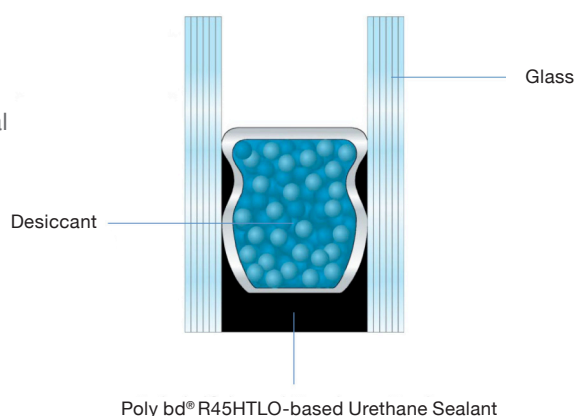


Poly bd[®] R45HTLO Polybutadiene Polyols in Sealant Applications



Benefits

- Excellent water resistance and gas retention
- Adhesion to metal and glass substrates
- Formulated sealants possess excellent mechanical properties over a wide temperature range



Description

Polybutadiene Polyols are used worldwide as preferred materials in marine, automotive, building construction and insulating glass window sealing applications.

Insulating glass sealants (IGS) must meet the highest standards of performance. Isocyanate-cured Poly bd[®] R45HTLO-based urethane formulations are capable of providing excellence in adhesion, barrier, and physical properties over a wide temperature range.

IGS formulations based on polybutadiene polyols deliver a unique balance of properties based on the diene backbone of the resin. Low-vinyl microstructure delivers a low T_g resulting in superior low-temperature flexibility. The hydrocarbon-based polyol is inherently hydrophobic, and can be formulated to very low water moisture vapor transmission rates (MVTR). The barrier properties are also high, resulting in good gas retention. Urethane-based sealants can provide adhesion to a wide spectrum of substrates. Poly bd R45HTLO-based sealants also accept high loadings of fillers, expanding formulating flexibility.

Cray Valley Hydrocarbon Specialty Chemicals has recently completed a 40 percent capacity expansion in Poly bd production in its U.S. manufacturing site, increasing polyol supply and reinforcing our commitment to the sealant market.

TECHNICAL UPDATE

Poly bd® R45HTLO Polybutadiene Polyols in Sealant Applications



A comparison of Poly bd R45HTLO-based urethane and Polysulfide sealant formulations is provided below.*

<i>Test</i>	<i>Poly bd R45HTLO-based Formulation</i>		<i>Polysulfide Formulation</i>	
Days in Weatherometer	0	30	0	30
Tensile, psi	237.0	288.0	164.0	160.0
Elongation, %	383.0	476.0	431.0	95.0
Tensile Set, %	6.0	9.0	32.0	2.0
Hardness, Shore A	43.0	39.0	50.0	61.0
100% Modulus, psi	131.0	111.0	119.0	-
T-Peel, Glass, pli	38.3	39.2	8.0	10.3
MVTR, Metric Perms	0.2	-	0.3	-

*Formulation provided in Appendix, NCO/OH = 0.95; Weatherometer utilizes 6500 watt xenon arc, borosilicate glass filtered, with a cycle of 102 minutes dry, 18 minutes water spray at 50% relative humidity and a black body temperature of 140 °F.

Outside IGS applications, advantages of Poly bd R45HTLO-based sealants can be leveraged in automotive and other performance-critical markets. Poly bd R45HTLO-based sealants can be formulated to provide a variable cure profile, based on the application needs. Typical processing times range from 20-45 minutes, with tack-free times on the order of 4-8 hours.

Conclusion

Taken together, the advantages of formulating IGS based on Poly bd R45HTLO resin can result in high performance and longer warranties. Urethane sealants incorporating Poly bd resin can provide performance and price benefits over polysulfide or silicone alternatives.

<i>Property</i>	<i>Poly bd R45HTLO-based Polyurethane</i>	<i>Polysulfide</i>	<i>Silicone</i>
MVTR	Excellent	Good	Poor
Low-Temperature Flexibility	Excellent	Good	Excellent
Gas Retention	Excellent	Excellent	Poor
Mechanical	Good	Good	Good
UV Stability	Good	Good	Excellent
Cost	Medium	Medium	High

TECHNICAL UPDATE

Poly bd® R45HTLO Polybutadiene Polyols in Sealant Applications



Appendix

<i>Ingredient</i>	<i>Parts by Weight</i>
Poly bd R45HTLO (OH value - 0.85 meq/g)	100
2-Ethyl-1,3-hexanediol	2.11
Calcium Carbonate	125
Carbon Black	2
Benzyl Phthalate Plasticizer	75
Fumed Silica	7.5
Antioxidant	2
Silane	2
Dibutyltin Dilaurate	0.045
Isocyanate	15.49

* The listed properties are illustrative only, and not product specifications. Cray Valley disclaims any liability in connection with the use of the information, and does not warrant against infringement by reason of the use of its products in connection with other materials or in any process.