



Planitop[®] 18 ES

**Rapid-Setting Repair Mortar
with Extended Working Time**



Meets requirements for ASTM C928 R3 mortar



DESCRIPTION

Planitop 18 ES is a one-component, high-early-strength, cementitious repair mortar, with a corrosion inhibitor, that has the rapid-setting characteristics of *Planitop 18* but with an extended set and working time. It is suited for all interior/exterior horizontal concrete repairs both below- and above-grade, including bridge-deck repairs, parking-garage floor repairs and ramps. *Planitop 18 ES* provides a dense, impermeable pore structure and a high-strength, durable repair mortar.

FEATURES AND BENEFITS

- Rapid-setting repair mortar meets requirements for ASTM C928 R3 mortar
- Open to vehicular traffic in 6 hours at 73°F (23°C)
- Easy to use, requiring only the addition of potable mixing water
- Extended working time for hot-weather applications
- Strong bond to old concrete surfaces, and good resistance to freeze/thaw cycles and de-icing salts
- Trowelable mortar can be extended up to 50% by weight with 3/8" (10 mm) pea gravel for thicknesses up to 6" (15 cm)
- Formulated with low chloride permeability (low coulombs) to protect embedded steel against corrosion
- May be coated as early as 6 hours at 73°F (23°C) with non-breathable coatings, such as epoxies

INDUSTRY STANDARDS AND APPROVALS

- Meets or exceeds requirements for ASTM C928 R3 mortar
- | | |
|--|--------------------|
| <u>LEED Points Contribution</u> | <u>LEED Points</u> |
| MR Credit 5, Regional Materials* | Up to 2 points |

** Using this product may help contribute to LEED certification of projects in the categories shown above. Points are awarded based on contributions of all project materials.*

WHERE TO USE

- For horizontal, interior/exterior, structural concrete repairs, above- and below-grade, from 1/4" to 1" (6 mm to 2,5 cm) thickness neat and up to 6" (15 cm) extended
- For repairing concrete structures such as airport runways, balconies, bridge and parking decks, warehouse and manufacturing floors, concrete pavement, driveways and tunnels
- For repairing concrete surfaces subject to extreme exposure and heavy vehicular traffic, including road and ramp repairs, industrial floors, piers, restoration of joint headers on warehouse slabs, sidewalks and canals

LIMITATIONS

- Use at ambient temperatures between 45°F and 95°F (7°C and 35°C). For temperatures above 95°F (35°C), use hot-weather guidelines from the American Concrete Institute (ACI). For temperatures below 45°F (7°C), use ACI's guidelines for cold-weather applications.



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- When using *Planibond*[®] 3C as a bonding agent for horizontal repairs with *Planitop 18 ES*, mix and apply *Planibond 3C*, and then let it cure for 24 hours before mixing and applying the repair mortar.
- Protect from freeze/thaw for 24 hours after application.
- For vehicular traffic, maintain a repair depth of at least 1/2" (12 mm).
- Consult with the coatings manufacturer and conduct on-site testing before application of epoxy coatings.

SUITABLE SUBSTRATES

- Properly prepared, structurally sound, fully cured concrete substrates (at least 28 days old)

Consult MAPEI's Technical Services Department for installation recommendations regarding substrates and conditions not listed.

SURFACE PREPARATION

- Ensure that all substrates are clean, structurally sound and stable.
- Thoroughly clean surfaces of substances that could affect the bond strength of *Planitop 18 ES*, including dust, dirt, paint, tar, asphalt, wax, oil, grease, sealers, primers, form-release agents, laitance, loose particles, foreign substances and any other residues that could reduce or impair adhesion.
- Mechanically profile and prepare concrete surfaces by shotblasting, abrasive blasting, waterjetting, scarifying or other engineer-approved methods, allowing a minimum clearance of 3/4" (19 mm) clearance behind reinforcing steel. Reference ICRI CSP Standards ≥ 5 for acceptable profile.
- Reference International Concrete Repair Institute (ICRI) Technical Guideline #310.1R-2008 and ACI RAP Bulletin 7 for repair geometry, surface preparation and material application details.
- Ensure that the concrete substrate, material and ambient temperatures are between 45°F and 95°F (7°C and 35°C) before application. Maintain temperatures within this range for at least 12 hours after installation of *Planitop 18 ES*.
- Ensure that the concrete substrate is saturated surface-dry (SSD) before installation of *Planitop 18 ES*. The concrete surface should be free of any standing water.

MIXING

Note: Choose all appropriate safety equipment before use. Refer to the Safety Data Sheet for more information.

1. Into a clean mixing container, pour 2.75 U.S. qts. (2,60 L) of cool, clean, potable water, not to exceed 2.88 U.S. qts. (2,73 L) per 50-lb. (22,7-kg) bag to achieve desired consistency.

2. For best results, mix *Planitop 18 ES* by using a mortar mixer, although it may also be drill-mixed. Slowly add *Planitop 18 ES* to water while mixing. If drill mixing, use a low-speed drill and Jiffy mixer. Mix for 2 to 3 minutes to a smooth, homogenous consistency.
3. For an extended mix, add up to 50% by weight (25 lbs. [11,3 kg]) of clean, washed, SSD 3/8" (10 mm) pea gravel per 50-lb. (22,7-kg) bag.
4. Avoid overmixing, or moving the mixer up and down during the mixing process, as it could shorten pot life.
5. Mix only the amount of material that can be applied within 30 minutes.

PRODUCT APPLICATION

1. Read all application instructions thoroughly before installation.
2. Clean all exposed reinforcement steel and coat with *Mapefer*[™] 1K or *Planibond 3C* to protect against corrosion (see the respective Technical Data Sheet for details).
3. Apply with a float or screed on horizontal surfaces to a thickness of no more than 1" (2,5 cm) neat per lift or up to 6" (15 cm) extended.
4. Place *Planitop 18 ES* within the established pot life, which is about 30 minutes at 73°F (23°C). Application times will vary depending on climatic conditions.

CURING

1. During curing, protect *Planitop 18 ES* from excessive heat and high wind conditions.
2. In hot and windy conditions, damp burlap, white polyethylene sheeting or a suitable water-based or solvent-based curing compound may be used. Note: Remove form-release agent and/or curing compound before covering the surface with a coating.

CLEANUP

Wash hands and tools promptly with water before material hardens. Cured material must be mechanically removed.

Product Performance Properties

Laboratory Tests	Results			
	41°F (5°C)	73°F (23°C)	95°F (35°C)	ASTM C928 (R3)
Compressive strength – ASTM C109 (CAN/CSA-A5)				
3 hours	≥ 3,000 psi (20,7 MPa)	> 3,500 psi (24,1 MPa)	> 3,500 psi (24,1 MPa)	≥ 3,000 psi (20,7 MPa)
1 day	≥ 5,000 psi (34,5 MPa)	> 5,000 psi (34,5 MPa)	> 5,000 psi (34,5 MPa)	≥ 5,000 psi (34,5 MPa)
7 days	≥ 5,000 psi (34,5 MPa)	> 5,500 psi (37,9 MPa)	> 5,500 psi (37,9 MPa)	≥ 5,000 psi (34,5 MPa)
28 days	≥ 5,000 psi (34,5 MPa)	> 7,000 psi (48,3 MPa)	> 7,000 psi (48,3 MPa)	≥ 5,000 psi (34,5 MPa)
Compressive strength – ASTM C39				
28 days	> 5,000 psi (34,5 MPa)	> 6,000 psi (41,4 MPa)	> 6,000 psi (41,4 MPa)	N/A
Consistency @ 5 minutes (ASTM C109)	≥ 100%	≥ 100%	≥ 100%	≥ 100%
Flexural strength – ASTM C348 (CAN/CSA-A23.2-8C)				
28 days	> 820 psi (5,66 MPa)	> 1,000 psi (6,9 MPa)	> 1,000 psi (6,9 MPa)	N/A
Slant/shear bond strength – ASTM C882 (modified)				
1 day	> 1,000 psi (6,90 MPa)	> 1,800 psi (12,4 MPa)	> 1,800 psi (12,4 MPa)	> 1,000 psi (6,90 MPa)
7 days	> 1,000 psi (6,90 MPa)	> 2,500 psi (17,2 MPa)	> 2,500 psi (17,2 MPa)	> 1,000 psi (6,90 MPa)
Length change – ASTM C157 (modified)				
28 days (water)	≤ + 0.15%	≤ + 0.15%	≤ + 0.15%	≤ + 0.15%
28 days (air)	≤ - 0.15%	≤ - 0.15%	≤ - 0.15%	≤ - 0.15%
Splitting tensile strength – ASTM C496				
1 day	400 psi (2,76 MPa)	> 400 psi (2,76 MPa)	> 400 psi (2,76 MPa)	N/A
28 days	450 psi (3,10 MPa)	> 600 psi (4,14 MPa)	> 600 psi (4,14 MPa)	N/A
Freeze/thaw resistance at 300 cycles (ASTM C666)	98%	98%	98%	N/A
Rapid chloride permeability (ASTM C1202)				
28 days	< 1,000 coulombs	< 1,000 coulombs	< 1,000 coulombs	N/A
Scaling resistance at 25 cycles – (ASTM C672)	0 rating; no scaling	0 rating; no scaling	0 rating; no scaling	≤ 1 lb. per sq. ft. = .004788 N/cm ²

Shelf Life and Application Properties (before mixing)

Shelf life	1 year in original bag, in dry, heated, covered and well-ventilated place
Physical state	Powder
Color	Gray

Protect containers from freezing in transit and storage. Provide for heated storage on site and deliver all materials at least 24 hours before work begins.

Application Properties (mixed)

Laboratory Tests	Results
Mixing ratio	2.88 U.S. qts. (2,73 L) of water per 50-lb. (22,7-kg) bag
Consistency of mix	Trowelable mortar
Application temperature range	45°F to 95°F (7°C to 35°C)
Set time (ASTM C191)*	
Initial	35 to 80 minutes
Final	40 to 100 minutes

* Set times are dependent on substrate temperatures and placement conditions.

Planitop[®] 18 ES



CSI Division Classifications

Cast-in-Place Concrete	033000
Cementitious Decks and Underlayment	035000

Packaging

Product Code	Size
17250	Bag: 50 lbs. (22,7 kg)

Approximate Coverage*

Size	Yield
Per 50-lb. (22,7-kg) bag, neat	0.41 cu. ft. (0,0116 m ³)
Per 50-lb. (22,7-kg) bag, extended 50% with 25 lbs. (11,3 kg) of 3/8" (10 mm) pea gravel	0.51 cu. ft. (0,0144 m ³)

* Coverage shown is for estimating purposes only. Actual jobsite coverage may vary according to climate and substrate conditions.

Refer to the SDS for specific data related to VOCs, health and safety, and handling of product.

STATEMENT OF RESPONSIBILITY

Before using, user shall determine the suitability of the product for its intended use and user alone assumes all risks and liability whatsoever in connection therewith.

ANY CLAIM SHALL BE DEEMED WAIVED UNLESS MADE IN WRITING TO US WITHIN FIFTEEN (15) DAYS FROM DATE IT WAS, OR REASONABLY SHOULD HAVE BEEN, DISCOVERED.

We proudly support the following industry organizations:



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For the most current BEST-BACKED[™] product data and warranty information, visit www.mapei.com.

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