PRODUCT INFORMATION

PROVISIONAL TECHNICAL DATASHEET
3/15/2016

Introduction

DIPRANE™ 641 is a non-mercury catalysed, polyester polyol based system offering excellent flame retardance and anti-static properties. DIPRANE™ 640 Prepolymer* can be reacted with DIPRANE C641/50 polyol to produce an elastomer of 50°A and with increasing quantities of DIPRANE™ C chain extender as a third component to allow the production of elastomers up to 95 Shore A hardness.

DIPRANE™ 640 DTH Catalyst introduced at the mixing head can optionally be utilized to tailor the reactivity to suit the moulding process.

DIPRANE 641 SERIES
Three Component
Elastomer System

Component Properties

Polyol Component

Product Reference	DIPRANE™ C641/50 Polyol
Appearance	Off-white liquid at 50°C
Viscosity	25 - 35 poise at 50°C
Specific Gravity	1.2 - 1.3g/ml at 40°C

Isocyanate Component

Product Reference	DIPRANE™ 640 Prepolymer*
Appearance	Pale Amber Liquid at 25°C
Isocyanate Content	16.4 - 16.6 %
Viscosity	23 - 33 poise at 25°C
Specific Gravity	1.18 - 1.20g/ml at 40°C

* as a substitute can be used
DIPRANE™ 530 Prepolymer or
DIPRANE™ 531 Prepolymer

Chain Extender Component

Product Reference	DIPRANE™ C
Appearance	Whitish, Crystalline Solid below 20°C Colourless, Clear Liquid above 20°C
Specific Gravity	1.01 - 1.02 at 20°C

Catalyst

Product Reference	DIPRANE™ 640 DTH Catalyst
Appearance	Colourless to yellowish liquid at 25°C
Viscosity	50 – 80 mPas at 25°C

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

Mixing Ratios

DIPRANE™ 641 can be blended in the following proportions to give a range of hardness from 50°A to 95°A. Ratios are provided in parts by weight and should be measured to an accuracy of ±1%.

Hardness (Shore A)	50	55	60	65	70
DIPRANE™ C641/50 Polyol	430	229	196.8	171.7	156.1
DIPRANE™ C	0	8	9.2	10.3	10.9
DIPRANE™ 640 Prepolymer	100	100	100	100	100

Gel Time	7 - 9 minutes
Typical Demould Time	40 - 60 minutes

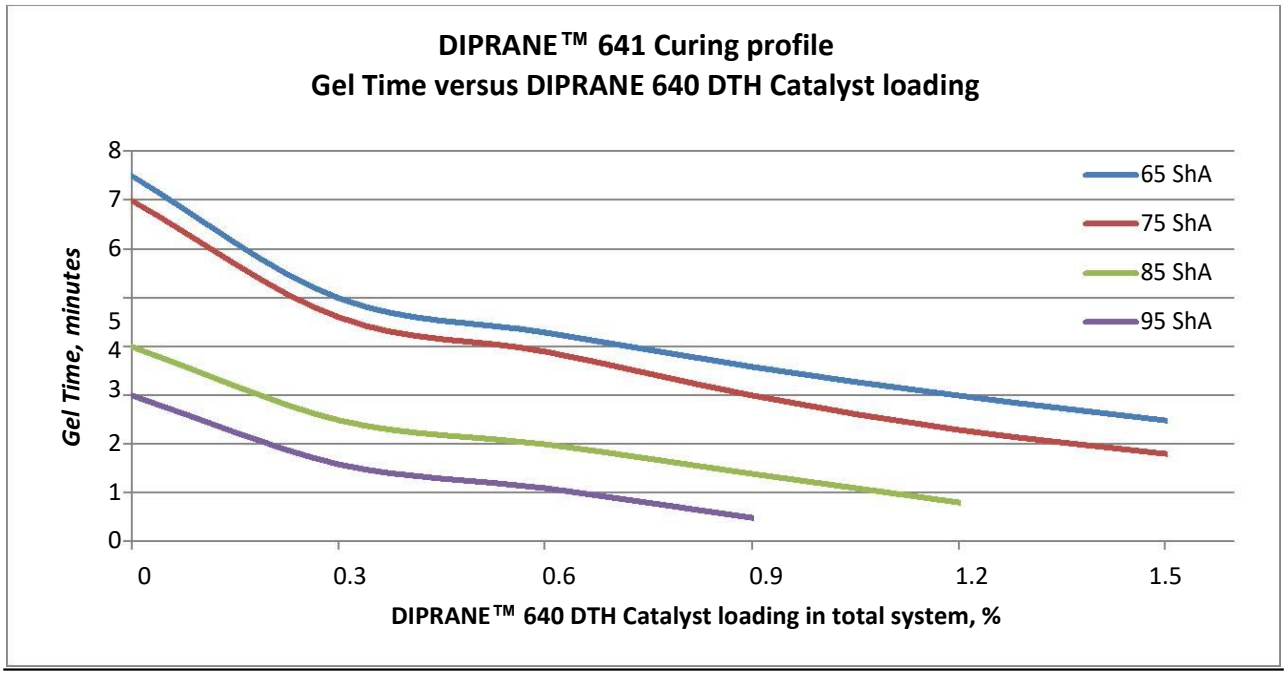
These are typical values and should not be construed as specifications.

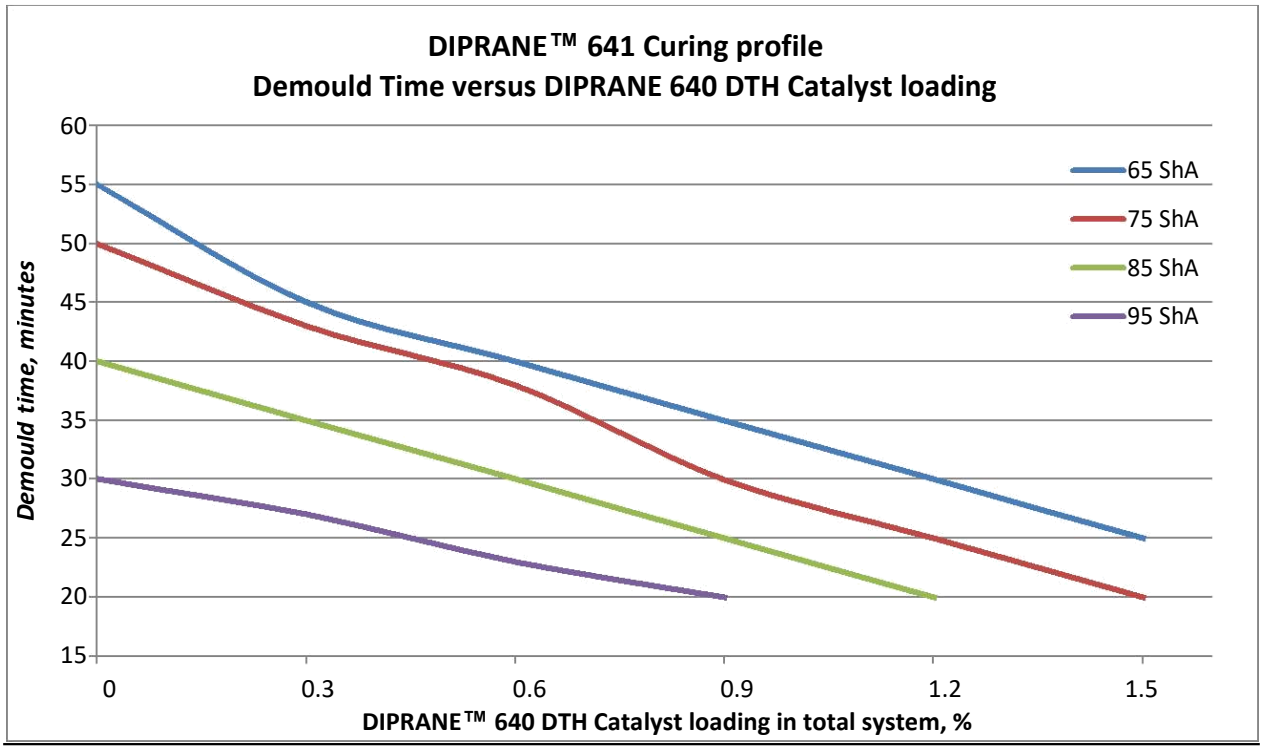
Hardness (Shore A)	75	80	85	90	95
DIPRANE™ C641/70 Polyol	135.3	120.7	90.4	78.9	50.8
DIPRANE™ C	11.7	12.3	13.6	14.1	15.2
DIPRANE™ 640 Prepolymer	100	100	100	100	100

Gel Time	3 - 7 minutes
Typical Demould Time	30 - 50 minutes

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

Example of curing profiles modified by DIPRANE™ 640 DTH Catalyst





Cured System – Typical Properties

Property (Unit)	Test Method	Value				
Hardness (Shore A)	ISO 868	50	55	60	65	70
Tensile Strength (MPa)	ISO 527 type 5 @ 2.5 mm	11	15	19	21	27
100% Modulus (MPa)	ISO 527 type 5 @ 2.5 mm	1.3	1.6	1.8	2.2	2.9
300% Modulus (MPa)	ISO 527 type 5 @ 2.5 mm	2.3	2.6	3.4	4.5	6.3
Elongation at break (%)	ISO 527 type 5 @ 2.5 mm	650	634	603	597	554
Angle Tear Strength (N/mm)	ISO 34	23	28	34	35	45
Compression Set 22 hours at 70°C (%)	ISO 815-1 (Part 1)	12	13	16	19	19
Resilience (%)	ISO 4662	55	50	49	48	48
Abrasion resistance (mm^3)	ISO 4649	83	57	56	52	50
Oxygen Index (%)	ISO 4589	31	30	30	29	29
Flame Retardance	UL 94			V - 0		
Surface Resistivity (Ohm)	BS 903 C1			<6 x 10^7		
Volume Resistivity (Ohm x cm)	BS 903 C1			<1 x 10^8		

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

Cured System – Typical Properties cont.

Property (Unit)	Test Method	Value				
Hardness (Shore A)	ISO 868	75	80	85	90	95
Tensile Strength (MPa)	ISO 527 type 5 @ 2.5 mm	28	28	29	29	30
100% Modulus (MPa)	ISO 527 type 5 @ 2.5 mm	3.5	4.2	5.8	7.8	10.5
300% Modulus (MPa)	ISO 527 type 5 @ 2.5 mm	7.3	8.6	10.4	13	16.3
Elongation at break (%)	ISO 527 type 5 @ 2.5 mm	540	530	530	525	520
Angle Tear Strength (N/mm)	ISO 34	50	58	70	82	92
Compression Set 22 hours at 70°C (%)	ISO 815-1 (Part 1)	20	21	23	27	29
Resilience (%)	ISO 4662	48	47	45	40	35
Abrasion resistance (mm^3)	ISO 4649	47	52	53	56	60
Oxygen Index (%)	ISO 4589	28	28	28	27	27
Flame Retardance	UL 94			V - 0		
Surface Resistivity (Ohm)	BS 903 C1			<6 x 10^7		
Volume Resistivity (Ohm x cm)	BS 903 C1			<1 x 10^8		

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Processing Details

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.

Please Note: It is essential that the polyol component is thoroughly rolled / mixed before use.

A drill mixer should be used for approximately 15 minutes to thoroughly homogenize the Polyol composition before transferring into the machine tank. Strong turbulence and mixing with air should be kept to a minimum by adopting a careful mixing technique or using low air introducing mixers. It is the customer responsibility to ensure that the product is mixed and degassed sufficiently for use.

Recommended Processing Temperatures

Polyol Component	50 – 55°C
Isocyanate Component	40 – 55°C
Chain Extender Component	25 - 35 °C
Mould Temperature	85 – 95°C

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

Additional Processing Details

Machine Mixing

Our Technical Service Department can offer advice on suitable two or three component polyurethane dispensing equipment for processing DIPRANE™ 641 series elastomers.

Hand Mixing

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

1) Precondition the components to the recommended temperature.
2) DIPRANE™ C641/50 Polyol should be mixed before use.
3) Weigh out the required quantities of DIPRANE™ C641/50 Polyol and DIPRANE™ C into the mixing vessel and mix together.
4) Weigh the required amount of DIPRANE™ 640 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.

Recommended Cure Cycle

To help achieve rapid attainment of mechanical properties, it is recommended that a post-cure of 12 -16 hours at approximately 80°C is followed by conditioning at room temperature for 7 days. It is important that moulds be heated to the recommended temperature to help achieve satisfactory demould times and subsequent curing of the elastomer.

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, 230 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.

Contact information:
For more information about this product please call The Dow Chemical Company.

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