



Formulated Systems

# PRODUCT INFORMATION

## PROVISIONAL TECHNICAL DATASHEET

3/31/2011

### **Introduction**

HYPERLAST™ 101 is a polyether based prepolymer intended for reaction with the HYPERLAST C101 range of curatives to give high performance polyurethane elastomers in the hardness range 60 - 95 Shore A. HYPERLAST 101 Prepolymer can be reacted with HYPERLAST C101/60 Polyol curative to produce an elastomer at 60 Shore A and with increasing quantities of DIPRANE™ C chain extender as a three component system to produce elastomers of up to 95 Shore A hardness. These polyurethane elastomers exhibit excellent properties including good tensile strength, excellent resilience and low temperature flexibility as well as outstanding hydrolytic stability.

The HYPERLAST 101 series gives specific processing advantages over more traditional high performance polyurethane casting systems. These include

- Low ratio mixing
- Low viscosity at processing temperature
- Low temperature processing and curing
- Polyol based curatives giving lower toxic hazard than many diamine cured systems.

### **Applications**

HYPERLAST 101 systems may be processed in the temperature range 30 – 50 °C. At this temperature the viscosity of the mixed system is extremely low, making it suitable for open casting and compression moulding. Typical uses for HYPERLAST™ 101 based elastomers include:

- Slurry pump impellers
- Chute and hopper linings
- Seals and gaskets
- Wheels and rollers
- Pipe lining

## **HYPERLAST 101 SERIES THREE COMPONENT HIGH PERFORMANCE POLYURETHANE ELASTOMER SYSTEM**

## **Component Properties**

### **Polyol Component**

Product Reference	HYPERLAST™ C101/60 Polyol
Appearance	White Solid at 25 °C
Viscosity	200 – 300 cps at 40 °C
Specific Gravity	0.97 – 0.99 at 40 °C

### **Isocyanate Component**

Product Reference	HYPERLAST 101 Prepolymer
Appearance	Pale Straw Liquid at 25°C
Isocyanate Content	16.35 - 16.75 %
Viscosity	500 - 1000 cps at 40 °C
Specific Gravity	1.10 – 1.14 at 40 °C

### **Chain Extender Component**

Product Reference	DIPRANE™ C
Appearance	Whitish, Crystalline Solid below 20°C
Appearance	Colourless, Clear Liquid above 20°C
Viscosity	90 – 100 cps at 25°C
Specific Gravity	1.01 - 1.02 at 20°C

## **Mixing Ratios**

HYPERLAST curatives can be blended in the following proportions to give a range of hardness from 60°A to 95°A.

<b>Hardness (Shore A)</b>	<b>60</b>	<b>65</b>	<b>70</b>	<b>75</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>95</b>
HYPERLAST C101/60 Polyol	150	135.3	116.1	102.6	87.9	73.2	57.4	44.9
DIPRANE C	-	1.7	3.9	5.4	7.1	8.8	10.6	12.1
HYPERLAST 101 Prepolymer	100	100	100	100	100	100	100	100

NB: The above ratios are in parts by weight and should be measured to an accuracy of  $\pm 1\%$ .

HYPERLAST C101 curatives can be supplied ready blended in the above hardness grades for use as two component systems. They should be thoroughly mixed before use as separation will occur on standing.

## **Cured System – Typical Properties**

<b>Hardness (Shore A)</b>	<b>60</b>	<b>65</b>	<b>70</b>	<b>75</b>	<b>80</b>	<b>85</b>	<b>90</b>	<b>95</b>
Tensile Strength (MN/m <sup>2</sup> )	14.5	20	22	28	30	34	34	30
100% Modulus (MN/m <sup>2</sup> )	1.8	2.0	2.6	3.4	4.4	6.2	9.0	10.3
300% Modulus (MN/m <sup>2</sup> )	3.6	4.3	6.3	8.0	9.5	14	16	17
Elongation at Break (%)	470	470	470	450	450	450	450	450
Tear Strength (KN/m)	26	30	38	44	60	80	95	105
Resilience (%)	72	67	65	63	57	50	51	47
DIN Abrasion (mm <sup>3</sup> loss)	85	75	60	50	45	45	45	45
Compression Set - 25% (22Hr/70°C)	35	35	25	27	20	40	26	33

## **Processing Details**

The following information is given as a general guide to processing HYPERLAST™ 101 systems. As mouldings and mould materials may be of very different types, sizes etc it is recommended that exact moulding conditions for a particular application are determined practically. Our Technical Service Department can offer more detailed advice.

### **Processing Temperature**

The HYPERLAST 101 series may be processed at temperatures between 30 – 50 °C.

### **Machine Mixing**

Our Technical Service Department can advise on suitable two or three component dispensing equipment for processing HYPERLAST 101 series elastomers.

### **Hand Mixing**

- 1) Pre-heat the HYPERLAST C101/60 curative to 40 – 50 °C, and the DIPRANE™ C to 20 – 30 °C. HYPERLAST 101 Prepolymer may be used at ambient temperature to avoid any vapour hazard.
- 2) HYPERLAST C101/60 curative should be mixed by rolling the drum before use.
- 3) Accurately weigh the required quantities of HYPERLAST C101/60 and DIPRANE C curative into the mixing vessel and mix together.
- 4) Weigh the required amount of HYPERLAST™ 101 Prepolymer into the vessel and mix together thoroughly for approximately one minute.
- 5) Place the mixed components in a vacuum chamber and thoroughly de-gas for up to two minutes at 5 torr (minimum).
- 6) Cast the reacting mixture into moulds which have been pre-heated to 60 – 80 °C and treated with mould release agent.

### **Mould Dwell**

Depending on the starting temperatures, the quantities mixed and the mould configuration, mixed HYPERLAST 101 systems should give a working life of 5 - 8 minutes. The castings should then be capable of demoulding within 20 - 30 minutes.

### **Post Cure**

To ensure rapid attainment of physical properties, the demoulded article should be post cured at 80 °C for 16 - 24 hours in an evenly heated oven.

## **Storage and Handling**

		<b>Shelf life</b>
Polyol Component	HYPERLAST™ C101 curatives are sensitive to atmospheric moisture and drums should be used in such a way as to minimise contact with air. Part used drums should ideally be purged with dry nitrogen before re-sealing. When stored in sealed containers at a temperature below 30 °C, HYPERLAST C101 curatives have a minimum shelf life of 12 months. HYPERLAST C101 curatives are mixtures which will slowly separate upon standing and may begin to crystallise below 30 °C. If the material has been allowed to crystallise it can be melted out by leaving for 12 - 24 hours at 40 °C. The material should be drum rolled to ensure good mixing prior to use.	12 months
Isocyanate Component	HYPERLAST 101 Prepolymer is sensitive to atmospheric moisture and drums should be used in such a way as to minimise contact with air. Part used drums should be purged with dry nitrogen before resealing. HYPERLAST 101 should be stored at approximately 15 - 30 °C. Storage at elevated temperatures should be kept to the minimum possible for processing. Storage at temperatures below 5 °C may lead to partial crystallisation of the isocyanate. This can be remelted by heating the sealed containers at 60 - 70 °C in a well ventilated oven. Under ambient conditions the material has a shelf life of six months. HYPERLAST 101 is an isocyanate prepolymer and should be handled in accordance with our recommendations laid down in the information sheet "ISOCYANATES - HAZARDS AND SAFE HANDLING PROCEDURES".	6 months
Chain Extender Component	Store in tightly sealed containers at a temperature of 15 – 30 °C. Raise to the processing temperature and mix well before use. Avoid contact with moisture.	12 months

## **Packaging**

Polyol Component	25 Kgs, 200 Kgs
Isocyanate Component	25 Kgs, 200 Kgs
Chain Extender Component	25 Kgs, 205 Kgs, 1000 Kgs

## **Safety Considerations**

Customer should refer to the Dow product Material Safety Data Sheet (MSDS) to understand the hazards of the product and safe handling guidance.

## **Customer Notice**

Dow encourages its customers to review their applications of Dow products from the standpoint of human health and environmental quality. For further information about safety considerations for your product/application, please contact your Dow Sales representative.

**Contact Information:**

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