Hydrogenated Nitrile Sealing Compounds for Energy, Oil and Gas Service

Technical Bulletin

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HNBR Compounds provide cost-effective solutions in aggressive EOG environments

Description

Parker's HNBR compounds N1173-70, N1231-80 and KB163-90 are sealing compounds made from hydrogenated nitrile, a synthetic polymer that results from the hydrogenation of nitrile rubber (NBR).The hydrogenation process gives HNBR materials enhanced thermal stability (up to 149°C/300°F, with short periods at higher temperatures). HNBR materials also possess superior mechanical properties and enhanced fluid compatibility over standard nitrile compounds. These properties allow HNBR materials to be a cost effective bridging compound between nitrile and fluorocarbon elastomers.

Applications

Due to their enhanced abrasion resistance, Parker's HNBR elastomers are commonly used in journal bearing seals for drill bits. Their fluid and temperature resistance make N1173-70, N1231-80 and KB163-90 compounds ideal for any EOG applications where high temperatures and harsh chemicals, such as amines, are present.

HNBR is **recommended** for a wide range of chemicals including:

- Sour gas
- Water/glycol
- Petroleum oils
- Silicone greases
- Water/steam
- Most refrigerants including R134a
- Dilute acids and bases
- Aliphatic hydrocarbons
- Ozone

HNBR is **not recommended** for use in:

- Polar solvents
- Strong acids
- Fuels
- Chlorinated hydrocarbons
- Acetone
- Aldehydes

Key Features:

- **Improved high temperature resistance over Nitrile materials**
- **Enhanced wear and abrasion resistance over standard Nitrile materials**
- **Specific compounds are explosive decompression resistant**
- **Ozone resistant**
- **Improved chemical compatibility with several aggressive fluid medias**
- **Improved compression set resistance**

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Parker Seals

Parker's HNBR Compounds	N1173-70 platen	N1231-80 platen	KB163-90 platen	Comp A AS568A-214
Typical Physical Properties				
Hardness, Shore A, pts.	71	81	88	88
Tensile strength, psi	3048	3413	3219	2875
Elongation, %	180	297	107	98
Modulus at 50% elongation, psi	Not tested	Not tested	1552	1350
Compression Set				
70 hrs @ 150°C (302°F)				
% of original deflection	18.4	27.1	31.9	45.0
Fluid Immersion, ASTM Oil #1				
70 hrs @ 150°C (302°F)				
Hardness change, pts.	0	+3.0	+2.0	Not tested
Tensile change, %	+3.1	+3.8	+29.3	
Elongation change, %	+11.1	-7.1	No change	
Volume change, %	+3.0	-1.3	-1.5	
Fluid Immersion, IRM 903 Oil				
70 hrs @ 150°C (302°F)				
Hardness change, pts.	-7.0	Not tested	-7.0	Not tested
Tensile change, %	-22.6		+14.9	
Elongation change, %	-11.1		+2.8	
Volume change, %	+14.4		+8.2	
Fluid Immersion, IRM 903 Oil				
168 hrs @ 150°C (302°F)				
Hardness change, pts.	Not tested	Not tested	Not tested	-8.0
Tensile change, %				+12.1
Elongation change, %				+4.1
Volume change, %				+6.5
Heat Aging				
70 hrs @ 150°C (302°F)				
Hardness change, pts.	+3.0	+4.0	+3.0	Not tested
Tensile change, %	-4.0	-8.5	+21.6	
Elongation change, %	-18.0	-20.2	-14.0	

Unless otherwise noted, these are test values from a limited number of samples and should not be used for establishing specific limitations.

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