



Planitop[®] 18 ES

**Very Rapid-Hardening
Repair Mortar with Extended
Working Time**



DESCRIPTION

Planitop 18 ES is a one-component, high-early-strength, cementitious repair mortar, with a corrosion inhibitor, that has the very rapid-hardening characteristics of *Planitop 18* but with an extended set and working time.

FEATURES AND BENEFITS

- Very rapid-hardening repair mortar that meets requirements for ASTM C928 R3 mortar
- Open to vehicular traffic in 6 hours at 73°F (23°C)
- Extended working time for hot-weather applications
- 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)
- 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 requirements for ASTM C928 R3 mortar

WHERE TO USE

- Interior and exterior, horizontal concrete surfaces
- 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

Consult MAPEI's Technical Services Department for installation recommendations regarding uses not listed.

SURFACE PREPARATION

- Concrete surface must be clean, sound and free of loose particles, efflorescence, paints, tar, grease, asphaltic materials, bond breakers, curing compounds, wax, and any foreign substance or any conditions that may affect proper bonding of the product and result in cracking, discoloration or changes in overall product performance.
- Mechanically profile and prepare concrete surfaces by engineer-approved methods, allowing a minimum of 3/4" (19 mm) clearance behind reinforcing steel. Reference International Concrete Repair Institute (ICRI) Technical Guideline #310.2R concrete surface profile (CSP) #5 and greater.
- Clean all exposed reinforcement steel and coat with *Mapofer™ 1K* or *Planibond® 3C* to protect against corrosion (see the respective Technical Data Sheet for details).

MIXING

Before product use, take appropriate safety precautions. Refer to the Safety Data Sheet for details.

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, saturated surface-dry (SSD), 3/8" (10 mm) pea gravel per 50-lb. (22.7-kg) bag.

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4. Avoid overmixing, or moving the mixer up and down during the mixing process, as it could shorten the pot life.
5. Mix only the amount of material that can be applied within 30 minutes.

PRODUCT APPLICATION

Read all application instructions thoroughly before installation.

1. Ensure that the concrete substrate is SSD before installation of *Planitop 18 ES*. The concrete surface should be free of any standing water.
2. 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.
3. 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 conditions of excessive heat and high winds.
2. *Planitop 18 ES* must be wet-cured for at least 4 hours. Alternatively, a water-based curing compound conforming to ASTM C308 may be utilized.

CLEANUP

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

LIMITATIONS

- Use at ambient temperatures between 45°F and 95°F (7°C and 35°C). For temperatures below or above this range, use cold- or hot-weather guidelines from the American Concrete Institute (ACI).
- Protect from freeze/thaw for 24 hours after application.
- For vehicular traffic, maintain a repair depth of at least 1/2" (12 mm).
- Do not use *Planibond[®] 3C* as a bonding agent for *Planitop 18 ES*.

Product Performance Properties

Laboratory Tests	Results	
	73°F (23°C)	ASTM C928 (R3)
Compressive strength – ASTM C109 (CAN/CSA-A5)		
3 hours	> 3,000 psi (20.7 MPa)	≥ 3,000 psi (20.7 MPa)
1 day	> 5,000 psi (34.5 MPa)	≥ 5,000 psi (34.5 MPa)
7 days	> 5,500 psi (37.9 MPa)	≥ 5,000 psi (34.5 MPa)
28 days	> 7,000 psi (48.3 MPa)	≥ 5,000 psi (34.5 MPa)
Compressive strength – ASTM C39		
28 days	> 6,000 psi (41.4 MPa)	N/A
Consistency at 5 minutes – ASTM C109*	≥ 100%	≥ 100%
Flexural strength – ASTM C348 (CAN/CSA-A23.2-8C)		
28 days	> 1,000 psi (6.9 MPa)	N/A
Slant/shear bond strength – ASTM C882*		
1 day	> 1,800 psi (12.4 MPa)	> 1,000 psi (6.90 MPa)
7 days	> 2,500 psi (17.2 MPa)	> 1,000 psi (6.90 MPa)
Length change – ASTM C157*		
28 days (water)	≤ + 0.15%	≤ + 0.15%
28 days (air)	≤ -0.15%	≤ -0.15%
Splitting tensile strength – ASTM C496		
1 day	> 400 psi (2.76 MPa)	N/A
28 days	> 600 psi (4.14 MPa)	N/A
Freeze/thaw resistance at 300 cycles – ASTM C666	98%	N/A
Rapid chloride permeability – ASTM C1202		
28 days	< 1,000 coulombs	N/A
Scaling resistance at 25 cycles – ASTM C672	0 rating; no scaling	≤ 1 lb. per sq. ft. = .004788 N/cm ²
VOCs (Rule #1168 of California's SCAQMD)	0 g per L	

* Modified per ASTM C928 testing requirements

Shelf Life and Product Characteristics before mixing

Shelf life	1 year in original unopened packaging in a dry, covered and well-ventilated place at 73°F (23°C)
Physical state	Powder
Color	Gray

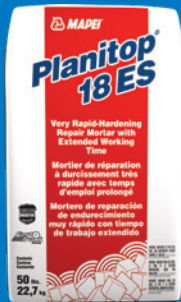
Protect containers from freezing in transit and storage. Provide for heated storage on site and deliver all materials at least 24 hours before work begins.

Application Properties

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	> 45 minutes
Final	< 110 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

Size
Bag: 50 lbs. (22.7 kg)
Bag in pail: 50 lbs. (22.7 kg)

Approximate Coverage* per 50 lbs. (22.7 kg)

Mix	Yield
Neat	0.41 cu. ft. (0.0116 m ³)
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.

RELATED DOCUMENTS

ACI 305R-10 Guide to Hot Weather Concreting
ACI 306R-10 Guide to Cold Weather Concreting
ICRI 310 1R-2008 Guide for Surface Preparation of Deteriorated Concrete Resulting from Reinforcing Steel Corrosion
ICRI 310 2R-2013 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair

Refer to the SDS for specific data related to health and safety as well as product handling.

For information on MAPEI's commitment to sustainability and transparency, as well as how MAPEI products may contribute to green building standards and certification systems, contact sustainability_USA@mapei.com (USA) or sustainability-durabilite@mapei.com (Canada).

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