



MEGASTICK® SHOTCRETE

Technical Data Sheet

For Dry, Hybrid and Wet Mix Applications

Product Description

Megastick® Shotcrete is a pre-blended dry shotcrete mixture containing aggregates, silica fume and other carefully selected additives. Megastick® Shotcrete has greatly enhanced shooting characteristics and physical properties.

The processes below detail the options of Megastick® shotcrete applications:

Dry

In the dry process, Megastick® Shotcrete is blown pneumatically through the hose, hydrating the shotcrete at the point of discharge by adding water at the nozzle. This method is typically used for most shotcrete applications from quick repair projects up to major repairs and installs.

Hybrid

In the hybrid process, all water is added to the dry mix shotcrete which is then added into the wet mix auger. This process hydrates said materials while in the mix auger stage; wet materials are then moved into the shotcrete pot for shotcrete shooting. This method combines the best qualities of wet and dry shotcreting, dramatically reducing the dust associated with dry mix shotcrete, while also allowing the use of liquid accelerator at the point of shotcrete discharge. Our Hybrid Wet Carrier is able to hold bulk volumes of dry mix which allows you more freedom in the transportation of materials to your final job destinations. Multicrete Hybrid Wet Carriers can hold up to 6 bulk bags (10,000 KGs) of dry mix. When the Multicrete Hybrid Wet Carrier is empty, a simple cleaning of the mix auger and pot is all that is needed, and services may then be disconnected and ready for its next task.

Wet

In the wet mix process, all water and dry shotcrete material is placed into a mixing vessel (Multicrete Ready-Mix Truck or Trans Mixer) which is then transported to a separate spray unit. This process is typically shot with the use of pneumatics and a concrete line pump. During the mixing stage, chemical admixtures such as air entrainment and other additives can be added during the mixing stage. Wet mixed materials generally have a slump of 150mm (6 inches.) This process is pumped as a thick stream wet mix through a hose and similarly to the hybrid method, provides the option of liquid accelerator to be added at the nozzle. Wet mix is often used in high volume applications.

These shotcrete processes impact the surface at a high velocity resulting in well compacted, high-quality concrete with excellent bonds.

Applications for Dry, Hybrid and Wet Mix shotcrete uses include:

- Slope Stabilization
- Initial and secondary tunnel support
- Structural linings
- Concrete rehabilitation

Megastick® Shotcrete may be used in combination with steel fiber reinforcement to enhance load carrying capacity and with non-caustic accelerator to provide high early strengths and faster set times. It can be blended to meet ACI 506 gradation #1 or #2.



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TEST	METHOD	RESULTS
Compressive Strengths	CSA A23.2-9C	
1 Day		15 (2175 psi)
7 Days		25 (3625 psi)
28 Days		35 (5075 psi)
Flexural Strengths (When fiber is added to mix)		
28 Days	CSA A23.2-8C	6.8 MPa (988 psi)
Flexural Toughness		
Fiber Dosage	ASTM C-1550-05	
60 kg/m ³		450 joules
50kg/m ³		400 joules
40kg/m ³		350 joules
Boiled Absorption	CSA A23.2-11C	5.0%
Permeable Voids	CSA A23.2-11C	14.0%
Set Times @ 3% accelerator	ASTM C-266-21	
Initial Set		10 Minutes
Final Set		15 Minutes
Freeze Thaw	ASTM C-666(M15)	
Acceptance Resistance		
80%		
Megastick® Shotcrete		
96%		
Rebound	Consultant Test	
	Vertical	12%
	Overhead	20%
Aggregate Gradation	ACI 506-R	
Gradation No.2	Structural Shotcrete	
Gradation No.1	Non-Structural Shotcrete	

Note - The performance of shotcrete relies heavily upon application techniques. To determine the quality of shotcrete, material equipment and personnel should all be pre-qualified prior to project and application start up.

Technical Data shown are values achieved using proper shotcrete applications and techniques outlined in the ACI 506 publication. Data achieved is obtained in-house by Multicrete Shotcrete professionals.

Performance Options:

- Megastick® can be accelerated to minimize set-times.
- Can be purchased with or without steel or poly fibers.
- Fiber additions will increase toughness, improve impact resistance, and reduce post crack failures.

Quality

Multicrete Megastick® Dry Shotcrete conforms to ACI 506 standards and is batched in plants that are certified by provincial Ready-Mix Concrete Associations. Regular quality control tests are performed, and test reports are available upon request.

Preparation of Receiving Surface

Surfaces receiving Multicrete Megastick® Shotcrete must be free from dust, grease or other substances that interfere with bonding of the Megastick® material.

Application

Apply Megastick® Shotcrete in accordance with the ACI 506 "Guide to Shotcrete" publication.

Curing

Optimal curing conditions are beneficial for Megastick® Shotcrete. Underground environments are often humid, which aids in curing of cementitious materials. Additional curing methods may be utilized. Refer to ACI 308 "Guide to Curing Concrete."



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Advantages

Cohesion Characteristics. Megastick® Shotcrete has vastly improved cohesion characteristics compared to conventional shotcrete, giving it a strong and sticky nature. This stickiness saves time and money alongside:

- Speed of Execution
- Adjustable Application thickness
- Sagging and sloughing are eliminated
- Application for curved and irregular surfaces
- Labor Saving
- Great adaptability for all projects

Thick layers of Megastick® Shotcrete can be applied in a single pass in both the vertical and overhead orientations without the use of caustic accelerators. This process increases shooting efficiency as passing over work two or three times to achieve a certain thickness is no longer necessary.

Safety Precautions

Megastick® Shotcrete contains Portland cement, silica fume and other carefully selected additives. Normal safety wear such as rubber gloves, dust masks and safety glasses used to handle conventional cement-based products should be worn. Safety Data Sheets (SDS) are available upon request.

Yield, Packaging and Shotcrete Shelf Life

- Multicrete Megastick® Shotcrete is available in 1650 kg bulk bags that, when mixed with water, will produce one cubic yard of concrete.
- These bulk bags are capped and wrapped in durable poly plastics to prevent water from entering these bags when stored outside.
- Additional protection (covering with tarps or placed into a structure) from the elements may be required if bags are to be left outside for longer periods of time.
- If protected from the elements, bagged materials should be used up within one calendar year. If more time has passed, a couple simple tests can determine whether this older material is good for use.

Custom packaging between 500 kg and 2200 kg is also available. Please contact Multicrete to discuss your packaging needs