

SET® 45

Chemical action concrete

DESCRIPTION:

SET® 45 is a one component concrete repair and anchoring material which sets in 15 minutes and takes rubber tire traffic 45 minutes after placement. This product bonds to both concrete and masonry and can be used indoors and outdoors for a variety of highway and heavy industrial repair jobs. It comes in two formulations - **SET 45 Regular** for use in ambient temperatures below 85 °F (29 °C); and **SET 45 Hot Weather** for use in ambient temperatures ranging from 85 °F to 100 °F (29 °C to 38 °C).

Note: Regardless of the temperature, **SET 45 Hot Weather** formula with aggregate should be used for deep placements. Consult your Master Builders representative for further instructions.

RECOMMENDED FOR:

- Bridge deck and highway overlays
- Concrete pavement joint repairs
- Airport runway light installations
- Full depth structural repairs
- Expansion device nosings
- Anchoring iron or steel bridge and balcony railings
- Commercial freezer room repairs
- Truck dock repairs
- Parking deck and ramp repairs
- Heavy industrial repairs

FEATURES/BENEFITS:

- Easy-to-use – just add water
- Wide temperature use range – from below freezing to hot weather exposures
- Rapid, high-early strength – when 2 in. (50 mm) cubes are tested, the results show approximately 2,000 psi (13.8 MPa) compressive strength in one hour
- Superior bonding – no bonding agent is needed
- Resistant to freeze/thaw cycles and deicing chemicals
- Thermal expansion/contraction rate similar to that of plain, portland cement concrete
- Virtually no drying shrinkage
- Only air-curing required

PACKAGING/ESTIMATING:

SET 45 concrete is packaged in 50 lb (22.7 kg) moisture-resistant bags.

A 50 lb (22.7 kg) bag of SET 45 concrete mixed with the required amount of water produces a volume of approximately 0.39 ft³ (0.011 m³). A 60% extension using 1/2 in. (13 mm), rounded, sound aggregate produces a volume of approximately 0.58 ft³ (0.016 m³).

The following information regarding surface preparation, application and curing is provided as a brief overview. For detailed instructions before use of this product, reference the SET 45 product bag.

SURFACE PREPARATION:

A sound base is essential for good repairs. Flush the area with clean water to remove all dust.¹ Air blast with oil-free, compressed air to remove all water before placing SET 45.

APPLICATION:

Use neat material for patches less than 1 in. (25 mm) in depth or width. For deeper patches, a 50 lb (22.7 kg) bag of SET 45 concrete must be extended by adding up to 30 lb (13.6 kg) of properly graded, dust-free, hard, rounded aggregate or non-calcareous crushed angular aggregate not exceeding 1/2 in. per ASTM C 33, #8.² (Do not use calcareous aggregate made from soft limestone. Test aggregate for fizzing in 10% HCL). Mix for approximately 1 to 1-1/2 minutes and place. Regular SET 45 will not freeze at temperatures above 20 °F (-7 °C).

CURING:

SET 45 should air dry for proper cure. Liquid membrane curing compounds or plastic sheeting may be used to give the surface early protection from precipitation, but **never** wet cure SET 45. SET 45 dries to the color of portland cement mortar.

LIMITATIONS:

- Do not add sand, fine aggregate or portland cement to SET 45 concrete.
- Do not use SET 45 for patches less than 1/2 in. (13 mm) deep. For deep patches, SET 45 Hot Weather formula, extended with aggregate, should be used.
- Do not use limestone aggregate.
- Water content is critical. Do not deviate from the recommended water content printed on the bag.
- When mixing or placing SET 45 in a closed area, provide adequate ventilation.
- Do not use SET 45 as a precision, nonshrink grout.
- Never featheredge. For best results, always saw cut the edges of a patch.
- Moisture loss during the first three hours after placement must be avoided. Protect SET 45 with plastic sheeting or curing compound in the event of rapid evaporation conditions. Do not wet cure.
- Do not place SET 45 on a hot [90 ° F (32 ° C)] dry substrate.
- When used in contact with galvanized steel or aluminum, consult your local Master Builders sales representative.

¹ Surface carbonation inhibits chemical bond. Apply an indicator to the prepared surface to determine if carbonation is present.

² Special procedures must be followed when angular aggregate is used. Contact your local Master Builders representative for more information.

PERFORMANCE DATA:

Typical Compressive Strengths: psi (MPa) (Materials and Curing Times at Specified Temperatures)

ASTM C 109 (Modified) [All tests were performed with neat (no aggregate) material.]

	Plain Concrete @ 72 °F (22 °C)	SET 45 Regular @ 72 °F (22 °C)	SET 45 Regular @ 36 °F (2 °C)	Set-45 Hot Weather @ 95 °F (35 °C)
1 hour	—	2,000 (13.8) ³	—	—
3 hour	—	5,000 (34.5)	—	3,000 (20.7)
6 hour	—	5,000 (34.5)	1,200 (8.3)	5,000 (34.5)
1 day	500 (3.5)	6,000 (41.4)	5,000 (34.5)	6,000 (41.4)
3 day	1,900 (13.1)	7,000 (48.3)	7,000 (48.3)	7,000 (48.3)
28 day	4,000 (27.6)	8,500 (58.6)	8,500 (58.6)	8,000 (55.2)

³ Only SET 45 Regular formula, tested at 72 °F (22 °C), obtains 2,000 psi (13.8 MPa) compressive strength in one hour.

Modulus of Elasticity

(ASTM C 469)

psi (MPa)

Age	7 day	28 day
SET 45 Regular	4.18 x 10 ⁶ (2.88 x 10 ⁴)	4.55 x 10 ⁶ (3.14 x 10 ⁴)
SET 45 Hot Weather	4.90 x 10 ⁶ (3.38 x 10 ⁴)	5.25 x 10 ⁶ (3.62 x 10 ⁴)

Freeze/Thaw Durability Test

[ASTM C 666, Procedure A (Modified)*]

Both Regular and Hot Weather SET 45 achieved a Relative Dynamic Modulus greater than 80% after 300 cycles.

Scaling Resistance to Deicing Chemicals

(ASTM C 672)

SET 45 Regular and SET 45 Hot Weather Formulas.
After 5 and 25 cycles at a rating of 0, the surface showed no scaling. After 50 cycles at a rating of 1.5, the surface showed slight scaling.

Sulfate Resistance

(ASTM C 1012)

SET 45 Length change after 52 weeks

SET 45 Type V cement mortar

0.9%

0.20%

Typical Setting Times

[Gillmore ASTM C 266 (Modified)]

SET 45 Regular at 72 °F (22 °C) and SET 45 Hot Weather at 95 °F (35 °C) had the following typical setting times:

Initial — 10 to 15 minutes.

Final — 12 to 20 minutes.

Coefficient of Thermal Expansion⁵

(CRD-C 39-81)

Both SET 45 Regular and SET 45 Hot Weather had coefficients which equaled 7.15 x 10⁻⁶/°F (12.8 x 10⁻⁶/°C).

Flexural Strength

[ASTM C 78 (Modified)]

3 in. x 4 in. x 16 in. (75 mm x 100 mm x 406 mm) prisms -
1 day strength.

SET 45 mortar 550 psi (3.8 MPa)

SET 45 mortar with 3/8 in. (9 mm)
pea gravel 600 psi (4.2 MPa)

SET 45 mortar with 3/8 in. (9 mm) crushed
angular non-calcareous hard aggregate 650 psi (4.5 MPa)

⁴ Method states that test is discontinued when 300 cycles or an RDM of 60% is reached.

⁵ Determined using 1 in. x 1 in. x 11" (25 mm x 25 mm x 279 mm) bars. Test was run with neat mixes (no aggregate). Lower coefficient of thermal expansion results are obtained when extended mixes (with \ aggregate) are used.

RELATED BULLETINS:

Material Safety Data Sheet — SET 45

Specification Bulletin (7S10) — SET 45

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