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Elastomer Compatibility of 2% ENZYME CLEANERS 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, respectively¹. (Vecchio, 2001) Based on these criteria, a 2% solution of each of our enzyme cleaners has acceptable swell and hardness compatibility results after 1 day. After 10 days, some elastomers softened more than 5 points. Mass compatibility results are favorable compared to the tap water control samples.

Customers are encouraged to conduct their own tests before using our enzyme cleaners.

ELASTOMER	PROPERTY	1 Day, %Δ			10 Days, %Δ		
		ZYMIT PRO®	ZYMIT® LOW-FOAM	Tap Water	ZYMIT PRO®	ZYMIT® LOW-FOAM	Tap Water
Buna N	%Δ Mass	+0.1	+0.1	+0.1	+0.3	+0.2	+0.2
	Δ Hardness, pts	-0.5	-2.0	+1.2	-1.7	-2.2	+2.7
	%Δ Swell	+0.5	+0.1	+0.1	+0.4	-0.2	-0.8
Butyl	%Δ Mass	0.0	0.0	0.0	+0.2	+0.2	+0.1
	Δ Hardness, pts	+0.8	-2.0	-0.3	0.0	-2.5	-0.5
	%Δ Swell	+0.3	0.0	+0.2	+0.2	-0.7	-0.2
ECH	%Δ Mass	+0.9	+0.1	+0.4	+1.6	+0.8	+1.4
	Δ Hardness, pts	-0.2	-3.2	+4.7	-2.6	-2.0	+4.8
	%Δ Swell	+0.6	+0.4	+0.3	+0.6	+0.1	+0.8
EPDM	%Δ Mass	+0.1	0.0	0.0	+0.1	+0.1	+0.1
	Δ Hardness, pts	+0.5	-1.0	-1.5	+0.2	-1.2	-3.3
	%Δ Swell	+0.2	+0.2	-0.8	+0.1	-0.2	-0.8
Natural Gum Rubber	%Δ Mass	+0.1	+0.1	+0.1	+0.4	+0.8	+0.2
	Δ Hardness, pts	-2.3	-1.7	+1.3	-5.4	-0.5	-0.7
	%Δ Swell	0.0	+1.0	+0.0	-0.4	+0.8	+0.1
Neoprene	%Δ Mass	+0.2	+0.2	+0.1	+0.8	+0.8	+0.5
	Δ Hardness, pts	-0.5	-2.0	-1.7	-3.0	-3.7	-3.5
	%Δ Swell	-0.1	+0.2	+0.1	+0.1	-0.2	-0.1
SBR	%Δ Mass	+0.2	+0.1	+0.1	+0.4	+0.3	+0.2
	Δ Hardness, pts	-0.3	0.0	+4.0	-4.0	-1.8	+1.8
	%Δ Swell	+0.1	+0.2	+0.1	+0.1	+0.1	+0.1
Silicone	%Δ Mass	+0.1	0.0	0.0	+0.2	+0.1	0.0
	Δ Hardness, pts	0.0	-0.5	+0.7	+3.1	+0.8	-0.7
	%Δ Swell	-0.1	+0.1	+0.4	-0.4	+0.1	+0.6
Viton	%Δ Mass	+0.1	0.0	0.0	+0.2	+0.3	+0.1
	Δ Hardness, pts	-0.5	-0.5	+1.3	-1.1	-1.2	-0.5
	%Δ Swell	-0.4	-0.3	-0.1	-0.2	-0.5	+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.