PRODUCT INFORMATION

TECHNICAL DATASHEET
3/29/2017

Introduction

DIPRANE™ 590 is a polyester based urethane prepolymer which can be used for the production of a range of polyurethane elastomers from 45 Shore A to 55 Shore D hardness. The system has been specially developed for applications requiring a high degree of dynamic performance coupled with excellent physical properties and abrasion resistance. DIPRANE™ 54 Prepolymer can be reacted with DIPRANE™ C590/45 curative to produce an elastomer of 50°A and with increasing quantities of DIPRANE™ CA chain extender as a third component to allow the production of elastomers up to 55 Shore D hardness.

DIPRANE 590 SERIES
Three Component Elastomer System with DIPRANE 54 Prepolymer

Component Properties

Polyol Component

Product Reference	DIPRANE™ C590/45 Polyol
Appearance	Whitish, waxy solid at 20°C Hazy, amber liquid at 40°C
Viscosity	25 – 35 poise at 40°C
Specific Gravity	1.16 – 1.18 at 40°C

Isocyanate Component

Product Reference	DIPRANE™ 54 Prepolymer
Appearance	Pale, amber liquid
Isocyanate Content	21.3 – 21.7%
Viscosity	6 - 8 poise at 25°C
Specific Gravity	1.20 – 1.22 at 25°C

These are typical values and should not be construed as specifications.

Mixing Ratios

DIPRANE™ 590 can be blended in the following proportions to give a range of hardness from 50°A to 55D with DIPRANE™ 54 Prepolymer

Hardness	**50A**	**55A**	**60A**	**65A**	**70A**	**75A**	**80A**	**85A**	**90A**	**95A**
DIPRANE™ C590/45 Polyol	473.4	301	237.5	182.5	157.6	139.2	107.6	88.9	73	59.3
DIPRANE™ CA	0	8.2	11.7	13.8	14.99	15.78	17.32	18.2	18.96	19.62
DIPRANE™ 54 Prepolymer	100	100	100	100	100	100	100	100	100	100

These are typical values and should not be construed as specifications.

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

Cured System – Typical Properties with DIPRANE™ 54 Prepolymer

Property	Test Method	Value					Unit
Hardness	**ISO 868**	**50A**	**55A**	**60A**	**65A**	**70A**	
100% Modulus	ISO 527 – Type 5 (2mm)	1.37	1.58	2.2	3.4	4.13	MN/m2
300% Modulus	ISO 527	2.36	2.95	5.2	7.9	10.9	MN/m2
Tensile Strength	ISO 527	21.4	24	33	36	36	MN/m2
Elongation at Break	ISO 527	650	560	520	460	410	%
Angle Tear Strength	ISO 34 – Pt B, Proc A	35	42	47	50	52	KN/m
Compression Set 22 hrs at 70°C	ASTM D395	30	35	35	35	35	%
DIN Abrasion	ISO 4649	<30	<30	<30	<30	<30	mm3

Property	Test Method	Value					Unit
Hardness	**ISO 868**	**75A**	**80A**	**85A**	**90A**	**95A**	
100% Modulus	ISO 527 – Type 5 (2mm)	4.6	6	10.3	11.5	14	MN/m^2
300% Modulus	ISO 527	12.5	14	22.8	24	28	MN/m^2
Tensile Strength	ISO 527	36	36	37	38	32	MN/m^2
Elongation at Break	ISO 527	390	390	380	375	350	%
Angle Tear Strength	ISO 34 – Pt B, Proc A	54	75	82	90	96	KN/m
Compression Set 22 hrs at 70°C	ASTM D395	35	35	35	38	40	%
DIN Abrasion	ISO 4649	<30	<30	<30	<30	<30	mm^3

These are typical values and should not be construed as specifications.

Processing Details

Please Note: It is advisedl that the polyol component is thoroughly rolled / mixed before use.
Strong turbulence and mixing with air should be kept to a minimum by adopting a careful mixing technique (e.g. drum/keg rolling) or using low air introducing mixers. It is recommended that any air introduced during mixing is subsequently removed through degassing by either machine or vacuum chamber. It is the responsibility of the customer to ensure that the product is mixed and degassed sufficiently for use.

The following information is given as a guide to processing this product. It is recommended that optimum conditions for a specific application are determined experimentally. Our Technical Service Department can offer more detailed advice.

Recommended Processing Temperatures

Polyol Component	50 – 55°C
Isocyanate Component	50 – 55°C
Chain Extender Component	25 – 30°C
Mould Temperature	85 – 95°C
Gel Time	3 – 8 minutes
Typical Demould Time	15 – 40 minutes

These are typical values and should not be construed as specifications.

Recommended Cure Cycle

In order to achieve rapid attainment of mechanical properties of DIPRANE™ 590 castings, a post-cure of 12 -16 hours at approximately 80°C is recommended followed by a minimum of 48 hours at ambient temperature. It is important that moulds be heated to the recommended temperature in order to achieve satisfactory demould times and subsequent curing of the elastomer.

Additional Processing Details

Machine Mixing

Our Technical Service Department can offer advice on suitable two or three component polyurethane dispensing equipment for processing DIPRANE™ 590 series elastomers

Hand Mixing

When hand mixing, the following procedures should be adhered to:

1) Precondition the components to the recommended temperature.
2) DIPRANE™ C590/45 Polyol should be mixed by rolling the drum before use.
3) Weigh out the required quantities of DIPRANE™ C590/45 Polyol and DIPRANE™ CA into the mixing vessel and mix together.
4) Weigh the required amount of DIPRANE™ 54 Prepolymer into the vessel and mix thoroughly for approximately one minute.
5) Put the mixture under vacuum (5 Torr min) for 1 - 2 minutes or until bubbling ceases.
6) Pour the reaction mixture into heated moulds, which have been treated with mould release agent.

Storage and Handling		**Shelf life**
Polyol Component	Store in tightly sealed containers at a temperature of 0 - 30°C. Raise to the processing temperature and mix well before use. Avoid contact with moisture. Storage at low temperatures may result in freezing of the polyol component, should this occur it should be melted out by raising to the processing temperature and mixed thoroughly before use.	12 months
Isocyanate Component	Store in tightly sealed containers at a temperature of 15 - 30°C. Avoid contact with moisture. Storage below the recommended minimum temperature may result in freezing of the Isocyanate. If the Isocyanate does not fully melt out when raised to the processing temperature it may be necessary to re-melt at a temperature of 60 - 70°C following the procedures laid down in the information sheet 'Safe Handling – Pure, Modified and Polymeric MDI' Form No. 109-01224X-1009P&M.	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

More detailed information on the storage and handling of polyurethane components can be obtained by contacting Dow Technical Service Department.

Packaging

Polyol Component	25 kg, 225 kg
Isocyanate Component	25 kg, 240 kg
Chain Extender Component	25 kg, 205 kg

Product Stewardship

The Dow Chemical Company and its subsidiaries ("Dow") has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our Product Stewardship program rests with each and every individual involved with Dow products — from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Safety Considerations

Safety Data Sheets (SDS) are available from The Dow Chemical Company (Dow). SDS are provided to help customers satisfy their own handling, safety and disposal needs, and those that may be required by locally applicable health and safety regulations. SDS sheets are updated regularly. Therefore, please request and review the most current SDS before handling or using any product. Copies of the SDS are available on request through the nearest Dow Sales office.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to help ensure that Dow products are not used in ways for which they were not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products.

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