



1. Product Name

- SPEC-MIX® SPECSHOT 5000 MS and MSA Shotcrete
- SPEC-MIX® SPECPATCH Shotcrete
- SPEC-MIX® SPECNAIL Shotcrete
- SPEC-MIX® SPECPOOL Shotcrete
- SPEC-MIX® SPECFINISH Shotcrete

2. Manufacturer

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3. Product Description

BASIC USE

SPEC MIX® shotcrete products are designed for a wide range of applications and are available in standard formulations and custom mix designs to fit specific project requirements, such as casting new structures or restoring existing projects, above or below ground.

SPECSHOT 5000 MS and MSA

SPEC MIX® SPECSHOT 5000 MS and MSA are preblended, high early strength, cement-based products designed to be used for wet or dry process applications, such as underground work, tunneling or any other project where high performance shotcrete is to be installed on vertical, overhead or horizontal surfaces.

SPECSHOT 5000 MSA is an air-entrained shotcrete mixture.

Both products can be custom designed and packaged to meet specific properties and/or project requirements, and both mixtures are specially formulated to produce a cohesive, fast-setting material with good shooting, adhesion and strength characteristics.

SPECPATCH

SPEC MIX® SPECPATCH is a preblended, high early strength, cement-based product designed to be used for wet or dry process repair applications. It can be custom

designed and packaged to meet specific properties and/or project requirements and is also available as an air-entrained shotcrete mixture. This preblended shotcrete mixture is specially formulated to produce a finishable, fast-setting material with good shooting, adhesion and strength characteristics.

SPECNAIL

SPEC MIX® SPECNAIL is a preblended, high early strength, cement-based product designed to be used for wet or dry process soil and slope stabilization applications. It can be custom designed and packaged to meet specific properties and/or project requirements.

This preblended shotcrete mixture is specially formulated to produce a cohesive and fast-setting material with good shooting, adhesion and strength characteristics. SPECNAIL is designed to harden and gain strength quickly for a wide range of soil and slope stabilization applications.

SPECPOOL

SPEC MIX® SPECPOOL is a preblended, high early strength, cement-based product designed to be used for wet or dry process applications for in-ground pool construction. It can be custom designed and packaged to meet specific properties and/or project requirements and is also available as an air-entrained shotcrete mixture.

This preblended shotcrete mixture is specially formulated to produce a cohesive, fast-setting material with good shooting, adhesion and strength characteristics. It can be used for single or 2-coat applications.

SPECFINISH

SPEC MIX® SPECFINISH is a preblended, high early strength, cement-based product designed to be used for wet or dry process in architectural applications, particularly those where aesthetics are important. It can be custom designed and packaged to meet specific properties and/or project requirements.

This preblended shotcrete mixture is specially formulated to produce a cohesive material with good shooting, adhesion, strength and finishing characteristics.

ADVANTAGES

- Total quality control with every bag
- Reduced labor costs and storage space
- Batch-to-batch consistency
- Excellent adhesion characteristics



SPEC MIX, Inc.



SPECNAIL

COMPOSITION & MATERIALS

SPEC MIX shotcrete products are composed of a blend of Portland cement, fly ash, silica fume, fibers (either steel or synthetic), aggregates and special chemical admixtures. Contact the manufacturer for the precise material breakdown by product type.

SPEC MIX shotcrete products are produced under strict manufacturing standards and complete quality control measures are implemented with each batch. A digital printout displaying the proper proportions per batch may be retained as a permanent record. Each SPEC MIX manufacturer certifies that SPEC MIX shotcrete products are designed to meet the project specifications and applicable ASTM and ACI standards.

TYPES & SIZES

SPEC MIX shotcrete is available in 80 or 94 lb (42 or 36 kg) packages for easy hand loading, as well as in 3000 lb (1362 kg) reusable bulk bags to be used with the various patented SPEC MIX silo systems. When using the silo system, and upon delivery of the bulk bags to the project site, the portable silo is loaded, using a jobsite forklift, and the product is dispensed into a mechanical batch mixer (See silo operations manual.). Add water at the nozzle and the shotcrete is ready to dispense.

LIMITATIONS

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

4. Technical Data

APPLICABLE STANDARDS

ASTM International

- 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 C348 Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars
- 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

ENVIRONMENTAL CONSIDERATIONS

Empty bulk bags and wooden pallets are returned to the plant for reuse. This silo system eliminates the use of disposable paper bags, thus reducing landfill impact.

PHYSICAL/CHEMICAL PROPERTIES

Aggregate gradation plays a crucial role in the performance of shotcrete. The majority of the SPEC MIX manufacturing facilities that produce shotcrete can provide combined aggregate gradations that meet ACI 506R gradation numbers for 1, 2 or 3, as specified. See Table 1 for more information.

5. Installation

PREPARATORY WORK

Handle and store product according to SPEC MIX recommendations. SPEC MIX products are custom packaged to the specification and must be stored dry, covered and protected from weather and other damage.

Substrate preparation is critical for promoting good bond. When applying SPECPATCH 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 should be installed in accordance with the provisions of the national or local building code and ACI 506R. Shotcrete prod-

ucts should be applied only by an experienced, certified nozzleman.

SPEC MIX SPECSHOT 5000 MS and MSA are dry, preblended products that may be used in either wet or dry processes. If predampening is not feasible, contact a SPEC MIX representative prior to project setup.

SPEC MIX SPECPATCH and SPECNAIL are dry, preblended products that may be used in either wet or dry processes. SPEC MIX, Inc., recommends predampening of the shotcrete materials for dry-process applications. If predampening is not feasible, a SPEC MIX representative should be contacted prior to project setup.

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. Prior to application of the shotcrete, the substrate should be cleaned and evenly moistened, but not saturated.

Although shotcrete reduces rebound, some rebound is to be expected. Do not incorporate rebound material back into the applied shotcrete.

APPLICATION & 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.

SPECNAIL is designed for a gun finish only. If another finish is desired, contact a SPEC MIX, Inc. representative.

PRECAUTIONS

Safety glasses and a dust mask are recommended when handling any mixture containing silica. The cementitious materials mixed onsite are highly alkaline in nature and, upon contact with water, are irritating to eyes and skin. In case of eye contact, flood eyes repeatedly with clean water and see a physician immediately. Do not rub eyes. Wash hands thoroughly after handling or before eating. Do not take internally. Keep out of reach of children.

TABLE 1 TYPICAL PHYSICAL PROPERTIES OF SPEC MIX SHOTCRETE PRODUCTS ¹

SPECSHOT		
Compressive strength, ASTM C42	SPECSHOT 5000 MS	SPECSHOT 5000 MSA
1 day	2790 psi	3200 psi
3 days	4670 psi	4920 psi
7 days	6020 psi	5760 psi
28 days	6080 psi	6050 psi
56 days	7510 psi	7280 psi
Flexural strength, ASTM C78		
28 days	990 psi	840 psi
Hardened air content, ASTM C457	-	6.0%
Spacing factor	-	200 µm
Rapid chloride permeability in coulombs, ASTM C 1202	514 (very low)	210 (very low)
Volume of permeable voids, ASTM C642	9.4%	9.0%
Rapid freeze/thaw durability factor, ASTM C666	99	100
SPECPATCH		
Compressive strength, ASTM C42	SPECPATCH MS-POLY	SPECPATCH MSA
1 day	1340 psi	1960 psi
3 days	4060 psi	7170 psi
7 days	5760 psi	8720 psi
Flexural strength, ASTM C78		
28 days	990 psi	1080 psi
Hardened air content, ASTM C457	-	6.0% (±2%)
Spacing factor	-	300 µm
Rapid chloride permeability in coulombs, ASTM C 1202	593 (very low)	500 (very low)
Volume of permeable voids, ASTM C642	-	12%
Rapid freeze/thaw durability factor, ASTM C666	88	92
SPECNAIL		
Compressive strength, ASTM C42		
1 day	-	3200 psi
3 days	-	3720 psi
7 days	-	6100 psi
28 days	-	6660 psi
Flexural strength, ASTM C78		
7 days	-	900
28 days	-	1810 psi
Rapid chloride permeability in coulombs, ASTM C 1202	-	89 (negligible)
Volume of permeable voids, ASTM C642	-	12%
Rapid freeze/thaw durability factor, ASTM C666	-	93
SPECPOOL		
Compressive strength, ASTM C42	SPECPOOL MS	SPECPOOL MSA
1 day	3200 psi	1260 psi
3 days	3270 psi	3010 psi
7 days	6100 psi	4720 psi
56 days	6660 psi	6380 psi
Flexural strength, ASTM C78		
7 days	900	720
28 days	1200	960 psi
Hardened air content, ASTM C457	-	6.0% (±2%)
Spacing factor	-	300 µm
Rapid chloride permeability in coulombs, ASTM C 1202	90 (negligible)	545 (very low)
Volume of permeable voids, ASTM C642	12%	12%
Rapid freeze/thaw durability factor, ASTM C666	93	93

¹ Data was compiled from manufacturer's in-house laboratory and field trials and represents achievable results. Actual results may vary, due to workmanship, regional material variations and jobsite conditions.

TABLE 1 TYPICAL PHYSICAL PROPERTIES OF SPEC MIX SHOTCRETE PRODUCTS (CONTINUED) ¹

SPECFINISH		
Compressive strength, ASTM C42		
1 day	-	6540 psi
3 days	-	6600 psi
7 days	-	7940 psi
28 days	-	7970 psi
56 days	-	8270 psi
Rapid chloride permeability in coulombs, ASTM C 1202	-	782
Volume of permeable voids, ASTM C642	-	11.6%

¹ Data was compiled from manufacturer's in-house laboratory and field trials and represents achievable results. Actual results may vary, due to workmanship, regional material variations and jobsite conditions.

BUILDING CODES

Shotcrete should be installed in accordance with the provisions of the local building code and applicable ASTM standards. Good workmanship, coupled with proper detailing and design, ensures durable, functional, watertight construction.

6. Availability & Cost

AVAILABILITY

SPEC MIX shotcrete, as well as the patented SPEC MIX silo delivery system, is available through a network of more than 42 nationally licensed manufacturers with local distribution to every major market. Contact SPEC MIX, Inc., at (888) 773-2649 for more information, or visit www.specmix.com to locate a local manufacturer.

COST

Budget installed cost information may be obtained from a local SPEC MIX manufacturer or through SPEC MIX, Inc.

7. Warranty

Seller warrants that its product will conform to and perform in accordance with the product specifications. The foregoing warranty is in lieu of all other warranties, express or implied, including, but not limited to, those concerning merchantability and fitness for a particular purpose. Because of the difficulty in ascertaining and measuring damages hereunder, it is agreed that, except for claims for bodily injury, Seller's liability to the Buyer or any third party, arising out of the purchase of the Product from the Seller by Buyer shall not exceed the total amount billed and billable to the Buyer for the product hereunder.

8. Maintenance

Properly mixed and installed shotcrete requires little or no maintenance.

9. Technical Services

For technical assistance, contact SPEC MIX, Inc., or a local SPEC MIX manufacturer.

10. Filing Systems

Additional product information is available from the manufacturer upon request.