Designation: F 2523 – 05

Standard Practice for Blowout Resistance of Room-Temperature Vulcanized Elastomers[1]

This standard is issued under the fixed designation F 2523; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice provides a means to determine the blowout resistance of a room-temperature vulcanized elastomer system (RTV) using a standard fixture.

1.2 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:* [2]

D 907 Terminology of Adhesives

D 1566 Terminology Relating to Rubber

F 2468 Classification for Specifying Silicone Adhesives and Sealants for Transportation Applications

2.2 *SAE Standard:*

SAE J1199 Mechanical and Material Requirements for Metric Externally Threaded Steel Fasteners[3]

3. Terminology

3.1 *Definitions*—Some terms in this practice are defined in Terminologies D 907 and D 1566.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *blowout*, *n*—disruption of the uncured RTV integrity in a joint from system pressurization resulting in sudden loss of pressure.

3.2.2 *T–joint*, *n*—interface created in a sealing surface where three structural components meet.

3.2.2.1 *Discussion*—This interface may exist as a small gap requiring a material such as room-temperature vulcanized elastomer (RTV) to seal.

3.3 *Acronym:*

3.3.1 *RTV*—room-temperature vulcanized elastomer

4. Summary of Practice

4.1 Condensation cures RTVs as a one-component system cure when exposed to moisture in the ambient air or as two-component systems when those components are mixed together. RTVs are often used to seal joints where three flanges meet (T joints) such as an automotive engine's front cover, engine block, and oil pan. Because of machining and assembly tolerance variations, these T joints may have a slight misalignment or gap. We also find gaps in the half-round area of the oil pan to block and in the valley between the intake manifold and block on certain V-engines as a result of manufacturing tolerances. The RTV is used to seal in fluids. In some assembly line applications, soon after the RTV is applied and the flanges fastened together, the system is subjected to an air decay test at a designated pressure. This test is used to determine an RTV's capability to withstand loss of integrity at this designated pressure.

4.2 When using this practice, one must first determine the maximum gap based on stack tolerances of the system. A two-piece round fixture uses the top portion to mirror the system gap, while the bottom half provides the mating flange and the connection for the pressure input. The gap is machined into the top half of the fixture in a "pie slice" 60° angle. A continuous bead of RTV is applied to the entire bottom portion of the fixture, the top half is carefully attached, and the fixture is pressurized to the prescribed limits and held for a specified time period. If the RTV is not capable of sealing at the pressure applied, a sudden loss of pressure will occur.

5. Significance and Use

5.1 This practice may be used to determine the viability of an RTV sealant to withstand pressure leak testing before cure at maximum gap conditions of a system. This practice may be used to indicate an RTV's acceptability to undergo an assembly line leak check without being disruptive to the sealant integrity.

[1] This practice is under the jurisdiction of ASTM Committee F03 on Gaskets and is the direct responsibility of Subcommittee F03.70 on Formed in Place Gaskets.
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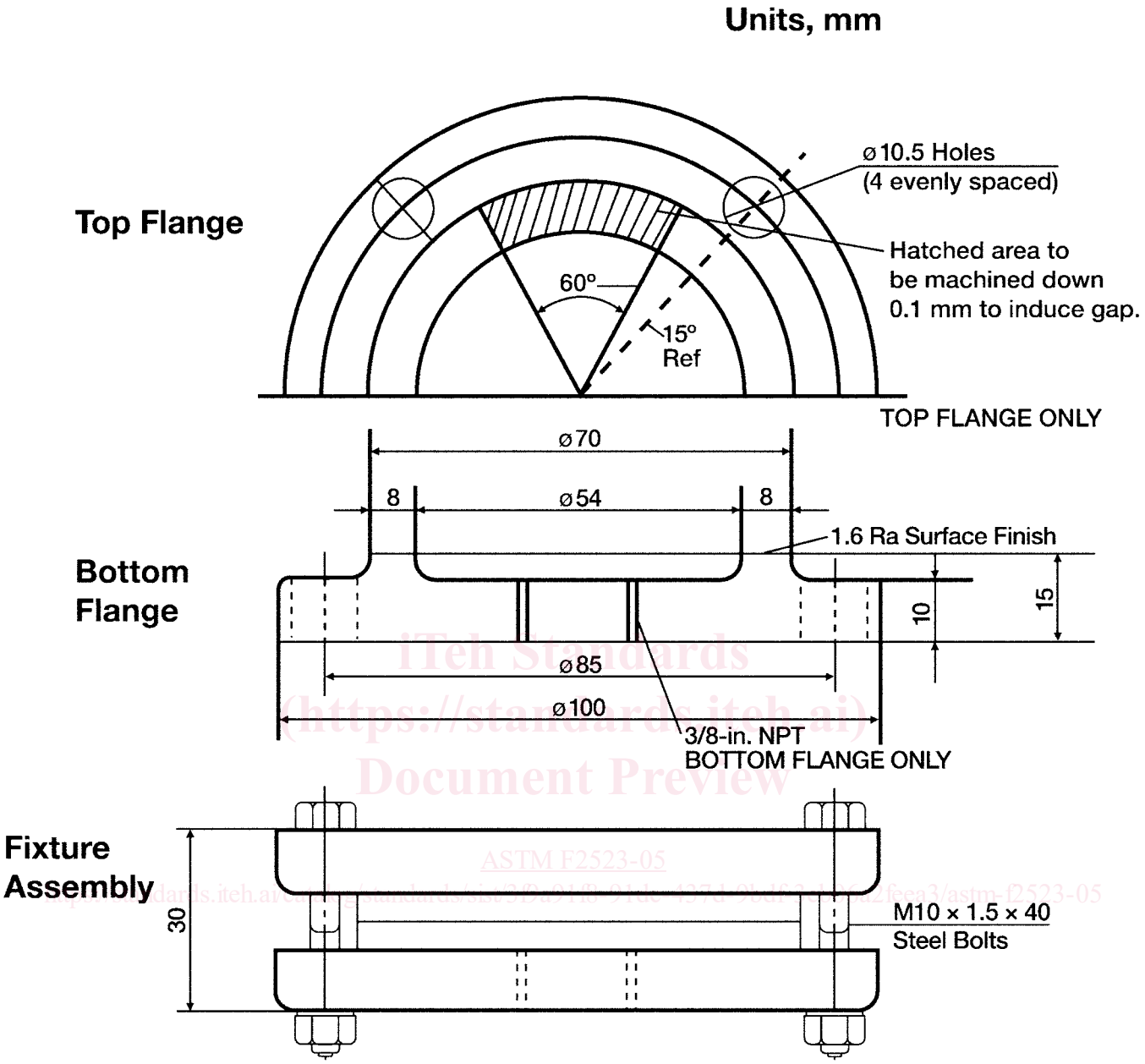
[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001.



Top and bottom flange are identical except for 0.1-mm clearance and 3/8-in. NPT hole.

NOTE—Torque sequence shall be "crisscross" pattern.

FIG. 1 Steel Blowout Fixtures

6. Apparatus [4]

6.1 *Fixture—Steel*, see Fig. 1.

6.1.1 Steel casting, forging, or bar stock with a 100 Brinell hardness, minimum.

6.1.2 Surface finish shall be in the range of 0.7 to 3.2 µm *Ra*.

6.1.3 Top half of fixture shall have a machined cutout to the desired gap depth per Fig. 1.

6.1.4 Four nut, bolt, and washer sets per SAE J1199 (4.8 hex head) or equivalent, M10 × 1.5 × 50.

[4] The sole source of supply of the blowout fixtures in both materials known to the committee at this time is Kovil Manufacturing, 925 Sherman Ave., Hamden, CT 06514. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.