Bayer MaterialScience

Product Information

BAYFLEX® 110-50

Elastomeric Polyurethane RIM System

Description

The Bayflex 110-50 system produces a solid urethane elastomer which has a flexural modulus of approximately 50,000 psi* at room temperature. This system can be used with or without milled glass fiber or mineral reinforcements. The Bayflex 110-50 system is used in applications requiring excellent impact properties such as automotive fascias, agricultural and construction equipment, specialty vehicles and recreational equipment.

The Bayflex 110-50 system is a formulated elastomeric reaction injection molding (RIM) system supplied as two liquid components. Component A is a diphenylmethane diisocyanate (MDI) prepolymer, and Component B is a polyether polyol system. As with any product, use of the Bayflex 110-50 system in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

Typical Properties of the System*

Property[a]	ASTM Test Method (Other)	Unit	Unfilled	15% Glass	25% Glass[b]	15% Mineral[c]	24% Mineral[d]
General							
Specific Gravity	D 792		1.04	1.14	1.19	1.15	1.19
Density	D 1622	lb/ft^3	64.9	71.2	75	71.8	74.2
Thickness		in	0.125	0.125	0.125	0.125	0.150
Shore Hardness	D 2240	Shore Scale	58D	60D	64D	60D	64D
Mold Shrinkage	(Bayer)	%	1.3	0.7	0.47	0.6	0.34
Water Immersion, Length Increase	(Bayer)	in/in	0.006	0.002			
Water Absorption, 240 Hours	(Bayer)	%	2.8	2.6			
Mechanical							
Tensile Strength, Ultimate	D 412	lb/in^2	3,500	2,800	2,900	3,300	2,700
Elongation at Break	D 412	%	250	200	95	140	96
Flexural Modulus	D 790	lb/in^2					
65°C (149°F)			38,000	60,000	80,000	111,000	94,000
23°C (73°F)			52,000	100,000	135,000	125,000	155,000
-30°C (-22°F)			115,000	160,000	200,000	250,000	330,000
Tear Strength, Die C	D 624	lbf/in	450	620	550	640	665
Notched Izod Impact Strength	D 256	ft·lb/in	11	8	4.8	3	4.5
Thermal							
Heat Sag:	D 3769						
4-in Overhang, 1 hr @ 250°F		in	0.60	0.28	0.28		0.26
6-in Overhang, 1 hr @ 250°F		in	0.36	0.27	0.5	0.16	
Coefficient of Linear Expansion	D 696	in/in/°F	< 42 E-06	44 E-06	40 E-0	27 E-06	28 E-06
Flammability[e]							
UL94 Flame Class:	(UL94)						
0.125-in (3.18-mm) Thickness		Rating	HB				

* *These items are provided as general information only. They are approximate values and are not part of the product specifications.*

[a] *Properties are for materials postcured at 121°C for one hour. All directional properties are for parallel direction only.*

[b] *Milled glass fiber, OCF 737, 1/16 inch.*

[c] *RRIMGLOS 10013 (RRIMGLOS is a trademark of NYCO Minerals, Inc.*

[d] *Calcium silicate*

[e] *Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or an other material under actual fire conditions.*

Typical Properties* of Components

Property	Isocyanate (Component A)	Polyol (Component B)
Appearance	Light yellow to yellow liquid	Dark amber viscous liquid
Specific Gravity at 25°C	1.21	1.03
Viscosity at 25°C, mPa•s	700	1,300
Flash Point, PMCC, °C	213	174

Processing Conditions

Molding Parameters*	
Material Temperature,°C (°F), Unfilled	32 - 38 (90 - 100)
Mold Temperature,°C (°F)	60 - 70 (140 - 158)
Typical Cure Time (0.125-in thickness), sec.	30
Polyol Nucleation:Specific Gravity, Unfilled	0.70 - 0.75
Mixing Ratio (by weight), A/B, 105 Index	58/100

Storage and Handling

Isocyanate Component - Component A (MDI prepolymer) must be stored in tightly closed containers and protected from contamination with moisture and other foreign substances, which can adversely affect processing. It will react slowly with water to form ureas and carbon dioxide gas, which may cause sealed containers to expand and rupture. Partially filled containers should be blanketed with dry nitrogen.

Storage temperatures should be maintained between 24° and 30°C (75° and 86°F). Under these conditions, Component A will remain clear for periods of up to six months. Within this range, lower storage temperatures will maximize the storage life of the product.

Component A must not be allowed to freeze. Exposure to temperatures less than 15°C (59°F), even for short periods of time, can result in the formation of solid material. During the winter months, appropriate precautions must be taken during shipment and storage.

Prolonged storage of solid or partially solid Component A may result in the formation of MDI dimer in amounts which exceed its solubility in the prepolymer at normal storage temperatures. This can make the product unusable.

If solids should form because of exposure of Component A to lower temperatures, it may be possible to reliquify the prepolymer by reheating. Use a well-ventilated oven for the minimum time necessary to render it clear. The temperature of the prepolymer should not exceed 60°C (140°F). Agitation or drum rollers are recommended to avoid excessive local heating, which will degrade the prepolymer.

Significant amounts of MDI dimer may form during the heating process. As a result, the remelted prepolymer may be cloudy, and the processing behavior and properties of the final product may be affected.

Polyol Component - Component B (polyether polyol system) is slightly hygroscopic and may absorb water. Containers should be kept in tightly closed and protected from contamination with moisture and foreign materials which can adversely affect processing. For ease of handling, storage temperatures between 16° and 43°C (60°and 110°F).

Health And Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling Bayflex 110-50 system components. Before working with these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g.,material safety data sheets and product labels. Consult your local Bayer MaterialScience representative or contact Bayer's Product Safety and Regulatory Affairs Department in Pittsburgh, PA.

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This product is not designated as “Medical Grade” and therefore shall not be considered a candidate for the manufacture of a medical device or of intermediate products for medical devices, which are intended under normal use to be brought into direct contact with the patient’s body (e.g., skin, body fluids or tissues, including indirect contact to blood)*. If the intended use of the product is for the manufacture of a medical device or of intermediate products for medical devices, Bayer MaterialScience LLC must be contacted in advance to provide its agreement to sell such product for such purpose. Nonetheless, any determination as to whether a product is appropriate for use in a medical device or intermediate products for medical devices must be made solely by the purchaser of the product without relying upon any representations by Bayer MaterialScience LLC. For further information, please contact bmsmedicalapplication@bayer.com.

*Please see the “Guidance on Use of Bayer MaterialScience Products in a Medical Application” document which can be located at baycareonline.com.

Note: The information contained in this bulletin is current as of May 2012, please contact Bayer MaterialScience to determine whether this publication has been revised.

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