SSPC: The Society for Protective Coatings

Abrasive Standard No. 4

RECYCLABLE ENCAPSULATED ABRASIVE MEDIA
(in a compressible cellular matrix)

1. SCOPE

1.1 This standard provides requirements for selecting and evaluating abrasive media encapsulated in a compressible non-uniform cellular matrix used to blast clean steel and other surfaces prior to the application of protective coatings. The standard also includes requirements for quality control of new and recycled media.

2. DESCRIPTION

2.1 ENCAPSULATED ABRASIVE MEDIA: Encapsulated abrasive media consist of natural or manufactured abrasive grains surrounded by a dry, compressible, open-cell material. These abrasives are used to reduce dust generation and ricochet damage to adjacent surfaces when blast cleaning, and to "feather" the edges of intact coating during spot repair procedures of coatings on steel and other substrates. During the recycling process, the media is cleaned to remove abrasive fines and debris, including paint, rust, mill scale, and other contaminants.

2.2 RECYCLED ABRASIVE WORKING MIX: The working mix develops during blast cleaning and recycling, and is composed of new and recycled encapsulated abrasive media.

2.3 DEFINITIONS

Qualification tests are tests that are run to qualify that a material meets the requirements of the standard.

Conformance tests are tests that are performed to verify that the material being submitted has the same properties as the material that initially qualified.

Quality control tests are field tests that are performed to verify that the material complies with specified requirements immediately prior to use.

3. REFERENCED STANDARDS

3.1 The latest issue, revision, or amendment of the referenced documents in effect on the date of invitation to bid shall govern, unless otherwise specified. Those documents marked with an asterisk (*) are referenced only in the Notes, which are not requirements of this standard.

3.2 If there is a conflict between the requirements of any of the cited referenced standards and this standard, the requirements of this standard shall prevail.

3.3 SSPC Standards:

AB 1	Mineral and Slag Abrasives
AB 3	Ferrous Metallic Abrasives

3.4 American Society for Testing and Materials (ASTM) Standards:[1]

D4940	Standard Test Method for Conductimetric Analysis of Water Soluble Ionic Contamination of Blasting Abrasives
* **D4417**	Standard Test Method for Field Measurement of Surface Profile of Blast Cleaned Steel
D7393	Practice for Indicating Oil in Abrasives

4. Requirements for New Media (Qualification Tests)

The abrasive manufacturer shall certify that new media meeting this standard complies with the requirements of Sections 4.1 through 4.5.

4.1 GRIT REQUIREMENTS: Mineral and slag abrasives shall meet the requirements of SSPC-AB 1. Ferrous metallic abrasives shall meet the requirements of SSPC-AB 3. When aluminum oxide is used, the aluminum oxide grain shall be of sufficient hardness to scratch glass when tested by placing some of the abrasive material between two glass microscope slides and, while applying pressure, moving one slide over the other in a reciprocating motion. The glass slide shall be examined for scratches. The abrasive manufacturer shall certify that the aluminum oxide grit meets the following requirements:

Minimum aluminum oxide content 95%
Minimum specific gravity 3.60

4.2 DUST CONTROL: Dust shall be controlled and the dry encapsulating matrix shall demonstrate reduced dust emission characteristics. The manufacturer shall provide certification that emission levels as documented in EPA's Compilation of

[1] ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. For referenced ASTM standards, visit the ASTM website, <http://www.astm.org>, or contact ASTM Customer Service at service@astm.org. For Annual Book of ASTM Standards volume information, refer to the standard's Document Summary page on the ASTM website.

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Air Pollutant Emission Factors (AP-42 Section 13.1)[2] or as determined in similar independent test protocols demonstrate that the foam component in the composite has the ability to maintain emission levels through 10 blast cycles below 0.02 kg/kg of total particulates and below 0.004 kg/kg of PM-10, or as otherwise specified.

4.3 SURFACE PROFILE: Abrasives meeting the requirements of this standard shall be capable of providing the surface profiles required by the user.

4.4 WATER-SOLUBLE CONTAMINANTS: The conductivity of the encapsulated abrasive shall not exceed 1000 microsiemens/cm (μS/cm) when tested in accordance with ASTM D4940.

4.5 OIL CONTENT: When tested in accordance with ASTM D7393, no oil shall be visible on the surface of the water or as an emulsion.

4.6 HEALTH AND SAFETY REQUIREMENTS: The abrasive material as supplied shall comply with all applicable federal, state, and local regulations (see Note 9.3).

4.6.1 The manufacturer shall provide the purchaser with sufficiently detailed chemical analyses to provide the protective engineering and administrative controls for blast cleaning identified in federal, state, and local codes.

4.6.2 Safety data sheets (SDS) shall be furnished for all abrasive materials supplied.

5. CONFORMANCE TESTS

Upon receipt the purchaser shall verify performance of the material in accordance with Sections 4.1, 4.4, and 4.5.

6. QUALITY CONTROL TESTS

The following tests shall be conducted by the end-user of the abrasive (e.g., contractor) during conduct of the job to ensure quality.

6.1 REQUIRED PROFILE: In-process testing for compliance with profile requirements shall be performed as specified on the surface being prepared (see Note 9.1).

6.2 REQUIREMENTS FOR RECYCLED ABRASIVE WORKING MIX

6.2.1 Particle Size Distribution

6.2.1.1 The contractor shall process the media through a flat deck, vibratory screen classifier that separates both oversized and undersized particles; or other unit shown to meet the dust control requirements of Section 4.2. New media shall be added to the working mix as necessary to deliver the specified surface profile. After recycling, all particles shall pass an ANSI #3 screen and not more than 10% shall pass an ANSI #20 screen. Within this range, screen sizes are frequently adjusted to meet project requirements.

6.2.1.2 Test for Classifier Efficiency: The test is performed as follows:

Step A. A quantity of recycled media is passed once through the classifier. The rejected material that passes through the bottom sieve is collected, the weight or volume is measured, and the material is labeled and set aside.

Step B. The remaining media from Step A is passed through the classifier a second time. The rejected material that passes through the bottom sieve is again collected, and the weight or volume of material is measured. The material is labeled and set aside.

Step C. The remaining media from Step B is passed through the classifier. The material that passes through the bottom sieve is collected, and the weight or volume of material is measured.

Step D. The rejected material collected from Steps B and C is combined.

If the weight or volume of rejected material from Step D is equal to or greater than the weight or volume of rejected material measured in Step A, adjustments to the classifier and or flow rate shall be made to increase the classifier efficiency (see Note 9.2).

6.2.1.3 Testing Schedule: The test described in Section 6.2.1.2 shall be conducted two hours after the startup of cleaning operations, and repeated every two hours. After three tests have been completed at two-hour intervals, the test interval is typically expanded to once every ten hours of operation, or as specified.

6.2.2 Water-Soluble Contaminants: The abrasive material shall be tested for water-soluble contaminants in accordance with ASTM D4940. A representative sample shall be obtained by collecting a minimum of three samples (approximately 450 grams [1 lb] each) of the recycled abrasive material. The three samples shall be collected at three different times during an 8-hr period before new media is added to the recycled material. The conductivity of each abrasive sample shall not exceed 1000 μS/cm when tested in accordance with ASTM D4940.

6.2.3 Oil Content: The abrasive material shall be tested for oil content in accordance with ASTM D7393. Representative samples of the recycled material obtained according to the procedure in Section 6.2.2 shall have no oil visible on the surface of the water or as an emulsion.

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