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Axial Compressors for Air Service

GP 10-03-04

Scope

- 1) [I] This Global Practice (GP) refers to API STD 617-6, Sixth Edition, February 1995, which is part of this GP.
- 2) [I] This GP covers axial compressors in process air service.
- 3) [I] All Specifications in this GP are additions to those of API STD 617-6 unless specifically noted as exceptions. Paragraph numbers in this GP which do not appear in API STD 617-6 are new paragraphs.
- 4) [I] An asterisk (*) indicates that a decision by Purchaser is required, or Purchaser furnishes that additional information.

Note: A bullet is shown in API STD 617-6 indicating that a Purchaser's decision is required.

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1. Required References

[I] This Section lists the Practices and Standards which shall be used with this Global Practice. Unless otherwise specified herein, use the latest edition.

1.1. Global Practices–ExxonMobil Engineering Practices

GP 02-01-01	Plant Noise Design Criteria
GP 03-16-01	Flanged Joints, Gaskets, and Bolting
GP 10-11-01	Sizing of Drivers and Transmissions for Compressors, Fans, and Pumps
GP 10-12-01	Vibration, Axial-Position, and Bearing-Temperature Monitoring Systems for Compressors and Drivers
GP 10-14-01	Lube and Seal Oil Systems for Machinery
GP 18-10-01	Additional Requirements for Materials
GP 18-12-01	Positive Material Identification
GP 20-01-01	Inspection of Equipment and Materials

1.2. API–American Petroleum Institute

API STD 616	Gas Turbines for Petroleum, Chemical, and Gas Industry Services
API STD 617-6	Centrifugal Compressors for Petroleum, Chemical, and Gas Service Industries Errata June 15, 1998

1.3. ASME–American Society of Mechanical Engineers

Unless specific references to the ASME Code are listed, an IHS link to the Introduction is provided to facilitate accessing the relevant parts of the Code.

ASME SEC VIII D1	BPVC Section VIII - Rules for Construction of Pressure Vessels - Division 1
ASME PTC 10	Performance Test Code on Compressors and Exhausters (Performance Test Codes)

2. Additional Requirements

* [I] The following Practices and Standards shall be used with this GP as specified by the Owner's Engineer.

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2.1. Global Practices–ExxonMobil Engineering Practices

GP 10-07-02	Special Purpose Steam Turbines
GP 10-08-01	Combustion Gas Turbines
GP 10-10-01	Special Purpose Gear Units
GP 15-01-02	Instrumentation for Compressors and Drivers
GP 15-07-01	Electric Power Branch Circuit Design for Instrumentation
GP 15-07-02	Protective Systems
GP 15-11-01	Instrument Control Panels
GP 16-09-01	Low Voltage AC Motors Up to 200 HP (150 kW)
GP 16-09-02	AC Motors: Medium Voltage and Low Voltage Over 200 HP (150 kW)

2.2. ASTM–American Society for Testing and Materials

ASTM A 488/A 488M	Standard Practice for Steel Castings, Welding, Qualifications of Procedures and Personnel
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3. Revisions to API Standard 617

All items contained herein correspond to paragraph numbering within API STD 617-6 and reflect additions, substitutions, modifications, and deletions. All provisions not modified or deleted remain in force.

Modifications to Section 1: Scope

1.1. Addition: Scope, Vendor Qualification

- a) [O], [R] Qualified Vendors with experience in manufacturing the units proposed shall supply the compressor systems. To qualify, Vendor must have manufactured at the proposed point of manufacture, at least two compressors of comparable speed, power rating, and discharge pressure. These compressors must have been in service for at least one year and be performing satisfactorily. Also see Item 1.1g of this Section.
- b) Alternatively, Vendor may satisfy this experience requirement on an individual component and service condition basis. Experience need not be concentrated in a single compressor, but may be spread through several operating compressors. To qualify, each of these compressors must have been in service for at least one year and be performing satisfactorily.
- c) The critical areas relative to service conditions, which must be demonstrated to the satisfaction of the Owner's Engineer, include but are not limited to the following:
 - i) Pressure

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- ii) Volumetric capacity
- iii) Power rating
- iv) Speed
- v) Temperature
- d) The critical areas relative to mechanical design, which must be demonstrated to the satisfaction of the Owner's Engineer, include but are not limited to the following:
 - i) Sealing system
 - ii) Bearing design and loading
 - iii) Number of stages and staging arrangement
 - iv) Casing size and design
 - v) Casing joint design
 - vi) Rotor dynamics
 - vii) Blade and disk mechanical design and performance
 - viii) Material selection
 - ix) Power transmission components—design and arrangement
- e) In the area of component mechanical design, Vendor must show that each component has operated under the same conditions as those of the proposed compressor.
- f) Compressors manufactured under a license agreement shall carry the licensor's written guarantee.
- g) * Where Vendor qualification requirement of Item 1.1a) above prevents the application of the latest technology, Vendor shall submit a second alternative proposal incorporating such features for evaluation by the Owner's Engineer. Such proposal shall specifically identify the undemonstrated features and state their advantages.

Modifications to Section 2: Basic Design

2.1.3. Addition: Basic Design

[O], [C] For constant speed compressors, the specified capacity shall be guaranteed with the understanding that the head shall be within +5 percent and -0 percent of that specified; the power shall not exceed stated power by more than 4 percent. These tolerances are not additive. See Paragraph 4.3.6.1.4.

2.1.4. Addition: Basic Design

* [O] The rise in pressure ratio from normal capacity to the surge point at normal speed shall not be less than that specified.

2.1.9. Addition: Basic Design

* [I], [R] Compressors and auxiliaries shall be suitable for outdoor installation.
Compressors and auxiliaries shall be winterized for the climatic zone specified.

2.1.10. Addition: Basic Design

[E], [I] Compressor vendors shall submit noise emission data for the quoted machine with their proposal per [GP 02-01-01](#).

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