 118.12
ISO 13007
MED 2014/90/EU
EC1 Plus Gev Eimcode
A+ Indoor air emissions
EPD Environmental Product Declaration

PowerGel® S2+ and the environment

LCA results for Global Warming Potential – Greenhouse Gases (GWP-GHG)								
Impact category	Unit	A1–A3	C1	C2	C3	C4	D	
Climate change GWP-GHG	kg CO ₂ eq	6,05 10 ⁻¹	1,70 10 ⁻³	1,63 10 ⁻²	5,28 10 ⁻⁴	2,93 10 ⁻³	-4,07 10 ⁻³	

Materials

Porcelain stoneware
Ceramic tiles
Large formats, including thin tiles
Laminated stoneware slabs
Mesh-backed porcelain stoneware slabs
Marble – Granite – Stone materials
Natural stone
Ceramic and glass mosaics
Terracotta – Klinker
Resin- or cement-based composites
Insulating and sound-absorbing panels for interiors

Substrates

SafetyGel®
Screeds
Self-levelling compounds
Levelling compounds
Plaster
Plasterboard
Plaster and anhydrite
Existing tiles
Radiant heating systems

Waterproofing products
Decoupling membranes
Aerated concrete
Fibre-cement sheets
Concrete

Uses

Adhesive – levelling compound
Floors – walls
Interior – exterior
Overlay
Radiant heating systems
Indoor wet areas – bathrooms and showers
Pools, swimming pools and fountains
Terraces and balconies
SPA and Hammam
Facades
Industrial flooring
Residential, public, commercial and street furniture
Areas subject to heavy footfall and high stress
Approved for marine use in accordance with the MED Directive 2014/90/EU

In combination with SafetyGel® indoors

Cracked substrates
New, uncured substrates or substrates of a different nature
Change to a different laying pattern or tile size
Installation near thresholds
Installation over utility trenches
Installation near expansion joints – partitioning (in combination with SafetyTex Anti-Fracture)

In combination with SafetyGel® and SafetyTex Anti-Fracture for external use

Cracked substrates
New, uncured substrates or substrates of a different nature
Change to a different laying pattern or tile size
Installation near thresholds
Installation over utility trenches
Installation near expansion joints – partition joints

Limitations

Refer to national standards, such as UNI 11493
Ensure a full bed outdoors or under high loads
Protect the tiled surface from heavy rain for at least 24 hours
Temperature, ventilation, substrate absorption and installation material may affect the workability and setting times of the gel
Do not add water to the mix once it has started to set
Do not use on concrete that has not been adequately cured
Do not use on gypsum- or anhydrite-based substrates without first applying X-Prime®
Do not use on timber or wood-based composites
Do not use on metal, rubber, PVC or linoleum surfaces
Do not use where the surface needs to be ready for foot traffic quickly
Do not use on organic reactive waterproofing membranes (type RM according to EN 14891)

Product specifications

Appearance	Hydrolysed gel powder
Colour	Ultra White – Grey
Responsible Packaging	20 kg recyclable bag
Storage	12 months in original packaging in a dry place
Customs heading	38245090

Technical Specifications

Compliance	EN 12004 – ISO 13007	C2 TE S2
Initial bond strength after 28 days	≥ 1.0 N/mm ²	EN 1348
Adhesion after immersion in water	≥ 1.0 N/mm ²	EN 1348
Adhesion following heat exposure	≥ 1.0 N/mm ²	EN 1348
Adhesion after freeze-thaw cycles	≥ 1.0 N/mm ²	EN 1348
Open time	≥ 0.5 N/mm ² after 30 minutes	EN 1346
Slip	≤ 0.5 mm	EN 1308
Transverse deformation	> 5 mm – < 8 mm	EN 12002
Moisture resistance	Excellent	
Alkali resistance	Excellent	
Solvent resistance	Excellent	
Acid resistance	Low	
pH of the mixture	13	
Specific gravity	1.45 kg/dm ³	
Compliance		ANSI A118.12
- SafetyGel® + PowerGel® S2+	≥ 1/16"	Standard
	≥ 1.6 mm	Performance

Application Specifications

Mix class	Class 5 - Fluidotixo Anti-Fatigue
Preparation of grey gel mixture	Water = 24–27% ~ 4.8–5.4 l / 20 kg
Preparation of Ultra White Gel mixture	Water = 25–28% ~ 5.0–5.6 l / 20 kg
Dough proving time	5 mins
Pot life	6–8 h
Applicable thicknesses	From 1 to 20 mm
Open time	> 60 min
Recording time	> 60 minutes
Application	Notched trowel suitable for the tile size and substrate
Application temperatures	From +5°C to +35°C
Drying time for grouting	Wall: 3 hours – Floor: 12 hours
Ready for foot traffic	12 hours
Commissioning	5 days – Swimming pools 14 days
Operating temperature	From -40°C to +90°C
Cleaning of equipment	With water when the product is fresh. Mechanically once the product has hardened.
Coverage	3,5 mm notched trowel: ~ 1,1 kg/m ²
Coverage	6 mm notched trowel: ~ 1,8 kg/m ²
Coverage	8 mm notched trowel: ~ 2,4 kg/m ²
Coverage	10 mm notched trowel: ~ 3 kg/m ²
Notes	Data recorded at a temperature of +23 °C, 50% RH and in the absence of ventilation. These may vary depending on

specific site conditions.

Preparation of substrates

In accordance with standard UNI 11493-1, substrates must be mechanically sound and free from crumbly parts, grease, oil, paint, wax and rising damp. Cement-based plasters must be allowed to cure for at least one week per centimetre of thickness.

Cement-based screeds must have a total curing time of at least 28 days or be laid using the innovative X-Floor and X-Floor Pro crack-resistant screeds. Create gradients on balconies or pavements using the new-generation crack-resistant levelling compound HydroLevel® 1-30.

Dusty, porous and absorbent substrates must be treated with X-Prime®, an innovative fixative and consolidant.

Smooth, compact substrates, such as trowelled concrete, old ceramic tiles or terrazzo tiles, must be treated with the latest-generation adhesion promoters X-Activator® or X-Activator® Grip after thorough cleaning with the specific detergent X-Cleaner® Scrub.

In the case of anhydrite screeds, ensure that a suitable vapour barrier is in place to prevent any rising damp.

Check using a carbide hygrometer that the residual moisture content is less than 0.5% and 0.3% for underfloor heating screeds.

The surface must be sanded and primed with X-Prime®.

Any cracks or fissures must be sealed with CrackRepair.

In any case, it is essential to consult the relevant technical data sheets to ensure the correct use of the products indicated.

Preparation of the mix

To fully appreciate the superior flow properties and thixotropy of the innovative Fluidotixo® Antifatica Gel compound, we recommend mixing the product using the specified mixing ratio.

Pour the correct amount of water into a container and slowly add the product, mixing with a mechanical mixer until a creamy, homogeneous mixture free from lumps is obtained.

Leave the mixture to rest for about 5 minutes, during which time the polymeric gel develops fully: the hydraulic binders, fillers and cellulose hydrate uniformly, the micro-air bubbles incorporated during mixing are eliminated and the polymers begin the activation process.

Stir briefly to achieve the ultra-smooth, thixotropic, ultra-light Fluidotixo® Anti-Fatigue gel consistency, which is easy to apply to both floors and walls.

Application

To ensure the gel adheres perfectly to the substrate, apply a thin, even coat of the mixture using the smooth side of the trowel and, immediately afterwards, apply the desired thickness using the notched side.

The notching of the trowel must be chosen according to the size of the material to be laid and the substrate.

In accordance with the UNI 11493-1 standard, use the double-coating technique, applying the gel to the back of the tiles as well to ensure complete wetting during installation outdoors, in swimming pools, on façades or in areas subject to particularly high stress.

To ensure complete transfer of the gel to the back of the tiles, they must be laid onto the still-fresh adhesive whilst applying adequate pressure.

The open time under standard temperature and humidity conditions is approximately 60 minutes.

Very hot or windy conditions, or highly absorbent substrates, can drastically

reduce this to just a few minutes; it is therefore advisable to check frequently that the adhesive has not formed a surface film.

In accordance with the UNI 11493-1 standard, tiles must be laid with joints of a width appropriate to their size.

Take account of any partition or structural joints and provide suitable expansion, partition and perimeter joints.

Special Applications

TileSafe® System

Indoor application To install the High-Adhesion Anti-Fracture System indoors, apply SafetyGel® as a “High-Adhesion Anti-Fracture Gel Safety Membrane” (see the SafetyGel® technical data sheet).

Once the final coat of SafetyGel® has dried completely, apply a primer coat of PowerGel® S2+ using the smooth side of the trowel and, immediately afterwards, apply the desired thickness using the notched side. (For applications on expansion or partition joints, use SafetyTex Anti-Fracture as for external applications)

Outdoor application To install the High-Adhesion Anti-Fracture System outdoors, embed the SafetyTex Anti-Fracture membrane in the first fresh coat of SafetyGel®, applied as a ‘High-Adhesion Anti-Fracture Gel Safety Membrane’ (see SafetyGel® technical data sheet).

Once the final coat of SafetyGel® has dried completely, apply a primer coat of PowerGel® S2+ using the smooth side of the trowel and, immediately afterwards, apply the desired thickness using the notched side.

Marble, Natural Stone and Recomposed Stone

Materials prone to deformation or staining due to water absorption require a hydro-curing gel with accelerated adhesion and fast setting, such as FastGel® or FastGel® S1+ (C2F – EN 12004), or a reactive gel such as PowerGel® Pro, FastGel® Pro or PowerGel® Pro Max (R2 – EN 12004).

Even marbles and natural stones of the same type can have different characteristics.

If in doubt, we recommend consulting Litokol’s Technical Customer Service in advance for detailed information or to carry out a laboratory test.

Natural stone slabs with reinforcing layers applied to the back (resins, reinforcing mesh, etc.) or specific treatments (e.g. anti-rising damp, etc.) require a compatibility test with the adhesive, unless otherwise specified by the manufacturer.

Before installation, check for any traces of dust or debris on the back of the slabs.

If this occurs, they must be removed.

Radiant Heating Systems

At least 4 days after laying the X-Floor® or X-Floor® Pro anti-crack screed, you can start up the heating system with a supply water temperature ranging from +20°C to +25°C, maintaining it at a constant level for at least 3 days.

Next, set the maximum design temperature and maintain it for a further 4 days.

At the end of this cycle, allow the screed to return to room temperature and lay the covering (EN 1264-4).

Swimming pools

In accordance with standard UNI 11493 – 7.13.3, swimming pool tiling must be designed taking into account mechanical, thermo-hygrometric and chemical stresses: continuous contact with chemically treated water (even during the winter season) and frequent sanitisation procedures.

In concrete structures, the correct composition must be ensured (UNI 11104 – EN 206) and the correct curing time observed (minimum 6 months, UNI 11493 - 7.3.1).

It is essential to waterproof the external part of the structure, taking

preventive measures to avoid any infiltration that could cause the waterproofing membrane applied inside the tank to detach, such as drainage along the sides of excavations or waterproofing using osmotic mortars. Grind and level surfaces with HydroLevel®, a quartz-reinforced structural levelling compound with controlled expansion and crack-resistant properties. Waterproof the pool surfaces using the watertight, crack-resistant SafetyGel® elastic gel membrane with 6-Dimensional Elasticity technology, or the breathable, tripolymer waterproof gels enhanced with quartz microspheres from the HydroPad® range featuring 4-Way Flex technology. Seal critical areas such as construction joints with HydroStop, and pipes passing through recirculation, filtration, drainage and lighting systems with HydroPixel®.

We recommend carrying out a water-tightness test before laying the cladding.

Always apply gel to the back of the material as well (double coating) to ensure a full bed of adhesive, guaranteeing full force transfer and the durability of the system.

Facades

When installing on external walls ($H > 3$ m), as these are tiled surfaces subject to high dilatometric stresses due to thermal and hygrometric variations, and given the safety risk associated with potential detachment, it is recommended to consult Litokol's Technical Customer Service in advance in order to accurately identify the safest installation technique.

In accordance with standard UNI 11493 – 7.13.7, the following general guidelines must be followed: the substrate must ensure a cohesive tensile strength of $\geq 1.0 \text{ N/mm}^2$.

In the case of masonry substrates consisting of bricks/clay blocks, lightweight blocks, etc., direct application is not permitted; instead, application onto plaster in accordance with the above instructions is required.

For cladding with a side length > 30 cm, the designer must assess whether it is necessary to specify suitable mechanical safety fixings.

Separation and expansion joints must be provided as specified in sections 7.11.1.2 and 7.11.1.3.

Always apply adhesive to the back of the material as well (double coating) in order to achieve a full bed of adhesive, ensure full force transfer and guarantee the durability of the system.

Grouting, sealing and maintenance

For grouting, X-Color® 0-6 or X-Color® 2-12 decorative grouts can be used. To create waterproof joints with high colour fastness and superior chemical and mechanical resistance, use the decorative epoxy gels from the Starlike® range.

For the elastic sealing of expansion joints, partition joints and perimeter joints, use sealants from the Pixel 3D range.

For post-construction washing, cleaning, maintenance and surface protection, use the specific Litokol detergents from the X-Cleaner and Starlike® Care ranges.

Warnings

Due to the high content of adhesive polymers, it is recommended to wash tools and remove any product residue from surfaces with water before the Gel sets.

Once the reaction is complete and the gel has hardened, it can only be removed mechanically.

Safety Information

For the safe use of our products, please refer to the latest version of the Safety Data Sheet, available at www.litokol.com
PRODUCT FOR PROFESSIONAL USE

Legal notices

The information and specifications set out in this technical data sheet are based on our best experience.

However, as we are unable to directly influence site conditions or the execution of the works, these are general guidelines which do not in any way bind our Company.

We therefore recommend carrying out a preliminary test to verify the product's suitability for the intended use; in any case, anyone intending to use it is required to determine whether or not it is suitable for the intended use and, in any event, assumes all liability that may arise from its use.

Always refer to the latest updated version of the Technical Data Sheet, available on the website www.litokol.com

Specification item

Installation indoors and outdoors in accordance with UNI standards 11493-1 and 11714-1 of ceramic floor and wall tiles of all types – porcelain stoneware, single-fired, double-fired, clinker and terracotta – dimensionally stable stone materials that are not susceptible to staining, and mosaics – will be carried out using fourth-generation, elastic, crack-resistant tri-polymeric Smart Gel, reinforced with quartz microspheres, formulated with a low cement content (<29%), fluid and thixotropic, maintaining a constant shape and thickness on both floors and walls with 100% wetting power, resistant to vertical slippage and featuring an extended open time of over 60 minutes, classified as C2TES2 in accordance with standard EN 12004, type PowerGel® S2+ by Litokol Lab SpA.

Product details **No. 044**
Revision **No. 4**
Date: **09 26**

Litokol

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