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Elastomer Compatibility of P-80® IFC Temporary Assembly Lubricants At Room Temperature

CONCLUSION: While there are no standard specifications for excessive swell and hardness data, minimal changes are regarded as between -5 to +20% and -5 to +10 points, respectively[1]. (Vecchio, 2001) Based on these criteria, P-80 IFC lubricants have acceptable swell and hardness compatibility results after 10 days. Mass compatibility results are favorable compared to the tap water control samples.

Customers are encouraged to conduct their own tests before using P-80 IFC lubricants.

ELASTOMER	PROPERTY	1 Day, %Δ			10 Days, %Δ		
		P-80 IFC EMULSION	P-80 THIX IFC	**Tap Water**	P-80 IFC EMULSION	P-80 THIX IFC	**Tap Water**
Buna N	%Δ Mass	+ 0.7	+ 0.3	+ 0.1	+ 2.8	+ 1.1	+ 0.2
	Δ Hardness, pts	**- 1.3**	**- 0.2**	**+ 1.2**	**- 3.2**	**- 2.5**	**+ 2.7**
	%Δ Swell	+ 0.4	+ 0.2	+ 0.1	- 0.5	+ 0.6	- 0.8
Butyl	%Δ Mass	+ 0.2	+ 0.1	0.0	+ 1.2	+ 0.3	+ 0.1
	Δ Hardness, pts	**+ 0.8**	**- 0.5**	**- 0.3**	**- 1.8**	**- 3.0**	**- 0.5**
	%Δ Swell	- 0.3	+ 0.1	+ 0.2	+ 0.8	- 0.3	- 0.2
ECH	%Δ Mass	+ 1.8	+ 1.5	+ 0.4	+ 4.6	+ 3.2	+ 1.4
	Δ Hardness, pts	**- 2.5**	**- 4.5**	**+ 4.7**	**- 6.5**	**- 6.3**	**+ 4.8**
	%Δ Swell	+ 0.2	0.0	+ 0.3	- 0.2	- 0.1	+ 0.8
EPDM	%Δ Mass	+ 0.3	+ 0.1	0.0	+ 1.3	+ 0.3	+ 0.1
	Δ Hardness, pts	**- 0.5**	**- 1.0**	**- 1.5**	**- 2.7**	**- 2.2**	**- 3.3**
	%Δ Swell	- 0.3	+ 0.1	- 0.8	+ 0.2	+ 0.3	- 0.8
Natural Gum Rubber	%Δ Mass	+ 0.5	+ 0.2	+ 0.1	+ 2.7	+ 0.8	+ 0.2
	Δ Hardness, pts	**+ 0.3**	**0.0**	**+ 1.3**	**- 1.3**	**- 2.2**	**- 0.7**
	%Δ Swell	-0.4	- 0.9	+ 0.0	+ 1.1	- 0.6	+ 0.1
Neoprene	%Δ Mass	+ 0.9	+ 0.5	+ 0.1	+ 3.6	+ 1.8	+ 0.5
	Δ Hardness, pts	**- 2.2**	**- 1.2**	**- 1.7**	**- 6.8**	**- 6.3**	**- 3.5**
	%Δ Swell	+ 0.5	+ 0.1	+ 0.1	+ 2.2	+ 0.8	- 0.1
SBR	%Δ Mass	+ 0.7	+ 0.2	+ 0.1	+ 2.9	+ 0.8	+ 0.2
	Δ Hardness, pts	**- 1.7**	**- 1.3**	**+ 4.0**	**- 7.5**	**- 4.3**	**+ 1.8**
	%Δ Swell	+ 0.7	+ 0.1	+ 0.1	+ 2.9	+ 0.8	+ 0.1
Silicone	%Δ Mass	+ 0.7	+ 0.5	0.0	+ 3.0	+1.0	0.0
	Δ Hardness, pts	**- 0.5**	**- 1.2**	**+ 0.7**	**+ 0.3**	**- 0.5**	**- 0.7**
	%Δ Swell	+ 0.6	- 0.3	+ 0.4	+ 0.7	+ 0.4	+ 0.6
Viton	%Δ Mass	+ 0.1	+ 0.1	0.0	+ 0.8	+ 0.4	+ 0.1
	Δ Hardness, pts	**- 0.7**	**+ 0.2**	**+ 1.3**	**- 1.5**	**- 1.7**	**- 0..5**
	%Δ Swell	- 0.7	- 0.5	- 0.1	+ 0.3	+ 1.3	+ 0.6

Repeatability Precision

Instrument	**Instrument Capability**	**Typical Average Measurements + Std. Dev**	**Coefficient of Variation**
Micrometer	0.001 mm	1.613 + 0.002	0.1%
Shore A Durometer	1 – 100 A Units	32.3 + 0.6	2.0%
Analytical Balance	0.0001 g	16.9482 + 6.7E-5	4.0E-6%

Modified version of ASTM D471

Coupons were soaked at room temperature for 10 days. Measurements were recorded at the specified time periods.

Vecchio, R.D. (2001). Physical Testing. In K. &. Baranwal, *Basic Elastomer Technology* (pp. 218-219). Baltimore: Rubber Division, American Chemical Society.