1. Product Name
- SPEC MIX® Wet Process Shotcrete
  URL: Wet Process Shotcrete
- SPEC MIX® Dry Process Shotcrete
  URL: Dry Process Shotcrete

2. Manufacturer
SPEC MIX, LLC
1230 Eagan Industrial Road
Suite 160
Eagan, MN 55121
Phone: (888) 773-2649
(651) 994-7120
Fax: (651) 454-5315
E-mail: info@specmix.com
Web: www.specmix.com

3. Product Description
Basic Use
SPEC MIX® shotcrete products, available in standard and custom formulas for new construction and restoration projects, above ground or below.

Wet Process Shotcrete
SPEC MIX® Wet Process Shotcrete is a preblended concrete designed for pneumatically applied wet process applications. SPEC MIX® wet process shotcrete products are specifically formulated to produce a highly finishable material with excellent shooting characteristics. SPEC MIX® Wet Process Shotcrete formulations come in ACI gradation 1 (WP-01) and gradation 2 (WP-02 & WP-03) to allow the applicator the ability to select a product specifically designed with an aggregate gradation formulated for the depth of the application. SPEC MIX® Dry Process Shotcrete products are suited for, but not limited to, the repair of bridges, parking structures, dams, or any concrete structure. Available in 80 pound (36.2 kg) and 3,000 pound (1,360.7 kg) bags, SPEC MIX® Dry Process Shotcrete is engineered for optimal adhesion and durability.

Dry Process Shotcrete
SPEC MIX® Dry Process Shotcrete is a preblended concrete designed for pneumatically applied dry process shotcrete applications. SPEC MIX® dry process shotcrete products are specifically formulated for enhanced shooting characteristics and physical performance making this product ideal for pneumatically applied concrete applications. SPEC MIX® Dry Process Shotcrete formulations come in ACI gradation 1 (DP-01) and gradation 2 (DP-02 & DP-03) to allow the applicator the ability to select a product specifically designed with an aggregate gradation formulated for the depth of the application. SPEC MIX® Dry Process Shotcrete products are suited for, but not limited to, the repair of bridges, parking structures, dams, or any concrete structure. Available in 80 pound (36.2 kg) and 3,000 pound (1,360.7 kg) bulk bags, SPEC MIX® Dry Process Shotcrete is engineered for optimal adhesion and durability.

Composition and Materials
SPEC MIX® shotcrete products are a blend of Portland cement, fly ash, silica fume, steel or synthetic fibers, aggregates and special chemical admixtures. Manufactured throughout the United States and Canada, using high tech blending equipment and following strict quality control procedures, the products are produced with raw materials from each geographic region. Contact a local representative for a precise material breakdown by product type.

Types and Sizes
SPEC MIX® shotcrete products are packaged in 80 pound (36.2 kg) bags for easy hand loading and in 3,000 pound (1,360.7 kg) reusable bulk bags for use with any SPEC MIX® material delivery system.

Benefits
- A computer-batching process and strict quality control procedures help ensure that the finished product complies with design and specification requirements
- Batch-to-batch consistency is maintained using dried sand to eliminate the bulking effect of moisture within the aggregate
- Portable SPEC MIX® silos can be enclosed to permit construction in all climates
- Pallets and bulk bag containers are reusable and picked up whenever a new load of material is delivered to a site
- The SPEC MIX® system helps eliminate the shoveling and heavy lifting associated with field mixing
Limitations

Because variation in properties of shotcrete raw materials can be significant, conduct trial shoots using test panels to verify the properties of each mixture.

4. Technical Data

Applicable Standards

American Society for Testing and Materials (ASTM)

- ASTM C42/C42M Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
- ASTM C78 Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading)
- ASTM C457 Standard Test Method for Microscopical Determination of Parameters of the Air-Void System in Hardened Concrete
- ASTM C642 Standard Test Method for Density, Absorption and Voids in Hardened Concrete
- ASTM C666/C666M Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
- ASTM C1116 Standard Specification for Fiber-Reinforced Concrete and Shotcrete
- ASTM C1202 Standard Test Method for Electrical Indication of Concrete’s Ability to Resist Chloride Ion Penetration

American Concrete Institute (ACI)

- ACI 506R Specification for Shotcrete

Physical Properties

See Table 1.

Environmental Considerations

The SPEC MIX System is environmentally friendly and can contribute points toward LEED certification. SPEC MIX bulk bags and pallets are recycled and the silo system eliminates the use of disposable paper bags, thus reducing landfill impact. Raw materials are typically extracted and products are manufactured within 500 miles of the job site.

5. Installation

Preparatory Work

Substrate preparation is critical for promoting good bond. When applying shotcrete materials to concrete surfaces, any deteriorated concrete should be removed until sound concrete is exposed. The exposed surface should be free of loose and/or friable material, and dust.

Methods

Shotcrete must be installed in accordance with the provisions of national or local building codes and ACI 506R and should be applied only by an experienced, certified nozzleman. Although SPEC MIX Wet Process Shotcrete products are designed to reduce rebound, some rebound is to be expected. Do not incorporate rebound material back into the applied shotcrete.

Mixing

When combining water with the shotcrete mixture, either during mixing for wet process application or at the nozzle for dry process applications, use only clean, potable water. Once the water is combined with the shotcrete mixture, all of the batched shotcrete should be installed before a loss of consistency is experienced. This time period may be shorter in hot weather conditions. Dry conditions may cause the shotcrete to harden more rapidly.
Mixing SPEC MIX Wet Process Shotcrete

WEAR IMPERVIOUS GLOVES, such as nitrile.

1. Add the appropriate amount of clean potable water into the mixer for each 80 popund (36.2 kg) bag to reach the required water to cement ratio.*
2. Slowly pour SPEC MIX Wet Process Shotcrete product into the mixer.
3. Mix for 5 minutes until a workable consistency is achieved. Avoid over mixing as this may affect the integrity of the finished product.

*S to determine the gallons of water required per bag to achieve the desired water to cement ratio, contact your local SPEC MIX sales representative.

For consistent results hand mixing is not recommended. Only mechanical batch mixers ensure consistency and workability.

Silo Mixing

When using one of the patented SPEC MIX silo systems, bulk bags are delivered to the project site with a silo. The portable silo is loaded with a job site forklift and the product is dispensed into the mechanical batch mixer. As much or as little material can be mixed to suit project needs.

Application and Curing

Once the shotcrete is applied, a variety of finishing techniques can be used to achieve the desired surface texture. After the desired finish is achieved, provide sufficient moisture to permit continuous hydration of the cementitious materials for optimum curing.

Safety

Download Safety Data Sheets here.

Building Codes

Installation must comply with requirements of all applicable local, state and federal code jurisdictions. Good workmanship, coupled with proper detailing and design, ensures durable, functional and watertight construction.

6. Availability and Cost

SPEC MIX products, as well as the SPEC MIX silo delivery system, are available nationally with local distribution to every major U.S. market and select regions of Canada. Contact SPEC MIX at 888-773-2649 for more information or visit here locate a local representative.

| Table 1—Typical Physical Properties of SPEC MIX Shotcrete Products¹ |
|-----------------|-----------------|-----------------|
| **Wet Process** | WP-1            | WP-2            | WP-3            |
| Compressive strength (ASTM C42) |                  |                  |                  |
| 3 days | 4000 PSI (27.5 MPa) | 3400 PSI (23.4 MPa) | 3400 PSI (23.4 MPa) |
| 7 days | 5000 PSI (34.4 MPa) | 5000 PSI (34.4 MPa) | 5000 PSI (34.4 MPa) |
| 14 days | 6000 PSI (41.3 MPa) | 6000 PSI (41.3 MPa) | 6000 PSI (41.3 MPa) |
| 28 days | 7000 PSI (48.2 MPa) | 7000 PSI (48.2 MPa) | 7000 PSI (48.2 MPa) |
| Minimum flexural strength, ASTM C78 (28 days) | 900 PSI (6.2 MPa) | 900 PSI (6.2 MPa) | 900 PSI (6.2 MPa) |
| Hardened air content, ASTM C457 | 6% (±2%) | 6% (±2%) | 6% (±2%) |
| Rapid chloride permeability in coulombs (ASTM C1202) | 700 Coulombs | 700 Coulombs | 700 Coulombs |
| Maximum water soluble chloride ion % (ASTM C128) | 0.06 | 0.06 | 0.06 |
| Maximum ASR expansion (ASTM 1567) | 0.16 | 0.16 | 0.16 |
| Rapid freeze/thaw (ASTM C666) durability factor | 90 | 90 | 90 |

| **Dry Process** | DP-1            | DP-2            | DP-3            |
| Compressive strength (ASTM C42) |                  |                  |                  |
| 3 days | 2200 PSI (15.1 MPa) | 2500 PSI (17.2 MPa) | 3000 PSI (20.6 MPa) |
| 7 days | 4000 PSI (27.5 MPa) | 4250 PSI (29.3 MPa) | 4500 PSI (31 MPa) |
| 14 days | 5000 PSI (34.4 MPa) | 5500 PSI (37.9 MPa) | 5750 PSI (39.6 MPa) |
| 28 days | 6000 PSI (41.3 MPa) | 7000 PSI (48.2 MPa) | 7500 PSI (51.7 MPa) |
| Flexural strength, ASTM C78 (28 days) | 900 PSI (6.2 MPa) | 900 PSI (6.2 MPa) | 900 PSI (6.2 MPa) |
| Rapid chloride permeability (ASTM C1202) | 700 Coulombs | 700 Coulombs | 700 Coulombs |
| Rapid freeze/thaw (ASTM C666) durability factor | 90 | 90 | 90 |

¹ Actual results may vary due to workmanship, regional material variations and jobsite conditions.
Consult a local SPEC MIX representative for detailed price information.

Because project needs and local product pricing varies from market to market, budget or installed cost information may be obtained from a local SPEC MIX representative or from SPEC MIX LLC by calling 888-773-2649.

7. Warranty

SPEC MIX Limited Warranty

SPEC MIX, LLC warrants this product to be of merchantable quality when used or applied in accordance with the instructions hereon. This product is not warranted as suitable for any purpose or use other than the general purpose for which it is intended. Liability under this warranty is LIMITED to the replacement of its product (as purchased) if found to be defective, or at the shipping company’s option, to refund the purchase price. In the event of a claim under this warranty, notice must be given to SPEC MIX, LLC in writing at: Five Concourse Parkway, Suite 1900, Atlanta, GA 30328. THIS WARRANTY IS ISSUED AND ACCEPTED IN LIEU OF ALL OTHER EXPRESS WARRANTIES AND EXPRESSLY EXCLUDES LIABILITY FOR CONSEQUENTIAL DAMAGES.

8. Maintenance

Properly mixed and installed shotcrete requires little or no maintenance.

9. Technical Services

For technical assistance, contact SPEC MIX, LLC, or a local SPEC MIX representative.

10. Filing Systems

- ConstructConnect
- Additional product information is available from the manufacturer upon request

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