

PRODUCT NAME

Spray-Con™ WS ST Wet Shotcrete

MANUFACTURER

Gemite® Products Inc.

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FEATURES

- Low rebound
- Up to 30 cm (12 in) in a single application
- Easy, crack free thick to thin application
- Long lasting crack resistance
- Low shrinkage
- Excellent freeze/thaw durability
- High bond strength
- Salt resistant
- Maintenance free
- Non-toxic
- Easy, superior workability
- Applied by authorized applicators
- Labor saving system

PRODUCT DESCRIPTION

Basic Use

Spray-Con WS ST is used in concrete restoration of bridges, tunnels, parking garages, ceilings, columns, beams, storage tanks, concrete silos and other concrete structures.

Composition and Materials

Spray-Con WS ST is a Portland cement based, fibre reinforced, silica-fume modified wet shotcrete material, formulated for vertical and overhead repairs of deteriorated concrete.

Limitations

Do not apply *Spray-Con WS ST* when the temperature is expected to be below 4°C (40°F) within 48 hours after application. Follow Hot Weather concreting procedures when applying *Spray-Con WS ST* at temperatures exceeding 25°C.

Health and Safety

Spray-Con WS ST is non-toxic. Your skin might be sensitive to hydraulic cement or the liquid additive. We recommend use of rubber gloves. Avoid contact with eyes and prolonged contact with skin. If contact occurs, flush immediately with water. Seek medical advice if irritation occurs. Harmful if digested. Keep product out of reach of children. FOR INDUSTRIAL USE ONLY. Consult MSDS for additional information.

Color

Dark Gray.



Yield

Spray-Con WS ST Premix yields 12.9 L (0.46 ft³) and covers approximately 2.2 m² @ 6 mm (21.9 ft² @ ¼") thickness per bag. *Spray-Con WS ST Concentrate* (single bag) yields 89.3 L (3.4 ft³) and covers approximately 14.9 m² @ 6 mm (161.6 ft² @ ¼") thickness per bag. *Spray-Con WS ST Concentrate* (double bag) yields 178.5 L (6.7 ft³) and covers approximately 29.8 m² @ 6 mm (323.3 ft² @ ¼") thickness per bag.

Allowance must be made for waste and "cut-off".

Packaging

Spray-Con WS ST Premix is supplied in 22.7 kg (50 lb) bags. *Spray-Con WS ST Concentrate* (single) is supplied in 8.5 kg (18.7 lb) bags and *Concentrate* (double) is supplied in 17.1 kg (37.6 lb) bags.

Storage and Transportation

Spray-Con WS ST, stored on pallets in a dry, cool area, has a shelf-life of 12 months. Packaged 55 bags (*Premix*), 80 bags (*Concentrate* Single) or 40 bags (*Concentrate* Double) per pallet.

TECHNICAL DATA

Compressive Strength 28 days (ASTM 109)	41.4 - 44.8 MPa 6,000 - 6,500 psi
Salt Scaling Resistance (ASTM C 672)	excellent
Fibre volume	0.6% min.
Young's Modulus	68.96 Gpa (10 x 10 ⁶ psi)
Freeze/Thaw Resistance (ASTMC666 A)	weight loss be- low 1%
Bond Strength with Concrete	> 1 MPa (>150 psi)

INSTALLATION

Current Guide Specification and Application Instructions contain additional information specific to each application and must be followed. Gemite's Technical Service must be consulted before starting a project to ensure that the correct surface preparation and application procedures are followed.

Surface Preparation

Remove all loose, delaminated or grease contaminated concrete. Use sandblasting, scabbling, high pressure waterblast (min. 8-10,000 psi), or other approved methods to remove any laitance, dirt and efflorescence.

Crack Treatment

Mesh all dynamic cracks with galvanized welded wire fabric mechanically fastened over the crack. See Guide Specifications for detailed instructions.

Reinforcing Steel

Remove concrete behind the reinforcing steel to 25 mm (1 in) depth. Remove loose rust from the surface of the reinforcing steel and apply two coats of *Fibre-Prime* rustproofing.

Mixing

Use mortar paddle mixer, min. 270 L (10 ft³) capacity, or the mixing equipment of the wet shotcrete pump. Place most of the water into the mixer. Remove the separately packaged bag of fibres. Add powder into the water while mixing and mix for one (1) minute. Add sand and cement and mix until free of lumps. Add reinforcing fibres gradually and mix for not more than one (1) minute. Adjust the water for suitable workability. Do not over-mix. Convey mixed material to the point of placement in clean containers.

Discard mixed materials that show signs of attaining initial set. Clean the equipment whenever more than 45 minutes has elapsed between batches. Keep the material consistency constant for an easy and continuous spray application.

Mix Design	Single	Double
<i>Spray-Con WS ST Concentrate</i>	8.5 kg (18.7 lb)	17.1 kg (37.6 lb)
Cement	40 kg (94 lb)	80 kg (188 lb)
Sand	150 kg (353 lb)	300 kg (706 lb)
Water	16.5 L (4.7 USG)	33 L (9.3 USG)
<i>Spray-Con WS ST Premix</i>	22.7 kg (50 lb)	
Water	3.6 L (1.0 USG)	
Aggregate Extension:		
For some applications, the unit can be further extended with 9 mm (3/8 in) pea gravel. Contact Gemite Technical Service for further information.		

Application

Spray apply *Spray-Con WS ST* using wet shotcrete equipment. The sprayer should be equipped with a continuous application mechanism. The operator must have positive on/off control at the nozzle to allow for an even spray. When applying layers in excess of 2.5-5 cm (1-2 in) use a liquid accelerator at the nozzle. Contact Gemite's Technical Service for information regarding the use of *Adi-Con* shotcrete accelerators and the selection of wet shotcrete equipment.

Curing

Spray-Con WS ST must be wet cured for 2 days. Protect against fast drying using a surface evaporation retardant, curing compound or fine water mist. When working under tarps at freezing temperatures, use electrical heaters. Avoid using propane heaters to prevent "carbonation" of the material.

AVAILABILITY AND COST

Spray-Con WS ST is available worldwide. Contact the Manufacturer for the name of the nearest Gemite Representative/Distributor and for current pricing information.

MAINTENANCE

None required.

WARRANTY

A limited twelve (12) month Material Replacement Warranty is available. For complete details contact Gemite's Head Office.

TECHNICAL SERVICE

For advice on suitability of *Spray-Con WS ST* for a specific application, specification assistance and application instructions, contact Technical Service: USA at 888-443-6483; Canada at 905-672-2020.

Short Specification

The concrete repair material will be *Spray-Con WS ST*, crack resistant, fibre reinforced wet shotcrete material manufactured by Gemite Products Inc., [USA 888-443-6483] [Canada 905-672-2020]. *Spray-Con WS* must be applied in accordance with the Manufacturer's specifications and recommendations. Contact the Manufacturer or a local representative for specification assistance and application instructions.

SEWER PIPES REPAIR AND PROTECTION: *Spray-Con WS ST* exhibits an excellent resistance to sulfuric acid generated by oxidation of hydrogen sulfide in sewer systems, manholes, digesters and other concrete structures. The chemical resistance has been tested in hydrogen sulfide chamber, together the Gemite Products coatings *Cem-Kote Flex CR*. The results in terms of weight loss are summarized in the attached Figure and compared with the section loss of conventional concrete under the same conditions. Based on the testing and extensive field experience the hydrogen sulfide resistance properties can be summarized as follows:

The testing of *Spray-Con WS ST* topping shows an excellent resistance to microbiologically formed sulfuric acid in hydrogen sulfide rich atmosphere. *Spray-Con WS ST* is used typically in restoration/repair projects, but can be also used as a protective layer in new construction.

Long term practical experience with *Spray-Con WS ST* wet process shotcrete in the repair of manholes and sewers systems shows that it provides an excellent chemical resistance in hydrogen sulfide rich environments of sewers, manholes, pumping stations, digesters and other concrete structures as part of waste water treatment facilities.

Spray-Con WS ST does not provide a vapor barrier and is insensitive to moisture in the substrate concrete during application, or later, when water in liquid or vapor form may reach the interface between concrete and the repair/protective layer. Polymer coatings and polymer mortars exhibit very good resistance to acid environments, but they must be applied with no pinholes, cracks or openings in order to function. This is very difficult to achieve when dealing with rough concrete, surface moisture and a high humidity environment. The presence of moisture and difficulty in obtaining a pinhole free application of these systems are the main causes for their rapid deterioration of polymer systems.

IMPORTANT: When using centrifuge spraying in pipes or manholes, *Spray-Con WS ST Premix* or *Concentrate*, depending on equipment, thickness of applied layer and finish required, the mix may have to be modified in terms of sand/cement ratio. Please contact Gemite Technical Service for further information. The evaluation of the centrifuge spraying equipment with *Spray-Con WS ST Premix* or *Concentrate* is absolutely necessary to achieve desired results.

