

UCC 014953

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CALIDRIA RESIN-GRADE ASBESTOS FOR VINYL PLASTISOL SEALANT APPLICATIONS

GENERAL

CALIDRIA Asbestos Resin-Grade products, R-G 144 and R-G 244 are effective, economic viscosity control agents for vinyl plastisol sealants.

- R-G 144 is an economical highly purified fiber product which is grit-free and non-abrasive.
- R-G 244, a modified fiber, was developed for maximum thixotropy in various resin systems.

TYPICAL PHYSICAL PROPERTIES

Property	*CALIDRIA* ASBESTOS	
	R-G 144	R-G 244
Specific Gravity	2.45	2.45
Moisture Content, % by wt.	2.0, max.	2.0, max.
Surface Area, sq. meters per gram	60, appr.	60, appr.
Reflectance, G. E. Brightness	72-76	80-84
Nature of Surface Charge in Water Slurry	Cationic	Neutral
Oil Absorption (DOP), lb. per 100 lb.	120-140	300-350
Refractive Index, n_D 25°C.	1.54-1.56	1.54-1.56
Dry Bulk Density (Aerated), lb./cu. ft.	4	1
Packaged Bulk Density, lb./cu. ft.	17	5
Standard Package Weight, lb.	35	10
% Magnetite, maximum	0.6	0.3
Fiber Diameter, microns	0.025	0.025
Length/Diameter	200, avg. (1000, max.)	200, avg. (1000, max.)

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SEALANT EVALUATION

CALIDRIA R-G 144 and R-G 244 provide excellent anti-sag resistance in both low (approx. 275-375°F.) and high (greater than 350°F.) fusion temperature plastisol sealants. Since CALIDRIA R-G products do not detract from inherent plastisol adhesion, formulations shown provide excellent adhesion as well as desired viscosity control. Typical formulations together with performance data on each are shown in the following tables:

TABLE 1

HIGH FUSION TEMPERATURE STRUCTURAL SEALANT (with CALIDRIA R-G 244)

Formulation	Parts by Weight
BAKELITE QYOH-2 Resin	100
FLEXOL Plasticizer 10-10	60
FLEXOL Plasticizer 10A	40
EX-1 Extender Plasticizer	10
Barium-Cadmium Stabilizer	2
UNION CARBIDE Silane Y-5162 Adhesion Promoter	0.25
Calcium Carbonate	130
CALIDRIA R-G 244 Asbestos	5
Test Data	
Butt tensile adhesion to cold-rolled steel after 45 minutes cure at 350°F.	440 psi.
Severs Type Flow Properties Binks orifice (1/8 inch) Time of test, 150 seconds	Grams at 40 psi., Aged 24 hr. at Room Temperature . . . 63 72 hr. at 130°F. . . . . 76 45 days at Room Temperature . . 73
Shore Hardness, A scale after 24 hr. at Room Temperature	76

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TABLE 2
HIGH FUSION TEMPERATURE STRUCTURAL SEALANT
(with CALIDRIA R-G 144)

Formulation	Parts by Weight
BAKELITE QYOH-2 Resin	90
BAKELITE QYPM Resin	10
FLEXOL Plasticizer 10-10	60
FLEXOL Plasticizer 10-A	40
EX-1 Plasticizer Extender	10
"Duramite" Filler[a]	120
"Mark" LL Stabilizer[b]	2
UNION CARBIDE Y-5162 Silane Adhesion Promoter	0.5
CALIDRIA R-G 144 Asbestos	10

[a] Thompson, Weinman & Co.
[b] Argus Chemical Co.

Test Data		
Bead seal on cold-roll steel after aging 24 hours, cured 15 minutes at 350°F.	Excellent Adhesion	Cohesive Failure
Bead seal on cold-roll steel adhesion after aging 43 days at room temperature plus 3 days at 130°F., cured 15 minutes at 350°F.	Excellent Adhesion	Cohesive Failure
Severs Type Flow Properties Binks orifice (1/8 inch) Time of test, 150 seconds	Grams at 40 psi., Aged 24 hr. at Room Temperature . . . 21 72 hr. at 130°F. 21	
Shore Hardness, A Scale after 24 hr. at Room Temperature 86		

In Table 3, a typical appliance-type sealant is shown. This formula is similar to the structural sealant outlined in Table 2. The appliance compound does not require the high strength of the structural sealant; however, sag resistance over a wide temperature range and excellent adhesion are extremely important in the appliance-type system. The added filler content of the appliance compound creates an added viscosity problem that is easily adjusted by the addition of more BAKELITE QYPM Plastisol Blending Resin. Table 3, also lists some performance characteristics of the appliance sealant. In addition to those properties shown in Table 3, the appliance type sealant has passed two mandrel

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bend tests. A 1/4-inch high by 3/8-inch wide bead seal was drawn down on a "Bonderite" 1000 steel panel. The bead was baked 45 minutes at 350°F. After a 24-hour room temperature aging, the panel was bent around a 1-inch mandrel. A knife cut was made through the bead at the point of highest stress. After seven days, the sealant had not pulled loose from the panel. The same sealant bead size panel type and bake cycle were used to bend over a 3-inch mandrel after the panel had been aged one hour at -20°F. No cut was made in this test. After the -20°F. bend was made, no pulling away or cracking of the sealant was evident.

TABLE 3
APPLIANCE SEALANT

Formulation	Parts by Weight
BAKELITE QYOH-2 Resin	75
BAKELITE QYPM Resin	25
FLEXOL Plasticizer 10-10	110
"Duramite" Filler[a]	200
"Mark" LL Stabilizer[b]	2
UNION CARBIDE Y-5162 Silane Adhesion Promoter	0.5
CALIDRIA R-G 144 Asbestos	2

[a] Thompson, Weinman & Co.
[b] Argus Chemical Co.

Test Data	*Adhesion*	*Type of Failure*	*Degree of Sag*
3/16-inch bead seal on cold-roll steel, cured 10 minutes at 350°F.	Excellent	Cohesive	None
1/2-inch rectangular bead seal, baked vertically at:[c]			
270°F. for 20 minutes	Poor	Adhesive	None
350°F. for 45 minutes	Excellent	Cohesive	None
400°F. for 30 minutes	Excellent	Cohesive	None
Severs Type Flow Properties			
Binks orifice (0.051 thousandth) Time of test, 30 seconds	Aged 24 hr. at Room Temperature		
	Grams at 20 psi.	2.5	
	Grams at 40 psi.	7.0	
	Grams at 60 psi.	12.6	

[c] Adhesion and sag tests run on cold roll. "Bonderite" 100 and "Bonderite" 1000.

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Table 4 includes a typical formulation for a low fusion temperature plastisol sealant containing CALIDRIA R-G 144. This formulation, which exhibits excellent sag resistance, can be used in automotive drip rail sealer applications or in other areas where waterproofing and adhesion are required.

TABLE 4
LOW FUSION TEMPERATURE PLASTISOL SEALANT

Formulation	Parts by Weight
BAKELITE VLFV Resin	90
BAKELITE QYPM Resin	10
FLEXOL Plasticizer 10-10	60
FLEXOL Plasticizer 13-13	10
FLEXOL Plasticizer Z-88	40
EX-1 Extender Plasticizer	15
"Mark" LL[a] Stabilizer	2
"Duramite" Filler [b]	120
UNION CARBIDE Y-5162 Silane Adhesion promoter	0.5
CALIDRIA R-G 144 Asbestos	10

[a] Argus Chemical
[b] Thompson, Weinman & Co.

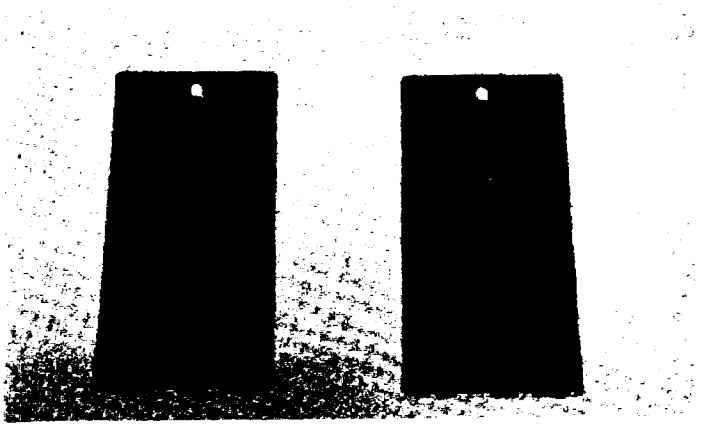
Test Data		
Severs Type Flow Properties Binks orifice (1/8 inch) Time of test, 150 seconds	Grams at 40 psi., Aged 24 hr. at room Temperature . . . 275 3 days at 130°F. 110	
Bead seal on cold-rolled steel, 20 minutes at 300°F.	Excellent Adhesion	Cohesive Failure

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FIGURE 1 – ILLUSTRATION OF SAG RESISTANCE



COLD ROLL STEEL
FUSED - 15 MINUTES
AT 350°F.

COLD ROLL STEEL
FUSED - 20 MINUTES
AT 350°F.

Figure 1 shows sag resistance and, although it is difficult to see, the coating of sealant left on the panel after attempts to remove the bead with a razor blade. In both the high fusion temperature plastisol sealant shown in Table 1 and the low fusion temperature system in Table 4, the adhesion failures are cohesive.

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Calidria ASBESTOS

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