Electric Submersible Pump Testing

API RECOMMENDED PRACTICE 11S2
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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

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Electric Submersible Pump Testing

1 Scope

1.1 General

This recommended practice provides guidelines and procedures covering electric submersible pump performance testing. These recommended practices are considered appropriate for most pump applications, including gas handlers and high-speed pumps.

1.2 Coverage

This recommended practice covers the acceptance testing of electric submersible pumps (sold as new) by the manufacturer, vendor, or user to the prescribed minimum specifications. This recommended practice does not include other electric submersible pump system components.

2 Normative Reference

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Recommended Practice 11S8, *Recommended Practice on Electric Submersible System Vibrations*

3 Terms, Definitions, and Abbreviations

3.1 Terms and Definitions

3.1.1
affinity laws
Relationships between pump performance and pump speed ratios. For test purposes, the speed ratios are between rated rpm and test rpm.

a) Speed adjusted flow = $\frac{\text{rated rpm}}{\text{test rpm}} \times \text{test flow}$

b) Speed adjusted head = $\left(\frac{\text{rated rpm}}{\text{test rpm}}\right)^2 \times \text{test head}$

c) Speed adjusted brake horsepower = $\left(\frac{\text{rated rpm}}{\text{test rpm}}\right)^3 \times \text{test brake horsepower}$

3.1.2
allowable head-flow rate performance band
A region on either side of a published head-flow rate performance curve (see Figure 2). The limits of this band are defined by a series of vectors with their origin on the published head-flow rate performance curve. The vectors are defined by application of the head and flow tolerances in Table 2.