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| GP 10-03-03 | Rotary Screw Compressors | September 2003 |
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# Rotary Screw Compressors

## GP 10-03-03

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### Scope

- 1) [I] This Global Practice (GP) covers rotary screw compressors and silencers.
  - 2) [I] All requirements specified in this GP are additions to those of API STD 619-3, 3rd Edition, June 1997, unless specifically noted as exceptions. Paragraph numbers in this GP which do not appear in API STD 619-3 are new paragraphs.
  - 3) [I] An asterisk (\*) indicates that a decision by the Purchaser is required or that additional information is furnished by the Purchaser.
  - 4) [I] A bullet (•) is shown in API STD 619-3 indicating that a Purchaser decision is required.
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## 1. Required References

This Section lists Practices and Standards that are generically referenced and assumed to be a part of this document. Unless otherwise specified herein, use the latest edition.

### 1.1. Global Practices–ExxonMobil Engineering Practices

|                             |                                                                                                   |
|-----------------------------|---------------------------------------------------------------------------------------------------|
| <a href="#">GP 02-01-01</a> | Plant Noise Design Criteria                                                                       |
| <a href="#">GP 10-11-01</a> | Sizing of Drivers and Transmissions for Compressors, Fans, and Pumps                              |
| <a href="#">GP 10-12-01</a> | Vibration, Axial-Position, and Bearing-Temperature Monitoring Systems for Compressors and Drivers |
| <a href="#">GP 10-14-01</a> | Lube and Seal Oil Systems for Machinery                                                           |
| <a href="#">GP 18-10-01</a> | Additional Requirements for Materials                                                             |
| <a href="#">GP 18-12-01</a> | Positive Material Identification                                                                  |
| <a href="#">GP 20-01-01</a> | Inspection of Equipment and Materials                                                             |

### 1.2. API–American Petroleum Institute

|               |                                                                                                                |
|---------------|----------------------------------------------------------------------------------------------------------------|
| API STD 618   | Reciprocating Compressors for Petroleum, Chemical, and Gas Industry Services                                   |
| API STD 619-3 | Rotary Type Positive Displacement Compressors for Petroleum, Chemical, and Gas Industry Services Third Edition |

## 2. Additional Requirements

The following Practices and Standards shall be used with this Practice as specified by the Purchaser

### 2.1. Global Practices–ExxonMobil Engineering Practices

|                             |                                             |
|-----------------------------|---------------------------------------------|
| <a href="#">GP 03-16-01</a> | Flanged Joints, Gaskets, and Bolting        |
| <a href="#">GP 03-18-01</a> | Piping Fabrication Shop or Field            |
| <a href="#">GP 06-01-01</a> | TEMA Type Shell-and-Tube Heat Exchangers    |
| <a href="#">GP 06-04-01</a> | Air-Cooled Heat Exchangers                  |
| <a href="#">GP 10-07-02</a> | Special Purpose Steam Turbines              |
| <a href="#">GP 10-10-01</a> | Special Purpose Gear Units                  |
| <a href="#">GP 15-01-02</a> | Instrumentation for Compressors and Drivers |

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| <a href="#">GP 15-07-01</a> | Electric Power Branch Circuit Design for Instrumentation       |
| <a href="#">GP 15-07-02</a> | Protective Systems                                             |
| <a href="#">GP 15-11-01</a> | Instrument Control Panels                                      |
| <a href="#">GP 16-09-01</a> | Low Voltage AC Motors Up to 200 HP (150 kW)                    |
| <a href="#">GP 16-09-02</a> | AC Motors: Medium Voltage and Low Voltage Over 200 HP (150 kW) |

## 2.2. ASME–American Society of Mechanical Engineers

|                  |                                                                                                                                  |
|------------------|----------------------------------------------------------------------------------------------------------------------------------|
| ASME B31.3       | Process Piping                                                                                                                   |
| ASME SEC VIII D1 | BPVC Section VIII - Rules for Construction of Pressure Vessels - Division 1                                                      |
| ASME SEC IX      | BPVC Section IX - Qualification Standard for Welding and Brazing Procedures, Welders, Brazers, and Welding and Brazing Operators |

## 2.3. ASTM–American Society for Testing and Materials

|                   |                                                                                                               |
|-------------------|---------------------------------------------------------------------------------------------------------------|
| ASTM A 488/A 488M | Standard Practice for Steel Castings, Welding, Qualifications of Procedures and Personnel                     |
| ASTM B 111        | Standard Specification for Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock                 |
| ASTM B 111M       | Standard Specification for Copper and Copper-Alloy Seamless Condenser Tubes and Ferrule Stock (Metric)        |
| ASTM B 169/B 169M | Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar                                       |
| ASTM B 169/B 169M | Standard Specification for Aluminum Bronze Sheet, Strip, and Rolled Bar                                       |
| ASTM B 171/B 171M | Standard Specification for Copper-Alloy Plate and Sheet for Pressure Vessels, Condensers, and Heat Exchangers |
| ASTM B 584        | Standard Specification for Copper Alloy Sand Castings for General Applications                                |

## 3. Revisions to API Standard 619

All headings contained herein correspond to paragraph numbering within API STD 619-3, Third Edition, June 1997, and reflect additions, substitutions, modifications, and deletions. All provisions not modified or deleted remain in force.

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## Modifications to Section 1: Scope

### 1.0.d. Addition: Vendor Qualification

[I] Compressor systems shall be supplied by vendors qualified by experience in manufacturing the units proposed. To qualify, the vendor must have manufactured at the proposed point of manufacture, at least two compressors of comparable speed, power rating, and discharge pressure for a gas of comparable characteristics. These compressors must have been in service for at least one year and be performing satisfactorily.

Alternatively, the 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.

The critical areas relative to service conditions which shall be demonstrated to the satisfaction of the Owner's Engineer include, but are not limited to the following:

- 1) Pressure
- 2) Molecular weight
- 3) Volumetric capacity
- 4) Power rating
- 5) Speed
- 6) Temperature

The critical areas relative to mechanical design which shall be demonstrated to the satisfaction of the Owner's Engineer include, but are not limited to the following:

- 1) Sealing system
- 2) Bearing design and loading
- 3) Number of stages and staging arrangement
- 4) Casing size and design
- 5) Casing joint design
- 6) Rotor dynamics
- 7) Rotors structural design and performance
- 8) Material selection
- 9) Power Transmission components - design and arrangement

### 1.0.e. Addition

[I] In the area of component mechanical design, the vendor must show that each component has operated under the same conditions as those of the proposed compressor.

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