

GUIDELINES FOR THE SELECTION AND SPECIFICATION OF FLUOROELASTOMER (VITON®, FKM) MATERIALS

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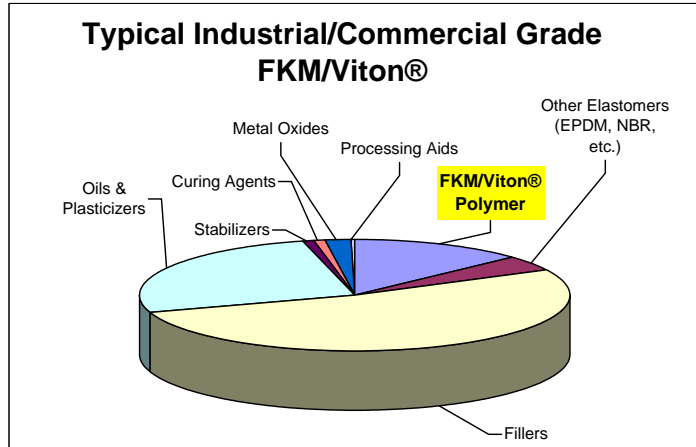
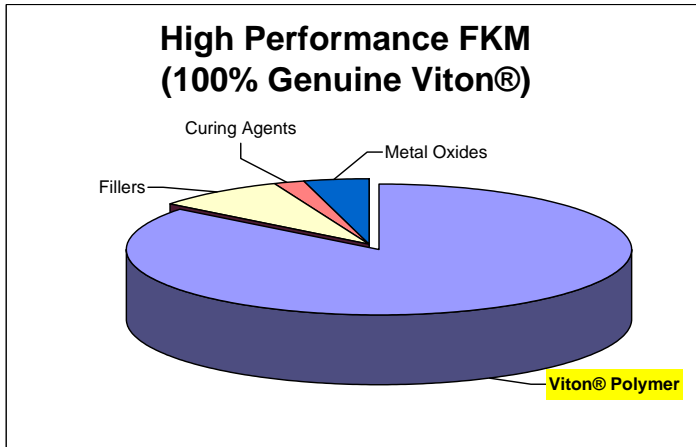
Natural and synthetic elastomers offer a variety of desirable mechanical and elastic properties, however they typically offer only a narrow range of chemical compatibility. In order to expand the range of chemical compatibility, fluorine atoms are introduced to the base elastomer structure. The relative electro-negative charge of the fluorine atoms and the extremely strong, stable bond that is developed with the carbon atoms within the elastomer together provide dramatically improved, very broad chemical compatibility. This class of elastomer is referred to as "FLUOROELASTOMERS", and is assigned the generic ASTM D2000 designation of "FKM". Viton® from DuPont Performance Elastomers is the most widely known fluoroelastomer tradename.

There are different levels of fluorination that results in different styles of FKM fluoroelastomer; Each one offering different levels of chemical resistance.

Viton® Style	Fluorine Content	Effect On Chemical Compatibility Ratings			
		Alkyl Alcohol	Caustic Soda	Fuming Sulfuric Acid	Sulfur TetraFluoride
Viton® A	66% Fluorine	D- Rating	D- Rating	B- Rating	C- Rating
Viton® B	68.5% Fluorine	B- Rating	C- Rating	A- Rating	B- Rating
Viton® F	69.5% Fluorine	A- Rating	B- Rating	A- Rating	A- Rating

Higher fluorine content in the elastomer produces greater chemical compatibility, so Viton® F will provide better chemical compatibility than Viton® B which provides better compatibility than Viton® A

FKM (Viton®) fluoroelastomers are supplied to compounders in a "gum" (pure) state. These fluoroelastomer "gums" must be compounded with several other materials and "cured" to produce a properly cross-linked fluoro-elastomer sheet or o-ring. The relative ratio of FKM "gum" to all of the other materials in the compound should be in the range of 85% to 60% by weight, however to reduce cost, there are some grades with an FKM content as low as 1% to 17%. As a result, there can be considerable variation in chemical compatibility within the same grade of FKM elastomer products made by different compounders.



Lacking any industry compounding standards, elastomer compounders are free to vary the types and amounts of all constituents within the elastomer products they manufacture. The result is a wide, confusing array of different grades of Viton® and FKM sheets and o-rings identified as "Premium" grade, "Industrial" grade or "Commercial" grade. Typically, the lower "grades" of FKM or Viton® materials are compounded with minimal amounts of fluoroelastomer polymer, and an overabundance of processing aids, fillers and even other elastomers such as Neoprene or Nitrile. Users of low grade fluoroelastomer materials should be aware of the chemical compatibility limitations that are encountered with this grade of material.

Chemical resistance and thermal stability of fluoroelastomers are further influenced by the curing process whereby the polymer chains are "cross-linked". The type of curing agent used, and the degree of control over the curing process both have a dramatic effect on the resultant chemical and thermal properties. In general, a proper post-curing process produces the best crosslinking bond density which in turn results in a fluoroelastomer with better compression set resistance, higher temperature limits, and improved chemical resistance compared to one that has either not been post cured at all, or has been inadequately post-cured.

DuPont Genuine Viton® Licensees- Ensuring The Integrity Of The Genuine Viton® Supply Chain

Virginia Sealing Products, Inc. has been selected by DuPont Performance Elastomers as a Genuine Viton® Licensee, and is certified to source, fabricate and supply Genuine 100% Viton® to our customers. As a Genuine Viton® Licensee we are approved by DuPont Performance Elastomers to employ this mark as assurance that the fluoroelastomer parts are manufactured and compounded to provide the highest chemical, thermal and mechanical performance. Only DuPont approved Viton® compounders and compounds are supplied by VSP as Genuine Viton®.



If your process or application requires Viton®, make sure that you receive 100% Genuine Viton®, and not an inferior blend. Specify 100% Genuine Viton®, and require parts be packaged with the Genuine Viton® mark.