



Metalcrete Industries

4133 Payne Avenue
Cleveland, Ohio 44103
United States of America

Phone: 440-526-5600

Fax: 440-526-5601

Toll-Free: 800-526-5602

www.metalcreteindustries.com

Specification for Metalcrete - Metallic Aggregate Concrete Topping

1.1 Summary of Work

A. Section Includes:

1.) This Section specifies a premixed, ready to use metallic aggregate concrete topping for floors subjected to increased impact, abrasion, and point-load gouging. The material should be factory proportioned, mixed, and packaged by the manufacturer. Each material is blended with specially processed graded metallic aggregates, cementitious binders, powdered superplasticizers, water-reducing admixtures, and other proprietary chemicals.

2.) For use on new or existing concrete for both interior and exterior applications.

1.1.2. Related work described elsewhere in Section 3300.

1.2 Quality Assurance

1.2.1. Comply with requirements of standard specified herein and as listed in section _____.

1.2.2. Comply with the following codes, standards, and recommended practices:

ACI 301	Specification for Structural Concrete for Buildings
ACI-302	Guide for Concrete Floor and Slab Construction
ACI-304	Guide for Measuring, Mixing, Transporting, and Placing Concrete
ACI-305	Hot Weather Concreting
ACI-306	Cold Weather Concreting
ACI-318	Building Code Requirements for Reinforced Concrete
CRSI	Manual of Standard Practice

1.2.3. Qualifications of manufacturers: Products used in the work of this section shall be produced by a manufacturer with successful history of at least 25 years of supplying metallic aggregate flooring systems and concrete curing compounds and be acceptable to the Architect / Engineer.

1.2.4. Qualification of contractors: Use adequate number of laborers and craftsmen who are thoroughly trained and experienced in the necessary skills and who are completely familiar with the specification requirements and the methods needed for proper performance of the work in this section. The contractor shall have a successful history of at least 10 years of installing industrial concrete flooring systems and be acceptable to the Architect / Engineer.

1.3. Submittals

1.3.1. Comply with requirements of standard specified herein and as listed in section _____.

1.3.2. Manufacturers Data: Metalcrete Industries, Inc.
 4133 Payne Avenue
 Cleveland, Ohio 44103
 Phone: (440) 526-5600

1.3.3. Substitutions: Any request for product substitution must be submitted for review, with all necessary documentation, prior to time of bid. No request for substitutions will be considered after bid has been received.

1.3.4. Shop drawings for reinforcing steel and accessories prepared in accordance with ACI 315 - "Details and Detailing of Concrete Reinforcement".

1.3.5. Pre-Concrete Construction Conference: A meeting shall be held at the project-site with the architect, engineer, contractor, owner's representative, and specialty topping manufacturer to review placing techniques and finishing methods, required finishing equipment, testing and quality control assurance procedures.

2.1 Products

2.1.1 Metallic Aggregate Concrete Topping: "Metalcrete Metallic Topping" as manufactured by Metalcrete Industries, Inc., shall consist of specially processed graded metallic aggregates, cementitious binders, powdered superplasticizers, water-reducing agents, and other proprietary chemicals necessary to produce an extra heavy-duty, high-strength, abrasion resistant, impact resistant concrete topping floor surface. The concrete topping material shall be ready-to-apply over a properly prepared concrete surface. The material shall be packaged in 50-pound or 3,000-pound moisture resistant bags at the manufacturer's owned and controlled factory. The high-strength metallic topping shall have a minimum compressive strength at 28 days of 12,000 psi in accordance with ASTM C 109. The high-strength metallic topping shall be applied at a thickness between 2.0" and 6.0" as dictated by the Architect / Engineer.

2.1.2 Curing Material: "Seal N Kure 30" as manufactured by Metalcrete Industries, Inc. shall exceed the moisture retention requirements of ASTM C 309. The compound shall have a 30% minimum solids content, and will not yellow when exposed to ultra violet light. Sodium Silicate compounds are strictly prohibited. Sodium Silicate compounds are strictly prohibited.

2.1.3 Joint Filling Material: "Flexfill" or "Jointfill 302" as manufactured by Metalcrete Industries, Inc., shall exceed the performance requirements of ACI 302, Section 4.10. The joint filler shall be a two-component epoxy system.

3.1 Execution

3.1.1 Metallic Aggregate Concrete Topping Application: "Metalcrete Metallic Topping" shall be applied at a thickness between 2.0" and 6.0" as dictated by the Architect / Engineer. Mill, water blast, shot blast, or chip concrete down to proper elevation to sound concrete and to accommodate topping thickness. A CSP 9 is the ideal surface profile to bond to. Remove all loose material and debris. Clean floor surface of all dust and dirt with water and compressed air. Make sure all concrete dust is removed from pore structure of concrete surface. Failure to properly clean the surface will prevent proper bond. Use a wet vacuum for hard to clean areas. Allow concrete surface to dry. Saw cut the perimeter of the repair area and key into the base concrete. Installing perimeter anchors is a good method to increase the mechanical bond between the base concrete and the topping material. Metco Low-Mod Epoxy, as manufactured by Metalcrete Industries, is applied to the dry base concrete using stiff brooms, squeegees, and rollers at an application rate of approximately 30 - 60 square feet per mixed gallon depending on the texture of the base concrete. While the epoxy bond coat is wet, quartz aggregate is broadcasted into the surface until refusal. Broadcast aggregate must be a course gradation. Recommended mesh size: 37% 6 mesh, 57% 8 mesh, 5% 10 mesh, and 1% pan. After the epoxy has cured (the next day), remove all unbonded aggregate from the surface using a combination of blowers and vacuums. Once all unbonded aggregate is removed, the surface is ready to receive the Metalcrete high-strength concrete topping. Mix Metalcrete in a mortar mixer using 0.48 gallons (1.8 liters) of water per 50-lb. bag. Several bags can be mixed at one time depending on the size of mixer. Add the water first and follow with dry powder. Hold back 10% of water and mix material stiff if lumping starts to occur. Add remaining water and mix for 2 to 3 minutes. A 5 inch (127 mm) to 6 inch (152 mm) slump should be achieved and minor water adjustments are permissible to achieve this slump. When mixing 3,000-lb. bulk bags, approximately 28-gallons of water are required per bulk bag. An electronic water flow meter should be utilized to ensure proper mixing. Place Metalcrete directly over the primed surface. A backpack vibrator helps consolidate the mixed topping material and reduces entrapped air. Strike off or power screed into place using a roller screed or vibratory truss screed. Power screeding is preferred to achieve maximum consolidation and density. Bullfloat surface of topping. Use Waterhold evaporation retardant to prevent moisture loss while waiting for topping to set. When the topping will support a man and finishing machine, float surface (with float shoes on trowel blades) to consolidate surface and fill any imperfections. Trowel surface to produce a hard, smooth surface with subsequent finishing operations. Time troweling to prevent blisters.

3.2 Curing and Protection

3.2.1 The high-strength metallic aggregate topping shall be cured and protected with the specified curing material. Seal N Kure 30 may be applied by roller, hand sprayer, power sprayer, or lambs wool applicator. Use directly out of container and apply uniformly and evenly. Avoid heavy build up. Lap material within 15 minutes for best results. Follow recommended coverage rates.

3.3 Construction and Control Joints

3.3.1 Flexfill or Jointfill 302 as manufactured by Metalcrete Industries, Inc. shall be applied into all construction and control joints. Place Flexfill or Jointfill 302 full depth of the joint to protection joint edges from spalling and impact.

3.4 Protection

3.4.1 Cover floor with Burlene Concrete Curing Blanket and keep free from traffic and loads for a minimum of 48 hours after final trowel of the high-strength metallic topping.