

NOW WE'RE TALKIN'

FABW

Flange Assembly & Bolting Workshop

The best way to improve overall gasket performance and trim your maintenance costs is to learn and follow best practices in gasket installation. Flexitallic offers hands-on training that has earned raves from maintenance supervisors around the world.

Flexitallic

Flexitallic

IS THERE A PROBLEM?

Sealing
Solutions
for the
Power
Generation
Industry

Some of the FABW's topics include:

- Hands-On Craft Skill Development • Bolting Demonstration
- The Effect that Gasket Type and Assembly Approach Have on Joint Assembly • Augmenting Existing Training • Real-Time Response and Display of Bolt Loading • Understanding Gasket Response to the Applied Loads
- Gasket Responses to Overloading • Inward Radial Buckling • Assembly Practices • Gasket Seating Stress • Relation to Bolt Load • Evaluating Different Gasket Types and Designs

FOSSIL FUEL POWER GENERATION

Don't let the pressure and the heat get to you.

Graphite begins to oxidize at around 650° F*,
you're running at 850° F.

No problem.

Graphite oxidizes at high temperatures. So gaskets made with graphite deteriorate as well. **Thermiculite®** (800 Series), the revolutionary sealing material from **Flexitallic**, maintains its integrity up to 1800°F (982°C). It prevents the loss of bolt load, which can be very costly—and, ultimately, dangerous. Oxidation of graphite gaskets has been evident in main steam valves, steam extraction valves, throttle valves, check valves, and other critical equipment in power plants.

*The Tightness Testing Research Laboratory (TTRL) at École Polytechnique in Montreal on behalf of the Pressure Vessel Research Council (PVRC) performed independent testing to show that the maximum service temperature for graphite in long-term service is much lower than that quoted in manufacturers' literature. See results at www.flexitallic.com

2X

Winding with twice the springback. Here's an answer for differential thermal expansion and contraction, bolt relaxation, axial deflection or cyclic conditions and high temperatures—Inconel X-750 winding material. In a test to improve a main closure gasket for a reactor coolant pump, spiral wound gaskets manufactured with our exclusive precipitation-hardened Inconel X-750 were shown to have more than 2X the springback compared to standard 316L SS.

The power industry is using **heat-treated Inconel X750** spiral wound gaskets in:

- Valve Body-to-Bonnet Joints
- Check Valves
- Turbine Stop Valves
- Steam Generator Manways
- Reactor Coolant Pumps
- Moisture Separator Reheater Manways
- Heat Exchangers
- Strainers

Scratch led to a leak, which led to a **SUPRANITE MGM GASKET**

A nuclear facility's engineers discovered notching of a flange surface. Difficult to re-machine, they tried increasing the torque value on the spring-type gasket in place, but during qualification of the circuit it leaked. So they replaced with an expandable graphite gasket—a Supranite MGM. Under the same bolting and torque values the problem was solved—so they standardized the highly elastic Supranite MGM. That trend continues around the world—in a wide variety of assemblies and under a range of pressures and temperatures. Get the test results that show you just how valuable these gaskets are in metal-to-metal applications.

(Yeah, right.)

That's one of those dusty quips that really doesn't apply anymore. Especially in an industry with the regulatory, safety and cost-containment issues of power generation. Whether fossil-fired or nuclear, you can't afford to have a seal creep, leak, unwind—break. Today it's all about anticipating potential problems, before they get real.

Gaskets may not be top of mind. If you were going to improve the overall efficiency of your facility's systems, maybe flange and valve sealing are not the first places you'd look. The gasket is probably one of the least expensive and least considered items in any power plant. However, if improperly specified or installed, that changes—often resulting in a disproportionate amount of expense along with health and safety issues.

We're trying to make your life easier, honest. We're not here to create problems. In fact, what follows will be more in the category of "opportunities." Chances to cut maintenance costs. Prevent FME's. Reduce the risk of blowouts.

We like to solve problems. Flexitallic introduced the first spiral wound gasket (almost a century ago) and we've continued to innovate. For example, **Thermiculite®** is a revolutionary material that simulates the structure of exfoliated graphite, with one very important exception—it doesn't oxidize like graphite, rather it maintains its integrity up to 1800°F (982°C).

Take a look. Flexitallic can address specific issues in both fossil fuel and nuclear power generation. To get details and see all the products in each gasket line, visit **www.flexitallic.com**.

FLEXITALLIC TO THE RESCUE

Save it with our flange rescue gasket. If you have pitting/corrosion/erosion between the gasket I.D. and the bore of the flange (e.g., service water, salt water, or fire water systems), here's a rescue strategy. Use a gasket that can seal the problem immediately and prevent against further damage. There is no need for specialized equipment. You minimize exposure time in hot areas and eliminate the expense of in-situ machining and reworking. For non-standard flanges, a combination of circular and non-circular shapes can be manufactured.

FLEXPRO

Put an end to chronic pain.

You know those troublesome applications where “the what” your using is not the answer, but you don't have a better alternative?

Try our **Flexpro**® gasket, it's a cost-effective alternative to your current gasket—especially in those flanges with limited bolt load or of a lighter weight. **Flexpro** delivers the compressibility of a sheet gasket, the sealability of a spiral wound gasket and the ease of handling of a solid metal gasket—with no buckling during installation or in service. It's available as a segmented gasket for easy replacement without tear down—and it can be refurbished!

Flexitallic can improve your sealing capacity in:

- Residual Heat Removal Exchangers
- Moisture Separator Reheater Manways
- Feedwater Heaters
- Steam Generator Blowdown Heat Exchangers
- Check Valve Lids and Hinge Pins
- Valve Body-to-Bonnet Joints
- Standard ASME Tongue and Groove Flanges
- Steam Generator Gland Seals
- Steam Generator Manways
- Pressurizer Manways
- Letdown Heat Exchangers

For example, **a boiler manway door may not be centered** creating an excessive gap in one quadrant that allows the gasket to extrude—possibly springing apart and resulting in leakage or gross blowout. **Our exclusive MCS spiral wound gasket** has an inner ring that centers the gasket and acts as a compression stop—preventing overcompression and **keeps the gasket centered on the door.**

Stop Buckling

Flexitallic CGI series — spiral wound gaskets with all the breakthrough heat and chemical resistance of Thermiculite, but with an inner ring to protect against deterioration and resulting FMEs.

Stop Teardown

Turn a six-day teardown into a six-hour change-out. Order a segmented **Flexpro** gasket and replace a gasket in a fraction of the time. Perfect for large equipment where space is tight. Park heavy duty equipment or shorten your team's stay in a high-rad area. Get in and out quickly and safely with **Flexpro** segmented gaskets—available in a wide range of sizes.

Sigma 600

Sigma 600—an actuator's best friend. **Flexitallic** takes high-performance sealing to another level with the introduction of SIGMA 600. Ideal for lube oil systems and actuators, our proprietary manufacturing process creates this biaxially orientated **R₂PTFE** gasket material. The unique restructuring process requires no filler materials and delivers dimensional stability for long-term sealing integrity.

ENOUGH

EXTEND THE LIFE

of your heat exchangers and turbines.

When you need operational flexibility combined with rigorous heat resistance, consider **Thermiculite 715** and **Thermiculite 815**. Both are available in sheet and gasket forms for use in a wide range of applications including: turbine crossovers, flanges, and heat exchangers. Thermiculite 715 and 815 meet API 6FA fire test standards—so they don't oxidize from exhaust or hot air. Which is why they are being used to replace Aramid Fiber, Inorganic Fiber, Carbon Fiber, and Graphite gaskets around the world.

NO MORE LEAKS

End the leaks. Eliminate FMEs.

Foreign Material Exclusion (FME) is a regulatory focus. Guidelines from the Institute of Nuclear Power Operations urge maintenance supervisors to:

“Prohibit the use of metallic crush-style gaskets without an inner metal ring and purge them from the spare part inventory.” Why? “Buckling or springing of spiral wound gaskets can result in winding and unraveling with debris entering the flow stream.” Full text of the more precise language from the ASME guidelines is below.

Previous Language: Inner rings shall be furnished with all spiral-wound gaskets having PTFE filler material. Since there have been reports of inward buckling of gasket windings with other filler materials, it is recommended that inner rings be specified by the user for materials where his experience has shown inward buckling of the gasket.

New Language in 2008 Edition: Inward buckling of spiral-wound gaskets has been identified as a potential problem. Inner rings shall be furnished with all spiral-wound gaskets having PTFE (polytetrafluoroethylene) filler material. Inner rings for flexible graphite filled spiral wound gaskets shall be furnished unless the purchaser specifies otherwise.

-ASME B16.20 Para 3.2.5