

HIFILL[®] N

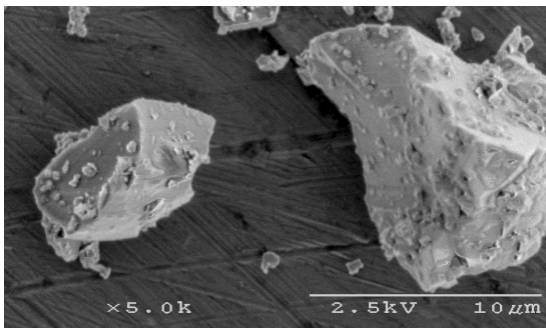
Nepheline Syenite Filler

HIFILL[®] N uniquely combines superior performance in Silicone Elastomers and compliance with OSHA's Respiratory Crystalline Silica (RCS) regulations

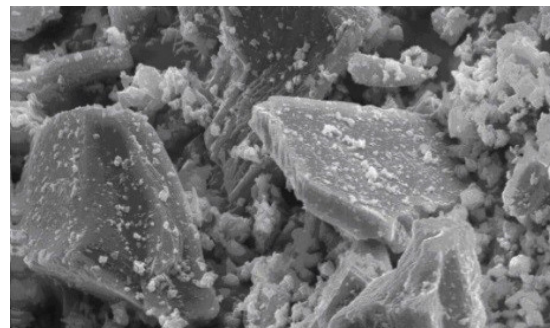
COVIA's HIFILL N (nepheline syenite) is the crystalline silica-free alternative to ground or microcrystalline silica mineral fillers typically used in silicone elastomeric applications.

Formulators have been adopting low crystalline silica HIFILL N due to stricter OSHA regulations on RCS, and due to Hifill N's similar high dielectric resistance, thermal conductivity, compressive strength and UV resistance properties.

This independent study shows how HIFILL N delivers superior performance relative to Min-U-Sil[®] (ground silica) in silicone elastomer applications, which is yet another reason why formulators have been adopting it.



SEM Photomicrograph-Min-U-Sil 30



SEM Photomicrograph-HIFILL N 800

For more information about HIFILL N mineral fillers,
please call: 800.243.9004 or email: Sales@CoviaCorp.com.



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Morphology

Min-U-Sil morphology is angular. HIFILL N is a silica-deficient sodium-potassium alumino-silicate with an angular morphology similar to crystalline silica and microcrystalline silica. Reinforcement, tensile and elongation are similar for grades with similar particle size distribution based on similar particle shape characteristics.

Oil absorption

Min-U-Sil and HIFILL N are low oil absorption and low viscosity. Oil absorption is typically in the 20-35% range for both and this allows for higher loading and similar rheology.

Hardness

Min-U-Sil (GCS) is Mohs hardness 7 and HIFILL N (NS) is 6.0 to 6.5 on a scale from 1-10. When highly filled with either Min-U-Sil or HIFILL N, silicone rubber and elastomers will have similar hardness and NS is less abrasive to extruders than GCS for longer equipment life and less maintenance.

GE brightness

Min-U-Sil brightness values range from of 82-87. HIFILL N offers dry brightness values in the 85-93 range and less yellowness overtones. It will enhance the colors more effectively than crystalline silica in all white and pigmented or tinted applications.

pH

Min-U-Sil and HIFILL N both have excellent chemical resistance. pH of GCS in 6.5 while HIFILL N is typically in 9-10 range. Curing behaviors are similar.

Particle size and property offset chart

Grade	*mean, μm	+325 mesh	pH	GEB	% Oil Absorption
Min-U-Sil 40	9.0	2.2	6.5	83	29
HIFILL N 1000	10.8	1.5	9.9	87	24
Min-U-Sil 30	5.5	0.1	6.5	88	29
HIFILL N 800	6.8	0.1	10.1	88	26
Min-U-Sil 15	3.0	trace	6.5	88	39
HIFILL N 400	3.6	0	10.1	89	31
Min-U-Sil 10	2.0	0	6.5	91	39
HIFILL N 300	2.1	0	10.2	91	33
Min-U-Sil 5	1.0	0	6.5	88	40
HIFILL N 200	1.5	0.0	10	90+	35

*Sedigraph mean P.S. in microns

The technical data presented here is for marketing purposes only and is not contractually binding, the data herein is determined using Covia standard test methods. Since the product is based upon a naturally occurring material, we reserve the right to change this data when necessary. Safety information accompanying this product is available in the form of an SDS. All sales are undertaken strictly in accordance with our "General Conditions of Sale", available upon request, or by written sales agreement duly signed by Covia.



Comparison of physical properties in 60 durometer hardness silicone elastomer sheet molding compound

HIFILL N 400 VS Min-U-Sil 15 IN ACCORDANCE WITH THE AA 59588B.

60 Durometer sheet molding compound test formula

Ingredient parts	Base
60 Durometer silicone base	100.0
DBPH-50 molding catalyst	1.0
Extender	50.0

HIFILL N 400 outperforms Min-U-Sil 15 in several key physical tests and is the suitable and proven safer alternative to ground crystalline silica. The superior elongation performance of compounds formulated with HIFILL N 400 allow for higher loadings leading to cost savings while meeting the specification.

Specification	A-A-59588B	Min-U-Sil 15	HIFILL N 400	
ASTM method	Test	(60 CG lot 16258)	(60 CG lot 16260)	Limits
	Appearance	pass	pass	pass/fail
D792	S.G. (g/cc)	1.427	1.429	report
2240	Durometer (Shore A)	51-fail	56	55 to 65
D412	Tensile (PSI)	801	850	650 min
D412	Elongation (%)	343	294	100 min
D412	Modulus 100%	342	394	report
D624	Tear strength, PPI DIE B	93	90	report
D395 meth B 70 hours @150C	Compression set (%)	11.70	13.8	25 max
D573 70 hours @225C	Dry heat resistance <i>change in hardness points</i> <i>change in tensile (%)</i> <i>change in elongation (%)</i>	+6.4 +3.1 -40.9 fail	+2.7 +1.2 -26.5	+10 max -20 max -40 max
D2137 @62.2C	Low temp resistance <i>brittleness</i>	pass	pass	pass/fail
D471 70 hours @100C	Water immersion <i>volume change</i>	-0.75	-0.41	+5 max

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