

RECOMMENDED BOLTING GUIDELINES

ASME B16.5

Gaskets	Bolting Materials Strength		
	High	Intermediate ^[1]	Low ^[2]
Elastomeric	Suitable	Suitable	Suitable
Rolled goods (beater-add, vegetable fiber, etc.)	Suitable	Suitable	Suitable
Compressed non-asbestos fiber	Suitable	Suitable	Suitable
PTFE	Suitable	Suitable	Suitable
Flexible graphite semi-metallic laminates (cut gaskets, corrugated metal gaskets, etc.)	Suitable	Suitable	Not Suitable
High-temp semi-metallic laminates (mica, vermiculite, etc.)	Suitable	Suitable	Not Suitable
Semi-metallic (spiral wounds, kammprofile, jacketed, etc.)	Suitable	Suitable	Not Suitable
Metallic (flat, ring joints, weld rings, etc.)	Suitable	Suitable	Not Suitable

NOTES:

- [1] Must be verified that sealed joint can be maintained under rated working pressure and temperature
 [2] Class 150 and 300 joints only, working temperatures of -20°F (min) to 400°F (max)

DEFINITIONS:

High strength materials include: ASTM A193 B7/B16, ASTM A320 L7 (low temperature service), etc. or related equivalents with allowable stresses not less than those of ASTM A193 B7.

Intermediate strength materials include: ASTM A193 B6/B8 Class 2/B8M Class 2, ASTM A320 B8 Class 2/B8M Class 2 (low temperature service), etc. or related equivalents.

Low strength materials include: ASTM A193 B8 Class 1/B8M Class 1, ASTM A320 B8 Class 1/B8M Class 1 (low temperature service), etc. or related equivalents with a maximum yield strength of 30,000 psi.

GENERAL GUIDELINES:

The type of bolting used should be suitable for the application as determined by a qualified individual and/or as specified by the end user. It is imperative that the strength of the bolting be suitable for the size and strength of the flanges to minimize the risk of any potential damage. Moreover, the appropriate gasket for the service must be determined by both the service conditions and the available clamping load (and sized accordingly) to ensure that adequate sealing stresses are generated to effect a seal without causing damage to the flanges or the gasket itself. This requires a great deal of care and attention.

In general, elastomeric gaskets and gaskets that contain elastomeric binders are most susceptible to overloading. When using these gaskets, especially at elevated temperatures, the use of high strength bolting materials should be done only after careful analysis of the applied torque to ensure the gasket stresses are below the material's crush point.

Conversely hard metallic and semi-metallic gaskets that are designed to resist high temperatures and pressures require a great deal of stress to seal. In most cases, these stresses can only be generated with high strength bolting materials. In any case, the amount of gasket stress is always inversely proportional to the sealing area (i.e. larger sealing area requires more load to generate the required sealing stresses and vice versa).

The above information is provided for general guideline purposes. For more detailed information, please refer to the latest revision of the ASME B16.5 specifications (in particular sections 5.3-5.4, Table 1B, and Table B-1).

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