

Engineering Standard

SAES-K-600

30 March 2005

Side-Entry Mixers

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Saudi Aramco DeskTop Standards

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1 Scope

This Standard covers mandatory requirements governing the design and installation of side-entry mixers. This Standard may not be attached to or made a part of purchase orders.

2 Conflicts and Deviations

- 2.1 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, Saudi Aramco, Dhahran.
- 2.2 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, Saudi Aramco, Dhahran.

3 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.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedure

[SAEP-302](#)

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

Saudi Aramco Materials System Specification

[32-SAMSS-017](#)

Side-Entry Mixers

Saudi Aramco Engineering Standard

[SAES-G-005](#)

Centrifugal Pumps

Saudi Aramco Form and Data Sheet

*Form 8130-ENG &
Form 8130-M-ENG*

Data Sheet Side-Entry Mixers

4 Design

4.1 General

4.1.1 Mixers for control of bottom sludge and wax (B S & W) shall be of the swivel angle type.

4.1.2 Mixers used for obtaining constant product quality and temperature may be either of the fixed or swivel angle type.

4.2 Shaft Seals

Seals shall be in accordance with the Mechanical Seal Selection criteria contained in [SAES-G-005](#).

4.3 Materials of Construction

For non-corrosive liquids and dry crude oils the following materials shall be used:

Casing	ASTM A278 Class 40
Impeller	ASTM A278 Class 40
Shaft	ASTM A576 Type 1021*
Shaft sleeves	ASTM A276 Type 316L*
Tierods	ASTM A322 Type 4140
Swivel ball	ASTM A743 CF3M

* The shaft or shaft sleeve area under the mechanical seal dynamic sealing elastomer shall be overlaid with wear resistant material such as Stellite or Colmonoy.

5 Installation

5.1 Location of Inlet, Outlet, Mixer Manhole and Offset Angle

Mixer manholes shall be positioned as follows:

a) For Blending:

The first mixer shall be positioned at an angle of 22-½ deg in a clockwise direction from the inlet nozzle.

Where more than one mixer is required, the second mixer shall be located at 22-½ deg from the first and in the same (clockwise) direction.

The offset angle shall be a minimum of 10 deg.

- b) For B S and W control:

The first mixer shall be positioned opposite the outlet nozzle.

Where more than one mixer is required, the first mixer shall be positioned in the quadrant opposite the outlet nozzle.

Manholes shall not overlap tank welded seams. If this cannot be avoided, the angle of 22-½ deg can be increased.

5.2 Impeller Clearance

For minimum clearances of impellers, see [32-SAMSS-017](#) paragraphs 4.2.1.5 and 4.10.4. For floating roof tanks, the minimum distance between the impeller tips and the underside of the floating roof shall be 2-½ times the impeller diameter. A limiting device to stop the mixer shall be installed if this distance could be infringed.

6 Testing and Inspection

- 6.1 For mixer types and models that have not been used in Saudi Aramco facilities, all tests shall be witnessed.
- 6.2 If a series of identical mixers is ordered from a new source, a witnessed inspection shall be performed on two units, these being the first one completed, followed by a second selected at random.
- 6.3 Tests shall be conducted with the actual driver at rated speed.

Revision Summary

30 March 2005

Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with editorial changes.