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Standard Definitions of Terms Relating to Gaskets[1]

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1. Scope

1.1 This standard is a compilation of terminology, related definitions, and descriptions of terms used in the gasket industry. Included terms are those used to define materials, testing technology, and testing results related to gaskets.

2. Terminology

adhesion—the measurable attraction or bonding of a gasket material to a surface after the application of temperature, or compressive stress, or both. **F607**

annulus—a cut gasket shape consisting of two concentric circles of known geometry.

binder—a component of certain gasket materials, which solidifies the structure, imparts uniform adhesion to surfaces, and has an impact on the pore structure and resiliency.

blowout, gasket—the sudden release of internal pressure by a gasket sealing a flange with a given stress applied. The internal pressure needed to create a blowout is also known as the blowout pressure. **F434**

classification—a means of specifying categories of gasket materials according to composition, method of manufacture, mechanical characteristics, and physical characteristics. **F104**

combustibles—components of gasket material which are lost on ignition at a given temperature. **F495**

compressed thickness—the measured thickness of a gasket material with a known compressive stress applied.

compressibility—in compressibility/recovery testing of gasket materials, the difference between the specimen thickness under preload and thickness under total load, divided by the thickness under preload, expressed as a percent. **F36, F806**

compressive strength/crush extrusion resistance—maximum compressive stress before crush occurs at a specified temperature without regard for leakage. **F1574**

compressive yield—the point which the slope of the relationship between applied stress and deformation of a gasket material changes. **F1574**

creep—a transient stress-strain condition in which the strain increases as the stress remains constant. (This condition is approached in flat-face gasketing joints in which the bolt undergoes a high elongation relative to any creep that might take place in the gasket.) **F38**

creep relaxation—a transient stress-strain condition in which the strain increases concurrently with the decay of stress. (This is the most common condition existing in flat-face gasketing assemblies in which the bolt exhibits a relatively large amount of elongation.) Strain is related to material creep under the flange and stress is related to bolt stretch/elongation. **F38**

cross-sectional area—the area of a gasket specimen defined as the width times the thickness.

crush—maximum load capability of a gasket material has been exceeded by excessive external force, causing permanent deformation of the material matrix. This permanent deformation is normally exhibited as splits in the gasket material upon disassembly of the joint.

deflection—gasket material deformation in the "thickness direction" caused by the application of stress. **F1276**

deformation—the percentage by which a gasket material is deformed under stress or after the application of stress. **F1574**

density—the mass per unit volume for a given gasket material measured under defined conditions. **F1315**

description/line call out—an alphanumeric term used to define the composition, method of manufacture, mechanical properties, and physical properties of a gasket material. **F104, F868**

disintegration—the process by which a gasket material breaks up into components or fragments after exposure to a given fluid and/or environment. **F148**

durability—the resistance to disintegration of a gasket material after exposure to a given fluid and/or environment. **F148**

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extrusion—the measurable amount of permanent movement of a gasket material to unconstrained areas (that is, open flange edges) when excessive external forces are applied to all or part of the gasket matrix.

flange—the members of a gasketed joint that compress the gasket.

flange distortion—deviation of a contact surface from a perfect plane.

flange misalignment—an off-set between gasket flanges that can induce additional external "per unit area" forces upon a gasket due to less than design intent area under compression.

flanged joint—see **gasketed joint**, which is a preferred term.

flat faced joint—a joint or flange with no raised contact surface.

flexibility—the ratio of mandrel size a gasket material can be bent 180 degrees around without cracking to the thickness of said gasket material. **F147**

fluid—a gas or liquid used for immersion and sealability testing of gasket materials. **F37, F146**

gasket—a material that may be clamped between faces and acts as a static or dynamic seal. Gaskets are cut, formed, or molded into the desired configuration. They may consist of any of the following constructions:

(*a*) One or more plies of a sheet material;

(*b*) Composites of dissimilar materials; and

(*c*) Materials applied as a bead or other form to one or both mating faces prior to assembly.

gasketed joint—the collective total of all members used to effect a gasketed seal between two or more separate items.

leak—the passage of matter through interfacial openings or passageways, or both, in or around the gasket.

leak rate—the rate at which fluid escapes from a gasketed joint.

leakage—the amount of loss or escape of any media (fluid or gas) intended to be contained by the gasketed system.

linear dimensional stability—the degree to which a gasket material maintains its original size in the x-y plane after exposure to specific conditions.

maintenance factor, m—the factor that provides the additional preload capability in the flange fasteners to maintain sealing pressure on a gasket after internal pressure is applied to the joint.

manometer—a device used to measure pressure in a closed system. It may be used to measure leakage of fluids through gasketed joints.

peak load—the highest stress a gasket material can resist before tensile failure. **F152**

platens—rigid circular test plates drilled with a hole for the center bolt, used to compress the test specimen under specified load.

recovery—in compressibility/recovery testing of gasket materials, the difference between the specimen recovered thickness and thickness under total load, divided by the difference between the thickness under preload and thickness under total load, expressed as a percent.

relaxometer—assembly used in creep relaxation tests which consists of two platens, special drilled and calibrated bolt, washer and nut. **F38, F1276**

resiliency—in compressibility/recovery testing of gasket materials, the difference between the specimen recovered thickness and thickness under total load, divided by the thickness under total load, expressed as a percent.

sealability—the measure of leak rate a gasket material has for a given gasket geometry, fluid with applied internal pressure, and applied flange pressure. Typically reported as a volume or mass of fluid loss for a given time period and used as means of comparison. **F37**

strain—the deformation of a gasket specimen under the action of applied force or stress.

stress—The force per unit area applied to a gasket material.

stress relaxation—a transient stress-strain condition in which the stress decays as the strain remains constant. (This condition is encountered in grooved-face gasketing joints in which metal-to-metal contact occurs. This condition is also approached in flat-face gasketing joints when the bolt is practically infinitely rigid.)

tensile strength—the maximum tensile stress applied during stretching a specimen to rupture. **F152**

tensile stress—the applied force per unit on original cross-sectional area of a specimen. **F152**

torque bolt—a calibrated bolt (also called a drilled and pinned bolt) made of a defined alloy that contains a pin mechanism which allows the user to measure bolt stretch. The bolt is part of a relaxometer. **F38, F1276**

yield factor (minimum design seating stress, y)—the factor that represents the pressure in megapascals (or pounds-force per square inch) over the contact area of the gasket that is required to provide a sealed joint, with no internal pressure in the joint.