Emissions

There is certainly a great deal of interest in limiting emissions of the numerous chemicals and other substances regulated under the Clean Air Act. Garlock has performed testing in this area and our report, available on request, covers the effects of gasket type, compressive load, internal pressure and flange finish on relative emissions levels. The use of heavier flanges where possible and the selection of premium gasket materials with good sealability numbers are the easiest ways to reduce emissions.

FDA

Style 3500 (Fawn) and **Style 3510** (Off-White) comply with FDA regulation 21CFR177.1550. They meet ingredient and extract requirements. The fillers are also acceptable under 21CFR177.2600 and coloring agents (where used) under 21CFR178.3297. The branding ink complies with 21CFR175.300. Style 3500 (Fawn) has USDA approval for direct contact in meat and poultry applications.

Style 3504 (Blue), **Style 3565** (ENVELON®), **Style 3591** (Gold), and **Style 3594** (Green) comply with FDA regulation 21CFR177.1550. They meet the ingredient and extract requirements. The filler is listed in the Food Chemicals Codex (FCC 3rd Edition) and is considered GRAS (generally recognized as safe – 21CFR170.30). The branding ink complies with 21CFR175.300.

Style 3522 (Clear) complies with FDA regulation 21CFR177.1550.

The ingredients for **Style 3540** (Microcellular) and **Style 3545** (Microcellular with Rigid Core) comply with FDA regulations 21CFR177.1550, 21CFR182.1, 21CFR182.1217, and 21CFR175.300. The branding ink complies with 21CFR175.300.

The PTFE resins used in **Style 3535** PTFE joint sealant comply with FDA regulation 21CFR177.1550. The PSA tape used to hold the joint sealant material in place meets 21CFR175.105.

Fire Tests

Garlock has developed a Fire Test Standard modeled after industry fire tests API 589 and 607. Styles G-9900, 9800, 9850, ST-706, IFG® 5500 and GRAPH-LOCK® styles have all passed this fire test. Test procedures and results are available upon request.

Flanges

Flanges come in all shapes and sizes, and the type of flange used in a service has a large impact on the type of gasketing material recommended. Standard ANSI raised face flanges are best suited for use with compressed fiber and GYLON® gaskets. Elastomer (rubber) gaskets may be crushed in these flanges.

Flat faced non-metallic flanges seal best with elastomeric (rubber) gaskets, such as the various STRESS SAVER® gasket styles. GYLON® Style 3545 may also be suitable for some applications. Compressed fiber and standard GYLON® are frequently used in flat-faced carbon steel flanges, but the compressive stress available in these flanges is well below our minimums. The result is that the gaskets are compressed very little; if there is a significant flange irregularity present, the gasket may not seal. Since leakage rates of gaskets depend on the available compressive stress, the joint may not be as tight as the customer would like.

Glass-lined flanges are found in many chemical applications. Due to the inherent "waviness" created when these flanges are fired to apply the glass, the softer GYLON® styles such as Styles 3545, 3565, and 3504 are preferred. The gap between the flanges, when placed together empty, must be measured before the gasket is ordered. Gasket thickness should be four to five times the maximum gap observed.

Stainless steel (SS) flanges are common in many plants for chemical service, and often utilize low strength SS bolts. Due to the chemicals present and the low compressive stress generated by the bolts, Styles 3545, 3565, and 3504 are often recommended. We do prefer, however, the use of high strength, strain-hardened stainless steel bolts.

Flange Finish

We recommend the flange finish conform, whenever possible, to 30-55 serrations per inch, in a concentric or spiral pattern, cut with a 1/16" radius, round-nosed tool. This finish is usually difficult or impossible to create in non-circular flanges. We recommend that machined surfaces which can not be serrated have a surface finish with a multi-directional lay and roughness of 125-250 micro-inch RMS.

Fuel Additives

The chemical MTBE (methyl t-butyl ether) has become a very common fuel additive and gasketing compatibility inquiries on this material are frequent. Garlock in-house testing has shown GYLON® gasketing to be unaffected by MTBE. We have also found compressed sheet Styles 9850 and 3000 to be suitable for MTBE service. These materials are recommended for MTBE alone or mixed with gasoline.