

FIRE-RATED ISOLATION GASKETS



Integra II SSAFS® **CATHODIC ISOLATION GASKETS**

Patent Pending



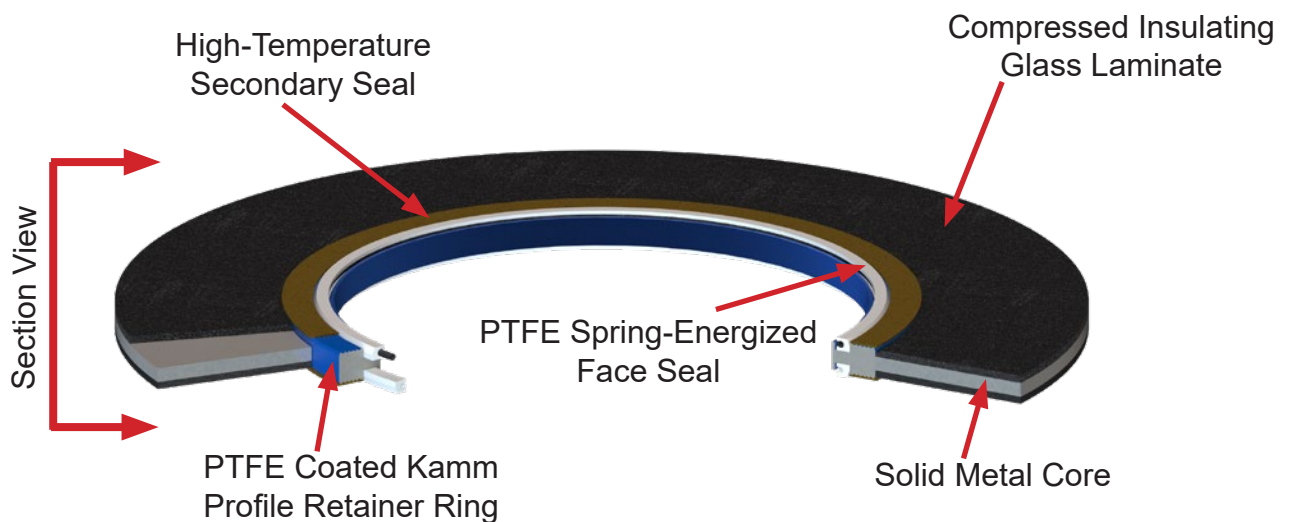
ISO 9001 CERTIFIED COMPANY - FM537405



WHAT IS INTEGRA II SSAFS® GASKET & WHY IS IT USED?

The patent pending Integra II SSAFS® isolation gasket was created to meet the demands of our customers for a non-metallic isolating gasket that could withstand the damaging effects of a fire. The SSAFS® was built upon the proven quality and durability of the Integra II SSA® gasket to ensure the most dependable sealing capability, even withstanding the severe API 6FB test. Isolation kits are available which include the fire safe gasket along with hardened steel isolation washers coated with our unique and highly durable, proprietary coating.

The new SSAFS® gasket combines the proven dependability of a PTFE pressure energized spring seal as the primary seal. The core of the gasket is 316 stainless steel, with permanently bonded insulating glass laminates adhered to both faces.



FEATURES & BENEFITS:

1. Exceptionally dependable for insulating and sealing purposes for severe service and fire safe applications.
2. Highly suitable for all severe service applications up to and including ANSI 2500# and API 10,000# classes.
3. Zero-free leaks for high sulfur content crude oil or H₂S gas fugitive emissions, proven through multiple applications.
4. Incorporates high temperature sealing characteristics of kammprofile with a highly dielectric mineral secondary seal.

APPLICATIONS:

- Critical fire safe applications
- Flange isolation with true cathodic protection
- Isolating between flanges of dissimilar metals to prevent galvanic corrosion
- Wellhead isolation from interconnected flow lines
- Mating mismatched dissimilar flanges
- Eliminate turbulence and flow-induced erosion between ring-joint (RTJ) flanges
- Protect against corrosion on uncoated or scarred flange faces
- To seal between flanges subjected to vibration/cavitations
- Eliminate corrosion from forming in the cavities between RTJ flanges where intense modes of hostile chemicals may be present

API 6FB TEST PROCEDURES

The API 6FB test is designed to measure the total leakage from a flanged connection over the duration of burn and cool down periods; and then repressurized. The assembly is monitored for leakage throughout the test, and it must not exceed an API prescribed leakage rate.

During the test, a fire is applied by a series of burners directing fire onto the assembly while it is pressurized to 75% of operating pressure. The flame temperature is monitored by a series of thermocouples inside the flame, and the flange temperature is monitored by evenly spaced calorimeter cubes measuring 1.5" and made of carbon steel. The test requires the flame temperature to reach 1400° F within 2 minutes and the calorimeter blocks to reach an average temperature of at least 1200° F within 15 minutes of fire ignition. After the 1200° F minimum is reached, the temperature must be maintained above this point for the remainder of the burn period.

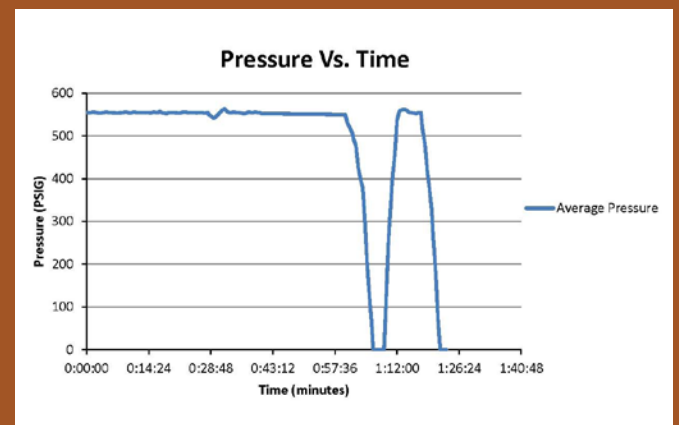
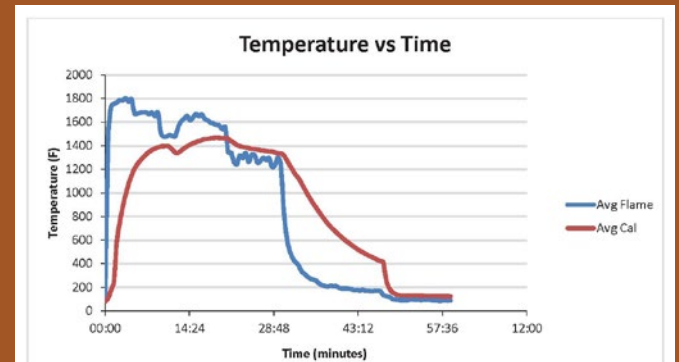
At the end of the 30 minute burn period, the fire is shut off, and the assembly is allowed to cool while maintaining pressure. Once the assembly has cooled to 212° F or less, it is then repressurized for a minimum of 5 minutes.

SSAFS® API 6FB TEST RESULTS

According to the API standard 6FB, nonbending, onshore or open offshore fire test the SSAFS® gasket kit was able to maintain a fire safe connection throughout the entire test. The measured leakage rate during the burn and cooldown periods was 13.63 ml/min, compared to an allowable leakage rate of 24.73 ml/min. The measured leakage rate during the repressurization period was 0 ml/min.

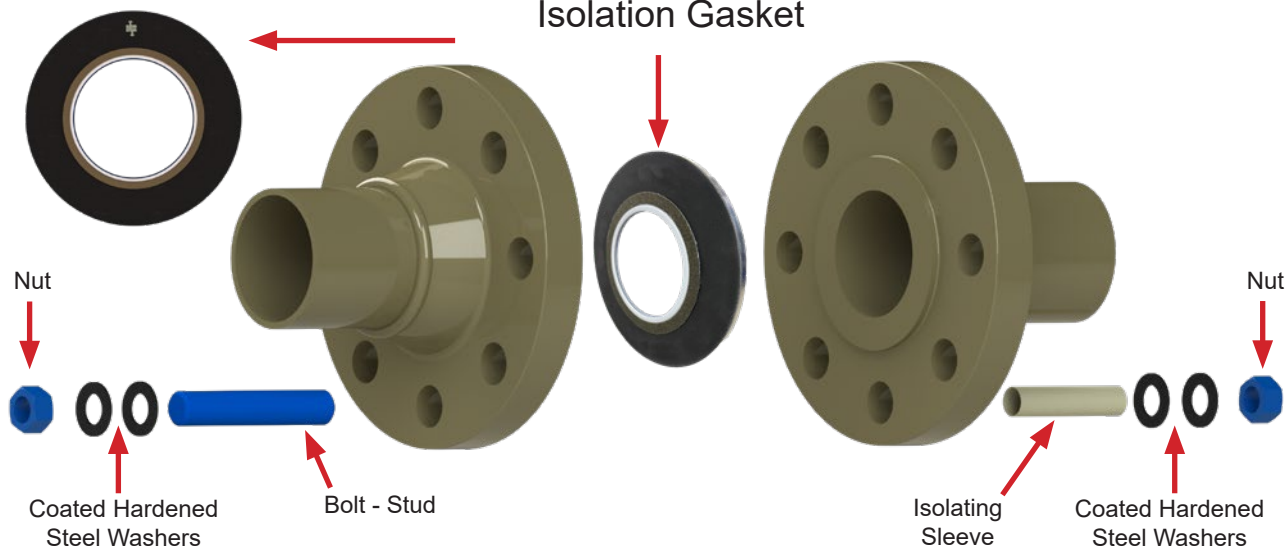
The test was performed with a 6" 300# Integra II SSAFS® Gasket Isolation Kit with G10 sleeves and coated hardened steel washers. The flanges were standard 6" 300# made of carbon steel, and the hardware was standard B7 studs with 2H nuts.

<p align="center">Fire Test Report</p> <p align="center">In Accordance with</p> <p align="center">API Standard 6FB, Third Edition</p> <p align="center">Performed for</p> <p align="center">Advance Product & Systems Inc.</p> <hr/> <p align="center">6 inch Class 300 Integra II Fire-Rated Isolation Gasket CS Flange/ B7 Studs/ 2H Nuts Dielectric Sleeves/ Coated Hardened Steel Washers</p> <p align="center">Start Date: October 28, 2015 End Date: October 28, 2015</p> <hr/> <p align="center">Performed by</p> <p align="center">United Valve</p> <p align="center">9916 Gulf Freeway Houston, TX 77034 Phone: 713-944-9852 Fax: 713-944-5964 www.unitedvalve.com</p>
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Isolation Gasket



G-10 Standard SSA S/S Retainer
Material Specifications

NEMA Grade
Compression glass reinforced epoxy laminate material:

Compressive strength	66,000 PSI
Dielectric strength.....	800 VPM
Max. continuous operating temp.....	302° F (150° C)
Water absorption	0.04%
Flexural strength.....	65,000 PSI
Tensile strength	51,000 PSI
Bond strength	2,600 lb.
Shear strength	22,000 lb.

G-11 Optional SSA S/S Retainer
Material Specifications

NEMA Grade
Compression glass reinforced epoxy laminate material:

Compressive strength.....	58,000 PSI
Dielectric strength.....	550 VPM
Max. continuous operating temp	400° F (205° C)
Water absorption	0.08%
Flexural strength.....	58,000 PSI
Tensile strength	41,000 PSI
Bond strength	2,200 lb.
Shear strength	21,200 lb.

Seal Material

The sealing element is intended to provide a nonpenetrating barrier through which no restricted retained matter or other substance can pierce. As a result, the glass composite retainer material permanently holds the seal in place in a static, fully encapsulated manner. Dual spring energized PTFE seals are available for very high pressures or large diameter flanges.

Standard PTFE Seal Material: PTFE (Spring-Energized)

Designed for multiple applications, a radial load is provided by the helical wound spring. Encapsulation in the seal groove eliminates creep or cold flow. This PTFE spring energized sealing element is manufactured from a special formulated PTFE material which is machined with a wider surface area promoting a constant seal.

Temperature range is from -250° F to +350° F (gasket material is limiting factor)

High Temperature Secondary Seal Material: Phyllosilicate

Designed for general oil and gas applications, this sealing material is used for maintaining a durable seal in the event of a fire.

Maximum temperature: 1292° F
Dielectric strength: 635 V/mil
Tensile strength: 20,300 psi

Isolating Sleeve Options

G-10 - Glass reinforced epoxy tubing is suitable for continuous exposure to 350° F. This material is an epoxy laminate that offers excellent resistance to crushing, cracking, breaking and thread pinch.

G-11 - Glass reinforced epoxy tubing is suitable for continuous exposure to 400° F. This material is an epoxy laminate that offers excellent resistance to crushing, cracking, breaking and thread pinch.

Mylar - Spiral wound Mylar is a general purpose material recommended for bolting applications with flange temperatures below 300° F. This material has generally fair resistance to crushing, cracking, breaking and thread pinch.

Nomex - Spiral wound Nomex tubing is suitable for continuous exposure to 450° F. This material has a dielectric strength of 550 V/mil, and has generally fair resistance to crushing, breaking and thread pinch.

Isolating Washer: Coated, Hardened Steel Washer

Designed for multiple applications, and to withstand torque and dielectric requirements. Coating offers excellent resistance to crushing, cracking and breaking. The steel washer is made from Grade 1050 and heat treated per ASTM F436.

ISOLATION GASKET TECHNICAL SPEC

The gasket and its components for use on pipes containing water, aqueous fluids, oil, sour or natural gas, shall be manufactured as follows.

The gasket provides isolating and sealing between two flanged connections. Integra II SSAFS®, .334" uncompressed thickness and .274" compressed thickness, contains a 316 stainless steel core and NEMA grade G-10 or G-11 fiberglass reinforced laminate permanently bonded to both side. The precision machined groove provides a controlled compression of an engineered PTFE spring energized seal. The PTFE seal is located so as to provide sealing for either flat, raised or RTJ face flanges, and

also shall be pressure and spring energized. The gasket also contains precision machined and PTFE coated kammprofile serrations on both side with a fire safe phyllosilicate seal covering each. The placement of the kammprofile serrations shall provide fire safe protection for either flat, raised, or RTJ face flanges. The fiberglass reinforced laminate has a dielectric strength of 800 V/mil (G-11: 550 V/mil) and a maximum compressive strength of 66,000 psi (G-11: 58,000 psi). The gasket ID has a diameter that matches the flange ID in which it is installed. The gasket shall have a max operating temperature of up to 302 °F with G-10 laminate (400 °F with G-11).



GASKET ISOLATION KIT

Accompanying the Integra II SSAFS® isolation gasket are our hardened-steel isolation washers coated with our unique and highly durable, proprietary coating. This coating exhibits exceptional dielectric strength and is tough enough to withstand the required torque applied. These washers also help to prevent torque loss during the burn period of the API 6FB fire test.

These washers are not only useful for fire safe applications but are also available and beneficial for use with our other isolation kits. All coated steel isolation washers are reversible and can be installed in any direction, which eliminates the potential of a backwards installation.

MECHANICAL PROPERTIES

1. Steel Washer:
 - a. Material per ASTM F436
 - b. Hardness: HRC 38 – 45
2. Coating:
 - a. Durable, proprietary blend to provide excellent corrosion resistance along with exceptional abrasion resistance.
 - b. Low coefficient of friction
 - c. Dielectric strength: 875 V/mil
 - d. Minimum operating temperature: -100° F
 - e. Maximum temperature: 400° F

ISOLATION TEST RESULTS

1. Double washer configuration installed on unpainted flange.
 - a. Flange – Flange Resistance:
 - i. Initial 28 GOhms
 - ii. 1st bolt-up 650 MOhms
 - iii. 2nd bolt-up 550 MOhms
 - iv. 3rd bolt-up 605 MOhms
 - b. Flange – Bolt Resistance:
 - i. Initial 137 GOhms
 - ii. 1st bolt-up 64 GOhms
 - iii. 2nd bolt-up 57 GOhms
 - iv. 3rd bolt-up 51 GOhms

To order a complete Fire-Rated Isolating Gasket Kit, please specify the following

1. Flange Specification
(ANSI/ASME, API, MSS SP44, BSI,
or Din Standard)
2. RTJ or Raised Face
3. Nominal Pipe Size, Pressure Rating,
& Bore Size
4. Operating Pressure, Temperature, & Media
5. G-10, G-11, Mylar, or Nomex Materials

Other Products Available

Standard Isolating Gasket Kits
Kleerband® Flange Protectors
Radolid® Nut & Bolt Protection Caps
Casing Spacers and End Seals
Innerlynx® Modular Mechanical Seals
IsoJoint® Monolithic Isolating Joint
Forman Nite Caps Pipe Plugs
UBolt-Cote® & Atlas Pipe Support® Pads
Wall Sleeves



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The "FS" or "Fire Safe" designation denotes only that this gasket has successfully passed the API 6FB fire test. Due to the fact that every fire is unique and many uncontrolled variables are present, no other claims regarding suitability or performance in a fire are made. Each designer, user and/or operator will need to assess their individual situation when deciding to install FS style gaskets.

**PATENT PENDING

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