



Engineering Standard

SAES-Q-011

22 August 2009

Epoxy Grout for Machinery Support

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Saudi Aramco DeskTop Standards

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I Scope

This Standard prescribes minimum mandatory requirements governing the materials, design and installation of epoxy grouts for machinery supports. Cementitious grout shall be in accordance with SAES-Q-010.

Commentary Note:

SAMS stock numbers 09-240-417-00/418-00/419-00, 09-240-422-00 & 09-247-155-00 (SAP new material numbers are 1000187493/1000187496/1000187520/1000187524 & 1000187848 respectively) or equal products that comply with the requirements of this standard can be used.

II Conflicts and Deviations

- A. Any conflicts between this standard and other applicable Saudi Aramco Engineering Standards (SAESs), Materials System Specifications (SAMSSs), Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the company or buyer representative through the Manager, Consulting Services Department of Saudi Aramco, Dhahran.
- B. Direct all requests to deviate from this standard in writing to the company or buyer representative, who shall follow internal company procedure SAEP-302 and forward such requests to the Manager, Consulting Services Department of Saudi Aramco, Dhahran.

III References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities covered by this standard shall comply with the latest edition of the references listed below unless otherwise noted.

- A. Saudi Aramco References

Saudi Aramco Engineering Procedure

SAEP-302

*Instructions for Obtaining a Waiver of a
Mandatory Saudi Aramco Engineering
Requirement*

Saudi Aramco Engineering Standard

SAES-Q-010

*Cement Based, Non-Shrink Grout for Structural
and Equipment Grouting*

Saudi Aramco Materials System Specification

09-SAMSS-060

Packaging Requirements for Coating

B. Industry Codes and Standards

American Society for Testing and Materials

ASTM C307

Standard Test Method for Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacing

ASTM C413

Standard Test Method for Absorption of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C469

Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression

ASTM C531

Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C579

Standard Test Method for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing and Polymer Concretes

ASTM C580

Standard Test Method for Flexural Strength and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C1181

Standard Test Method for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts

Process Industry Practices

PIP STS03601

Epoxy Grout Specification

PIP REIE686

Recommended Practices for Machinery Installation and Installation Design

IV Modifications to Process Industry Practice STS03601

The following paragraph numbers refer to STS03601 (October, 2001), which is part of this specification. The text in each paragraph is an addition, exception, modification, or deletion to STS03601 as noted. Paragraph numbers not appearing in STS03601 are new paragraphs to be inserted in numerical order.

- 1.1 Delete this paragraph in its entirety.
 - 2.0 Delete this paragraph in its entirety except PIP REIE686.
 - 4.4 (Addition) The contractor shall comply with the safety requirements specified in the grout manufacturer's data sheets.
 - 5.1.1.4 (Exception) Maximum creep (ASTM C1181) is 0.005 mm/mm tested at 60 degrees C with 400 psi applied vertical load.
 - 5.1.3 (Addition) All materials shall satisfy the following:
 - 5.1.3.1 Resin component shall consist of a pre-measured, prepackaged, solvent free, liquid epoxy resin specifically formulated for the used grout system.
 - 5.1.3.2 The hardener component shall consist of a pre-measured, prepackaged liquid specifically formulated to produce the specified final properties when mixed with the other component.
 - 5.1.3.3 The aggregate shall be a pre-measured, prepackaged blend of inert, inorganic particulate fillers, such as silica, designed specifically to provide the proper flow, handling and physical properties required for the grout product.

The ratio of aggregate to resin and hardener shall be per the manufacturer recommendations. If aggregate ratio is adjusted for field conditions, physical properties shall be obtained at the recommended fill ratio.
 - 5.1.3.4 The resin and catalyst components shall be free of hard sediment, show no gelation in a freshly opened can, and shall be of proper consistency to enable thorough mixing to a smooth homogenous state. The components shall show no gelling when stored for the shelf life indicated on the data sheets from the date of manufacture in unopened containers at temperatures of 32°C. Resin and catalyst containers shall not leak when subjected to normal shipping and storage. Packaging shall meet the requirements of 09-SAMSS-060.
 - 5.1.3.5 All components, resin, hardener, and aggregate shall be properly labeled, including batch numbers, shelf life and storage requirements.
 - 6.1.2 (Addition) When type of grout is not specified by the equipment Manufacturer epoxy grout shall be used for any of the following situations:
 - a. Equipment with driver horsepower 500 (373 kW) or greater.
 - b. Equipment with speeds greater than 3600 RPM.
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- c. Equipment that has a combined weight (machine, driver, and baseplate) of greater than 2,270 kg (5,000 lbs).
 - d. All reciprocating machinery with driver horsepower greater than 50 (37 kW).
- 6.2.2 (Addition) Grout shall be applied only when surrounding temperatures are between 15°C and 32°C (60°F and 90°F) unless otherwise specified in the manufacturer's data sheets. (Appendix L.4.1 of API STD 610, 95 revision).
- 6.2.8 (Addition) The epoxy grout manufacturer's recommendations on maximum depth of pour and length to width ratio shall be followed.
- 6.2.9 (Addition) If the grout pour is 100 mm or deeper, the grout manufacturer recommendations for installing reinforcement rebars shall be followed.
- 6.4.9 (Addition) The corners of mounting plates shall be rounded to at least a 50 mm radius where feasible to prevent crack-producing stress raisers in the grout.

Revision Summary

22 August 2009

Revised the "Next Planned Update." Reaffirmed the contents of the document, and reissued with no other changes.