



For Immediate Release



Renewable Fuels Safety Advance - Carolina Seal, Inc. & McKenzie Valve & Machining Co. Cooperate to Help Prevent Fuel Ethanol NAR's

Charlotte, NC: February 2008 – Carolina Seal, Inc., a leading supplier of O-Rings and Valve Repair Kits for the tank car industry, and McKenzie Valve & Machining Co., a leading supplier of tank car valves and components, are pleased to announce the results of a joint initiative aimed specifically at helping reduce the number of O-Ring related NARs, (Non-Accident Releases), in Fuel Ethanol transportation by rail. Both companies are pleased to acknowledge that this initiative is supported by the **Renewable Fuels Association**.

Application compatibility is one of the largest concerns when specifying O-Rings in valves and fittings. The O-Ring selection process for Rail applications encompasses three elements; compatibility of seal material for specific commodities, service temperature range, and pressure range. Specifically in Fuel Ethanol sealing applications, it is critical to evaluate the denaturants as well.

There is confusing, and often conflicting data in the marketplace surrounding the chemical compatibility rating of O-Ring materials with specific commodities. Having invested countless hours researching specific commodities for their railcar customers, one cardinal rule Carolina Seal has used consistently is to be conservative when making a material recommendation. Only top rated, ("1" or "A" rated), materials are recommended. MV&M shares this philosophy and uses superior materials in their standard valve offerings.

Fuel Ethanol transportation into colder regions requires lower temperature rated sealing materials. The lower temperature limits for elastomers are highly conditional and vary by specific compound. MV&M and Carolina Seal have evaluated much of the available data, and created the attached chart, which illustrates both the compatibility information and the general temperature limits applicable to a variety of Fuel Ethanol mixtures. This chart can be used as a general guideline when selecting sealing materials for Fuel Ethanol transportation.

As noted earlier, Denaturants, which can be the most significant factor in evaluating a seal's life and performance in Fuel Ethanol applications, are often overlooked. Denaturants can vary widely and are listed under 27 CFR 19.1005(c). The chemical compatibilities of these denaturants are not always consistent with the chemical compatibilities of pure Ethyl Alcohol. These denaturants are used in low percentages, (typically 2%-5%); however, to "error on the side of caution", MV&M and Carolina Seal generated the following compatibility chart, based on both the Denaturant as well as pure Ethanol (Ethyl Alcohol).

Conclusion: Carolina Seal, Inc. recommends two O-Ring materials for most Ethanol mixtures –

For **Normal Temperature** Applications, Carolina Seal's "4273B"TM material, a unique formulation of a Certified Dupont Viton® compound, is generally recommended as their standard (pedigree) material for Fuel Ethanol applications.

For **Low Temperature** Applications, (Below -15°F), their Certified Dupont Viton® "5355" compound, (A GF-LT family material), is offered.

For more information, call

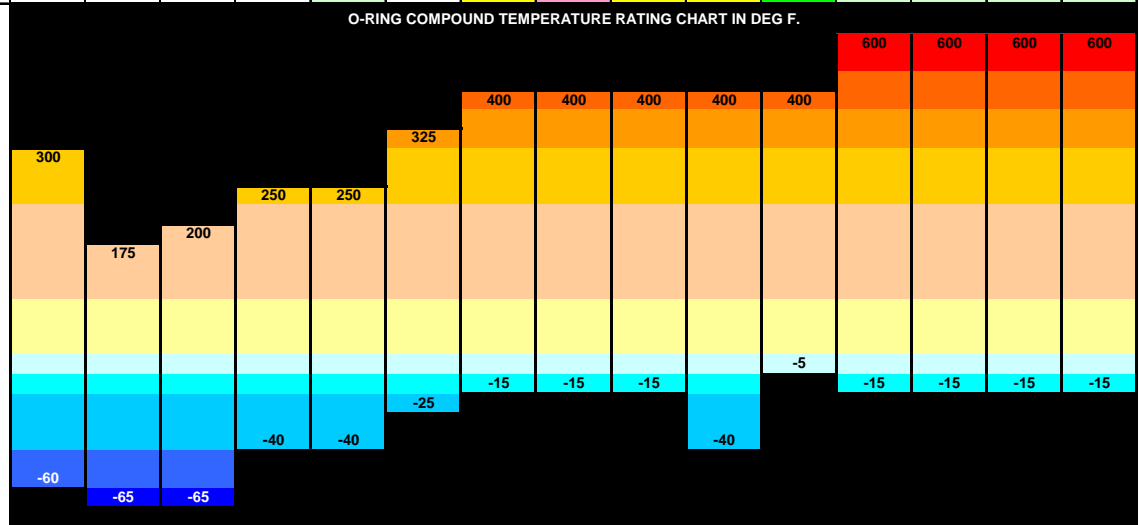
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FUEL ETHANOL AND DENATURANT COMPATIBILITY CHART

SEALING MATERIALS	Ethylene Prop. EPDM	Natural Rubber	Butyl IIR	Neoprene	Nitrile NBR	Nitrile, Hyd. HNBR	Viton® A	Viton® B+ Specific Formulation	Viton® GF-S	Viton® GFLT	Viton® Extreme ETP	Simriz®	Kalrez®	Kalrez®	Chemraz®
Carolina Seal Compound No.	EP-PC			NEOP	BUNA		4273A	4273B	5350	5355	5176	7295	K6375	K1050	C505
COMMODITY	Ethyl Alcohol	1	1	1	1	3	3	1	1	1	1	1	1	1	1
	E15-E85 (CE15-CE85) Fuels	4	4	4	4	3	3	2	1	1	1	1	1	1	1
	Hydrocarbons, General / Saturated	4	4	4	2	1	1	1	1	1	1	1	1	1	1
	Butane	4	4	4	1	1	1	1	1	1	1	1	1	1	1
	Pentane	4	4	4	1	1	1	1	1	1	1	1	1	1	1
	Hexane	4	4	4	2	1	1	1	1	1	1	1	1	1	1
	Heptane	4	4	4	2	1	1	1	1	1	1	1	1	1	1
	Propane	4	4	4	3	1	1	1	1	1	1	1	1	1	1
	Raffinate	4	-	-	4	2	-	1	1	1	1	1	1	1	1
	Naphtha	4	4	4	4	2	2	1	1	1	1	1	1	1	1
	Toluene	4	4	4	4	4	4	2	1	1	1	1	1	1	1
	ETBE 20, Ethyl Tertiary Butyl Ether, 20% in Gasoline	-	-	-	-	1	-	2	3	2	2	1	1	1	1

LEGEND	
1	= Best Fit / Recommended
1	= Little to No Effect
2	= Possible loss of Physical Properties
3	= Noticeable Change in Physical Properties
4	= Excessive Change – NOT Recommended



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 Kalrez® and Viton® are registered trademarks of DuPont Performance Elastomers.
 Chemraz® is a registered trademark of Green Tweed.
 *Generic FKM blends are NOT recommended

This guide is intended to assist the user in determining the suitability of various elastomers in different chemical environments. The ratings are based on a combination of published literature, laboratory tests, actual field experience, and informed judgments. As laboratory tests do not necessarily predict end use performance, users of these products should conduct their own evaluations to determine application suitability. NOTE: Volume swell is only one indicator of elastomer fluid compatibility and may be based on the solubility parameter alone. Fluid attack on the backbone of the polymer may show up as a change in physical properties such as Tensile Strength, Elongation at Break, and Hardness. Elevated temperatures and extended exposure times may create more aggressive conditions than cited in this guide. Contact CSI for technical assistance.

Per the AAR M-1002 Section C-part III, Appendix A, Paragraph 3.2;

"It is the shipper's responsibility to ensure that materials used for gaskets or valve seals are compatible with the lading and the service temperature."

