

MS SELF-CONSOLIDATING CONCRETE

High performance, pre-packaged, self-consolidating concrete repair material.

MS Self-Consolidating Concrete is a pre-blended, pre-packaged, high performance, flowable concrete material containing Portland cement, silica fume, 10 mm (3/8 inch) stone and other carefully selected admixtures.

FEATURES & BENEFITS

- Superior plastic properties provide a fluid mix with self-consolidating characteristics without bleeding or segregation.
- Easily consolidated without rodding or vibrating.
- Air-entrainment provides superior resistance to freeze-thaw cycling and salt scaling in the presence of de-icing salts.
- Excellent pumpability.
- Properties similar to conventional concrete, thus offering excellent compatibility with existing concrete.
- Improved resistance to sulphate attack.
- Very low permeability.
- Low shrinkage.
- Designed with natural normal-density non-reactive fine and coarse aggregates to eliminate potential alkali-aggregate reactivity (AAR).
- All King products are manufactured using ISO 9001:2000 Certified Processes.

USES

Partial depth, formed repairs of concrete beams, columns, soffits, and/or shear walls in bridges, parking garages or other concrete structures.

PROCEDURES

Surface Preparation:

All repair surfaces must be free from dust, oil, grease or any other foreign substances that may interfere with the bond of the material. Remove all delaminated or unsound concrete providing a roughened surface and a minimum of 25 mm (1 inch) clearance behind any corroded reinforcing steel. The perimeter of the repair area should be sawcut a minimum of 20 mm (3/4 inch). Clean the area to be repaired with potable water, leaving the concrete saturated but free of standing water (SSD).

Mixing:

Place 75 % of required potable water into mixer and slowly introduce entire bag of MS Self-Consolidating Concrete. Add balance of required water slowly while mixer is running, not exceeding maximum recommended volume of water. **Maximum recommended volume of water is 3.15 litres (0.83 US gallon) per 30 kg (66 lb.) bag.** Continue mixing for a minimum of 3 minutes and stop only when material has obtained a consistent homogeneous mix.

Restrict mixing time to 2 minutes when using a drill/paddle style mixer.

Placing:

Mix and substrate temperatures should be maintained between 5 and 30°C (40 and 86°F).

Do not place MS Self-Consolidating Concrete when ambient temperature is below 5°C (40°F). Refer to ACI 306, "Cold Weather Concreting".

In warm weather, ice water may be used to cool mix temperature and avoid

short working time. When ambient temperature is above 30°C (86°F), refer to ACI 305, "Hot Weather Concreting".

Gravity feed or pump MS Self-Consolidating Concrete into forms and allow mix to fully encapsulate any existing rebar. Rodding and vibrating of mix is not required. Forms should not be removed until mix has attained 75 % of its 28 day strength. Refer to ACI 347, "Guide to Formwork for Concrete".

Placing (for overhead or vertical pumping applications):

Follow pump manufacturers recommendations for pumping. Formwork should contain drainage outlets for pre-wetting substrate. For soffit repairs, vent holes should be included for air venting. Entry points for MS Self-Consolidating Concrete should not be spaced more than 600 mm (24 inches) apart. An acceptable form release agent should be used for easy removal of forms. Pump mix into forms ensuring that no voids are left in any locations. Forms should not be removed until mix has attained 75 % of its 28 day strength. Refer to ACI 347 "Guide to Formwork for Concrete".

Curing:

Curing is essential to optimize physical properties of the concrete and minimize plastic shrinkage. Curing should begin immediately after forms are removed in accordance with ACI 308 "Guide to Curing Concrete". Moist curing should be conducted for a minimum period of 7 days after placement of MS Self-Consolidating Concrete. Alternatively, moist cure for a minimum period of 24 hours and apply King Duro-Cure curing compound or a curing compound that complies with ASTM C 309. Curing is particularly critical in rapid moisture loss conditions such as high temperatures, direct sun, high winds and low humidity.

TECHNICAL DATA

The following data is representative of typical values achievable under laboratory conditions. Results in the field may vary.

SLUMP FLOW

ASTM C 1611	625 ± 25 mm 24 ± 1 inch(es)
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MASS DENSITY

ASTM C 39	2300 kg/m ³ (143 lb./ft ³)
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COMPRESSIVE STRENGTH

ASTM C 39	
1 Day	10 MPa (1500 psi)
3 Day	25 MPa (3500 psi)
7 Day	30 MPa (4300 psi)
28 Day	40 MPa (5800 psi)

FLEXURAL STRENGTH

ASTM C 78	
7 Day	7.5 MPa (1075 psi)
28 Day	10.5 MPa (1525 psi)

AIR CONTENT

ASTM C 457	7 ± 2 %
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MS SELF-CONSOLIDATING CONCRETE**BOND STRENGTH**

CSA A23.2-6B (MODIFIED)
28 Day 1.5 MPa (215 psi)

BOND STRENGTH BY SLANT SHEAR

ASTM C 882
28 Day 20 MPa (2900 psi)

UNIAXIAL DRYING SHRINKAGE

ASTM C 157
30 Day 400 $\mu\text{m}/\text{m}$

FREEZE-THAW RESISTANCE

ASTM C 666
99 %
(Excellent durability factor)

SALT SCALING RESISTANCE

ASTM C 672
50 cycles 0.03 kg/m^2 (0.006 $\text{lb.}/\text{ft}^2$)

RAPID CHLORIDE PERMEABILITY

ASTM C 1202 750 Coulombs

OPTIMUM PERFORMANCE

- Use MS Self-Consolidating Concrete for closed formed repairs only.

YIELD

30 kg (66 lb.) bag contains approximately 0.014 m^3 (0.5 ft^3).

PACKAGING

MS Self-Consolidating Concrete is normally packaged in 30 kg (66 lb.) triple lined bags and poly wrapped on wooden pallets. All KING products can be custom packaged to suit specific job requirements.

STORAGE AND SHELF LIFE

Material should be stored in a dry covered area protected from the elements. Unopened bags have a shelf life of 12 months.

SAFETY PROCEDURES

MS Self-Consolidating Concrete contains Portland cement. Normal safety-wear such as rubber gloves, dust mask and safety glasses used to handle conventional cement based products should be worn. Material Safety Data Sheets are available upon request.

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This product is designed to meet the performance specifications outlined in this product data sheet. If the product is used in conditions for which it was not intended, or applied in a manner contrary to the written recommendations contained in the product data sheet, the product may not reach such performance specifications. The foregoing is in lieu of any other warranties, representations or conditions, expressed or implied, including, but not limited to, implied warranties or conditions of merchantable quality or fitness for particular purposes, and those arising by statute or otherwise in law or from a course of dealing or usage of trade.

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