

## Selection Guide for Metal Detectable Sanitary Gaskets and O-Rings

Government regulations require that food, beverage and pharmaceutical manufacturers keep foreign material out of their products to ensure that their products are safe for human consumption. This is best done by first preventing extraneous materials from entering the process stream but it is also critical to detect any contaminants that may have entered the product before they leave the production facility.

Sanitary Gaskets and O-Rings used in food, beverage and pharmaceutical production equipment can be damaged during installation or deteriorate over time due to exposure to continuous vibration, extreme temperatures and corrosive chemicals. A deteriorating gasket or o-ring can create particles that break off and enter the process stream and contaminate the product.

To combat this problem, gasket and o-ring manufacturers have developed products that contain special metallic filters and additives that will allow particles of these products as small as 2mm to be picked up by in line metal detectors and X-ray equipment. Many of these products are FDA compliant. Be aware that some products are both metal detectable and x-ray identifiable but others are not. If you require both metal detectable and x-ray identifiable gaskets and o-rings, be sure to specify your requirements.

Metal detectable gaskets and o-rings are available in the following elastomeric materials:

- Ethylene-propylene (EPDM)
- Fluoroelastomer (FKM)
- Nitrile/Buna (NBR)
- Sanifluor® (TFE-P)
- Silicone (VMQ)

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**Fluoroelastomer (FKM)** (common name Viton®) is a copolymer of vinylidene fluoride and hexafluoropropylene. They typically have a fluorine content of about 66%. Fluoroelastomers have an operating temperature range of -4°F (-20°C) through +400°F (+205°C) and a broad degree of chemical resistance. Fluoroelastomer is normally not the best choice for applications involving hot water or steam. Fluoroelastomer compounds perform well in CIP fluids, fatty food products, food grade lubricants and oils.

**Ethylene-propylene (EPDM)** EPDM is a terpolymer of ethylene, propylene and a diene third monomer used for cross-linking. EPDM has an operating temperature range of -60°F (-51°C) through +300°F (+150°C). EPDM is very effective when sealing against hot water and steam. EPDM has good resistance to mild acids, alkalis and alcohols. It is not recommended for solvents, petroleum products and most oils. EPDM performs well in most dairy applications and with WIFI (Water for Injection) at high temperatures.

**Nitrile/Buna (NBR)** is a copolymer of Acrylonitrile and Butadiene. It has an operating temperature range of -30°F (-34°C) through +200°F (+93°C). NBR is considered a general purpose material. It seals effectively against alcohols, alkalines, diluted acids, water, mineral oil and vegetable oil. Nitrile/Buna is generally not a good choice for SIP and CIP processes.

**Sanifluor® (TFE-P)** is an AFLAS® formulated compound that is FDA and USP Class VI compliant. Sanifluor has an operating temperature range of +23°F (-5°C) through +450°F (+230°C). Sanifluor has very good chemical and steam resistance and is highly recommended for SIP and CIP applications. It has lower TOC's and metal extractables than Viton® compounds.

**Silicone (VMQ)** can provide reliable service at temperatures ranging from -175°F (-115°C) through +480°F (+250°C). It does have good compression set characteristics. Silicone elastomers have relatively low tensile strength and poor tear and wear resistance. Silicone is suitable for use in hot water, animal and plant fat, some lubricants and glycerin. Generally silicone is not recommended in acids, alkalis, esters and steam above +212°F (+100°C) because of the potential for chemical degradation.

Selecting the optimum metal detectable/x-ray inspectable gasket or o-ring for any given applications will lengthen the time between replacements and greatly reduce the possibility of premature failure.

***The Sealdetect™ brand of the Sanitary Seal Division of PTI, Inc, includes a full line of metal detectable/X-ray inspectable sanitary gaskets, o-rings and cord. Contact us today to speak with us about any of our sanitary sealing products for your applications. TEL 610-603-754 or visit us at [www.sanitarygasket.org](http://www.sanitarygasket.org).***

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