



Dow Polyurethanes

Dow Engineering Elastomers

Material handling & industrial engineering



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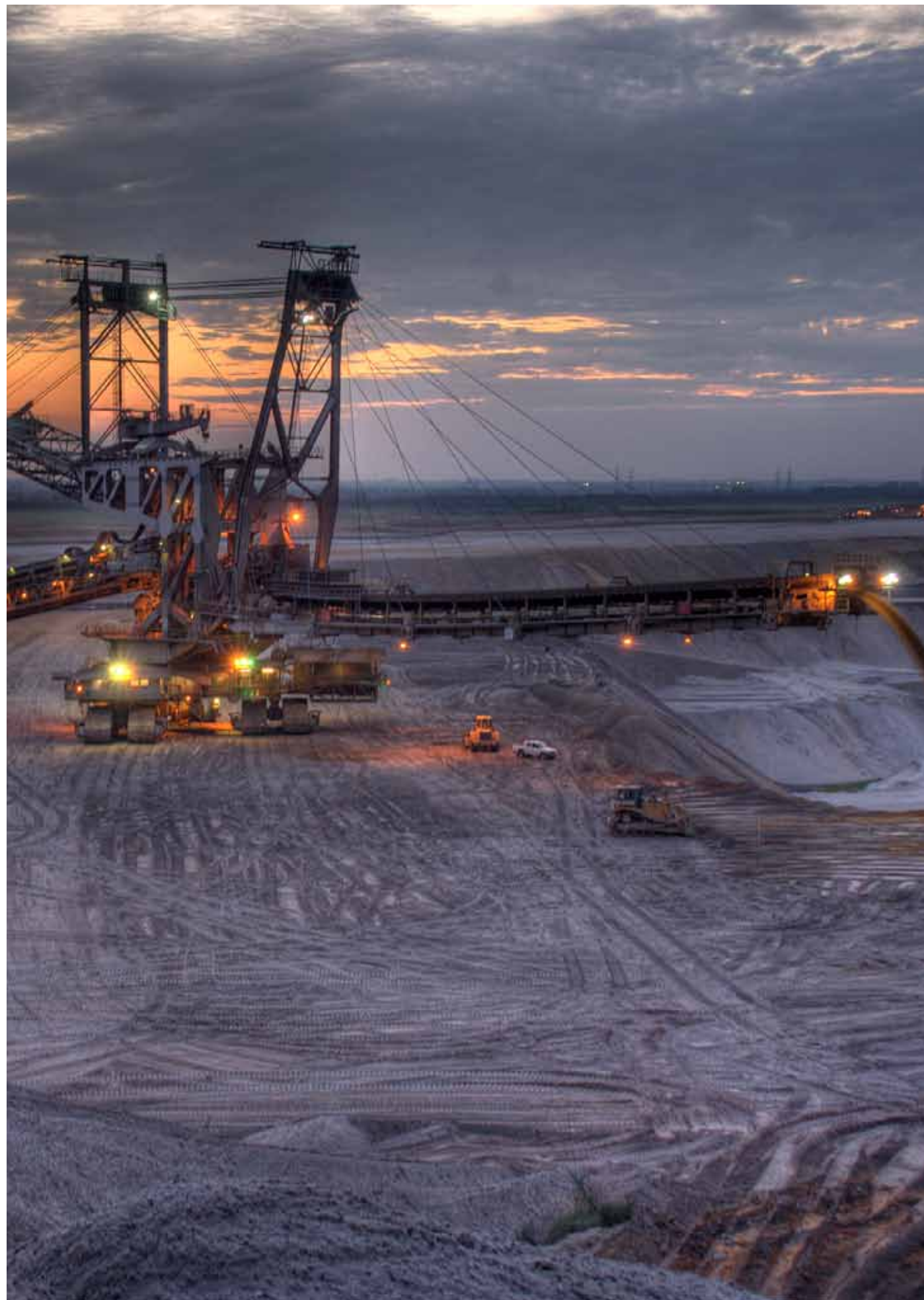
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Introduction

Dow Polyurethanes, a global business unit of The Dow Chemical Company, is an industry leader in the development and formulation of fully-formulated polyurethane systems, focused on providing its customers worldwide with innovative, tailor-made solutions through a global network of systems houses.

Dow Polyurethanes provide application development and processing support to grow your business, with a range of innovative solutions for the most demanding industrial engineering applications. With more than 40 years experience in the development of polyurethane elastomer systems our products are used internationally for wear and tear protection in automotive, mining, material handling, offshore and industrial engineering applications.

Acting as interpreter between chemist and engineer, we adapt and use the versatility of polyurethane chemistry to provide practical solutions to industrial applications. By choosing Dow Polyurethanes, you'll have access to reliable service, creative polymer design, and the vast resources of one of the world's largest and most respected chemical companies.



Polyurethane Systems

Dow's polyurethane elastomer range of prepolymer and quasi prepolymer systems have been developed to offer improved processing characteristics and maximize the performance of the resulting elastomer in the most cost effective manner. The prepolymers and systems have been developed from a variety of polyol backbones and isocyanates.

HYPERLAST™ prepolymers and systems are predominantly based on polyether chemistry. They yield elastomers with excellent dynamic performance and toughness through to more cost effective polyether polyols which offer very good all round performance - especially in cold and wet environments.

DIPRANE™ prepolymers and systems are based on polyester or polycaprolactone chemistry to yield elastomers that are suitable in applications requiring a high degree of wear and tear resistance. Typical examples include ore and mineral extraction processes. They can also be tailored to provide elastomers capable of excellent solvent resistance or anti-static properties.

ROTAKOTE™ rotationally cast polyurethane systems have been specifically developed for the production of industrial material handling rollers such as used in the steel, paper, and timber industries. They are capable of excellent dynamic and heat stability, while also offering superb abrasion and hydrolysis resistance.

DURAMOULD™ polyurethane systems for mould making, rapid prototyping, pattern making and tooling offer the end-user easy processing with the confidence of long-lasting moulds capable of providing excellent reproduction of fine detail.

MONOTHANE™ single component elastomer has been used globally by processors of rubber and polyurethane for over 35 years. It allows the complexity of polyurethane to be used simply to manufacture a broad range of engineering components from printing rollers to isostatic press bags.

DYNATHANE™ micro-cellular elastomers provide a simple solution to impact, shock, noise and vibration problems and are suitable for a wide range of applications particularly in the mechanical engineering, construction and leisure industries.



Full Prepolymers

HYPERLAST™ prepolymers

HYPERLAST T and M prepolymers are derived from the reaction of polyether polyols with TDI or MDI.

The prepolymers that are based on polyoxytetramethylene glycol (PTMEG) polyols take full advantage of its strength in:

- **Dynamic performance**
- **Resilience**
- **Hydrolysis resistance**
- **Low temperature performance**

This class of prepolymer is ideal for high speed/high load bearing applications, and in environments where elastomers are exposed to moisture or low temperature, or a combination of both.

DIPRANE™ prepolymers

DIPRANE T and M prepolymers are derived from the reaction of polyester or polycaprolactone with TDI or MDI

These tough and durable elastomers are designed to maximize resistance to:

- **Wear**
- **Cut and tear**
- **Flex fatigue**
- **Organic chemicals**

This excellent dynamic performance makes them suitable for a range of applications such as wheels, rollers and mining equipment - typically screens, scrapers and conveyors.



TDI and MDI Prepolymers

HYPERLAST™ polyether and DIPRANE™ polyester based prepolymer systems are specifically formulated to offer excellent dynamic and mechanical performance with the advantages of tolerance to processing conditions and ratio.

HYPERLAST™ T and DIPRANE™ T features guide

	HYPERLAST T830 series	HYPERLAST T140 series	HYPERLAST T170 series	HYPERLAST T890 series	DIPRANE T950 series	DIPRANE T240 series
Hardness	75-95A	75A -75D	80 - 95A	85A	60-95A	57-95A
Ambient processing	✖	✖	✖	✖	✖	✖
Hand process	✓	✓	✓	✓	✓	✓
Machine process	✓	✓	✓	✓	✓	✓
Dynamic Performance	..	...	...	..	...	..
Solvent resistance	✖	✖	✖	•	..	..
Fire retardant	✖	✖	✖	✖	✖	✖
Anti static	✖	✖	✖	✖	✖	✖
Low temperature flex	...	...	...	..	..	..
Abrasion resistance	•	..	..	...	...	...
Tear resistance	•	..	..	..	...	...

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓	•

HYPERLAST™ M and DIPRANE™ M features guide

	DIPRANE M450	DIPRANE M540	HYPERLAST M440	HYPERLAST M460
Hardness	95A	85 & 95A	85A – 60D	93A
Ambient processing	✖	✖	✖	✖
Hand process	✓	✓	✖	✓
Machine process	✓	✓	✓	✓
Dynamic Performance	...	..	...	•
Solvent resistance	..	..	✖	..
Fire retardant	✖	✖	✖	✖
Anti static	✖	✖	✖	✖
Low temperature flex	..	•	..	•
Abrasion resistance	...	...	...	..

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓	•

Quasi Systems

Dow offers an extensive range of quasi prepolymer systems.

A quasi prepolymer system can provide certain advantages over and above the more conventional full prepolymer systems by offering:

- **Lower viscosity prepolymers and curatives**
- **Lower material temperature for processing**
- **Close mix ratios**
- **Multi-hardness elastomers from the same prepolymer**

These systems can be tailored to meet specific solutions for a variety of engineering applications.

HYPERLAST Quasi polyurethane systems

HYPERLAST™ quasi polyurethane systems based on polyether polyols can produce elastomers that offer the majority of benefits of full prepolymer versions with the processing advantages that quasi systems exhibit.

This type of elastomer has a very good moisture tolerance and cold flexibility making it suitable for applications such as mineral handling (e.g. abrasive slurries), offshore and marine environments.

The following table provides an overview of the products.

HYPERLAST™ Series features guide

HYPERLAST	101	152	201	301	LU 1052	LU 1053	LU 1059	7980178
Hardness	60-95A	60A-75D	35-95A	70–90A	55-95A	80A	88A	85A
Ambient processing	✖	✖	..	..	...	...	...	✖
Hand process	✓	✓	✓	✓	✓	✓	✓	✖
Machine process	✓	✓	✓	✓	✓	✓	✓	✓
Multi component available	✓	✓	✖	✖	✓	✖	✖	✖
Solvent resistance	✖	✖	✖	✖	✖	✖	✖	✖
Fire retardant	✖	✖	✖	✖	✖	✖	✖	✖
Anti static	✖	✖	✖	✖	✖	✖	✖	✖
Low temperature flex	..	..	..	...	...	...	...	...
Abrasion resistance	..	...	•	..	•	..	...	..
Tear resistance	..	..	•	..	..	..	..	..
Dynamic/resilient	...	...	..	...	..	✖	✖	✖
Hydrolysis resistant	...	...	...	..	..	...	...	...

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓	•

The above table is not extensive but gives an indication of the various series available. Dow sales and technical teams will work with you to select and adapt the materials to meet your specific requirements.

Quasi Systems

Dow offers an extensive range of quasi prepolymer systems

DIPRANE™ Quasi polyurethane systems

DIPRANE™ quasi polyurethane systems based on polyester polyols produce elastomers that are mechanically tough, durable and have a good degree of chemical resistance. This makes them ideal for a variety of material and mineral handling applications such as pipeline scrapers, mining screens, rollers, belt scrapers and squeegees.



DIPRANE™ Series features guide

DIPRANE	300	310	590	598	641	642	LC 1007	LC 1013
Hardness	55-95A	45-90A	45A-55D	45A-55D	50 – 95A	50 - 95A	45A-55D	55 – 95A
Ambient processing	✖	✖	✖	✖	✖	✖	✖	✖
Hand process	✓	✓	✓	✓	✓	✓	✓	✖
Machine process	✓	✓	✓	✓	✓	✓	✓	✓
Multi component available	✓	✓	✓	✓	✓	✓	✓	✓
Solvent resistance	...	..	.	.	.	.	.	.
Fire retardant	✖	✖	✖	✖	...	...	✖	✖
Anti static	✖	✖	✖	✖	...	...	✖	✖
Low temperature flex	.	.	.	.	.	.	.	.
Abrasion resistance	.	..	...	...	..	...	...	...
Tear resistance	.	..	..	..	.	..	..	..
Food contact compliant	✖	✖	✖	EU Directive 10/2011	✖	✖	✖	✖

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓

The above table is not extensive but gives an indication of the various series available. Dow sales and technical teams will work with you to select and adapt the materials to meet your specific requirements.

High Performance Sprayable Coatings

The HYPERLAST™ and DIPRANE™ range of sprayable polyurethane systems offer a range of rapid cure and fast drying coatings suitable for various industrial and automotive protective applications. They have been developed to help protect and extend the design life of a variety of substrates. These products are formulated without the use of solvents.

HYPERLAST™ sprayable polyurethane systems are predominantly based on polyether chemistry. They yield elastomers with remarkable dynamic performance and toughness through to polyether polyols which offer very good all round performance - especially in cold and wet environments.

DIPRANE™ sprayable polyurethane systems are based on polyester or polycaprolactone chemistry to yield elastomers that are suitable in applications requiring a high degree of wear and tear resistance. Typical examples include floatation tank linings.

They can also be tailored to provide elastomers for example with improved chemical resistance or fire retardant properties.

The HYPERLAST™ and DIPRANE™ range of tough, durable coatings offer:

- **Fast installation**
- **Non-slumping**
- **Fast return to service**
- **Non-solvented high build**
- **Corrosion protection**
- **Chemical resistance**
- **Reduced noise transmission**

BRAND	HYPERLAST™					DIPRANE™		
Product Family	TMP 85	TMP 82	EMH 85, 95 & 80D	TMH 85	EHU 60	SMP 83E	SMP 85E	SMP FR 88
Hardness Shore A (D)	85	82	85A, 95A & 80D	85	60D	83	85	88
On-site process	✖	✖	✓	✖	✓	✖	✖	✖
Ratio 1:1 by volume	✖	✓	✓	✓	✓	✖	✓	✖
High Pressure apply	✓	✓	✓	✓	✓	✖	✓	✖
Low Pressure apply	✓	✓	✓	✓	✓	✓	✖	✓
Hydrolysis Resistance	...	...	...	...	...	.	.	.
Fire Retardant	✖	✖	✖	✖	✖			...
Low Temperature Flex	..	..	...	..		.	.	.
Abrasion Resistant	...	...	.	..	.	...	...	..
Tear Resistant	..	..	.	..	.	..	..	..
UV Stable					...			

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓



ROTAKOTE™ Rotationally Cast Polyurethanes

Dow has developed a range of rotational cast urethanes for the production of industrial material handling rollers such as used in the steel, paper, and timber industries.

The roll covers produced from ROTAKOTE™ polyurethane elastomers offer excellent dynamic and heat stability, while also providing superb abrasion and hydrolysis resistance.

Benefits of rotational cast rollers:

- **Fast material preparation**
- **No mould preparation**
- **Optional post-cure**
- **High dynamic properties**

ROTAKOTE	K3	5286	P 5600
Hardness	65-95A	70A-70D	95A, 70D
Ambient processing	✖	✖	✖
Hand process	✖	✖	✖
Machine process	✓	✓	✓
Multi component available	✓	✓	✖
Solvent resistance	•	•	••
Abrasion resistance	•••	••	••
Tear resistance	••	•••	••
Hydrolytic stability	••	••	•••
High temperature resistance	••	••	•••
Dynamic properties	•••	••	•

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓	•	••	•••



DURAMOULD™ Polyurethane Systems for Mould Making & Prototyping

Hand mixable and machine mixable DURAMOULD systems from Dow offer a range of flexible to rigid products enabling effective production of moulds and mouldings that give excellent reproduction of fine detail.

The DURAMOULD™ range offers:

- **Easy ratio**
- **Room temperature castable**
- **Moisture tolerant**
- **Finger print reproduction**
- **Minimal shrinkage**
- **Quick gel and demould**
- **High production rates**
- **Excellent resistance to release oils**



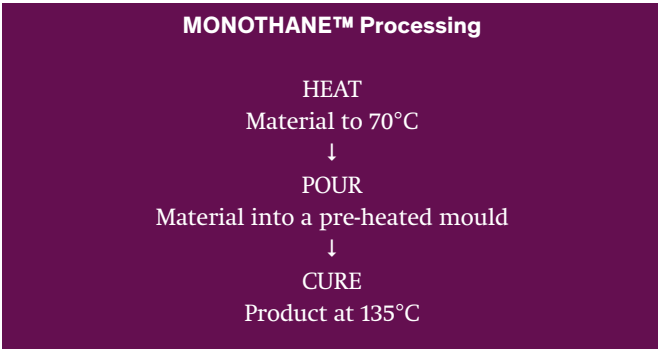
DURAMOULD	EMF 85D	EM 75D	ET 30A	ET 1045	ET 1060	SM 25	SMX 45
Colour			Yellow	Red			
Hardness	85D	75D	30A	45A	60A	25A	45A
Hand Process	✓	✓	✓	✓	✓	✓	✓
Machine Process	✓	✓	✓	✓	✓	✓	✓
Abrasion Resistance	•	•	•	•	•	••	••
Tear Resistance	•••	•••	•	•	•	••	••
Low Temperature Flex	✖	✖	•••	•••	•••	••	••
Fire retardant	✓	✖	✖	✖	✖	✖	✖

Key	No/Unsuitable	Yes	Good	Very Good	Excellent
	✖	✓	•	••	•••

MONOTHANE™ - The Single Component Elastomer

MONOTHANE allows the complexity of polyurethane to be used simply to manufacture a broad range of engineering components from printing rollers to isostatic press bags.

The simplicity of MONOTHANE™ single component elastomer allows moulders to engineer a casting through a simple, 3 step process: heat - pour - cure. No weighing, mixing, vacuum degassing or dispensing equipment is required. Only an efficient air-circulating oven is needed for meltdown and curing.



As MONOTHANE™ elastomer is cured, it goes through a thinning stage which naturally degasses the product providing customers with a bubble-free casting with uniform physical properties. Once cured, the material can be ground and polished to address end-use needs. Color additives can also be introduced by the end user to enhance the visual appearance or address customer requirements.

The single component MONOTHANE™ system is based on formulated polyurethane elastomer available in the hardness range of 20 –90 Shore A.

Examples of end-use applications in which MONOTHANE™ single component elastomer is used include:

- **Printing rollers**
- **Anti-vibration mountings**
- **Steel mill rollers**
- **Gaskets**
- **Isostatic press bags**
- **Seals**
- **Paper rollers**
- **O Rings**
- **Conveyor rollers**
- **Paint application rollers**

DYNATHANE™ Microcellular Elastomers

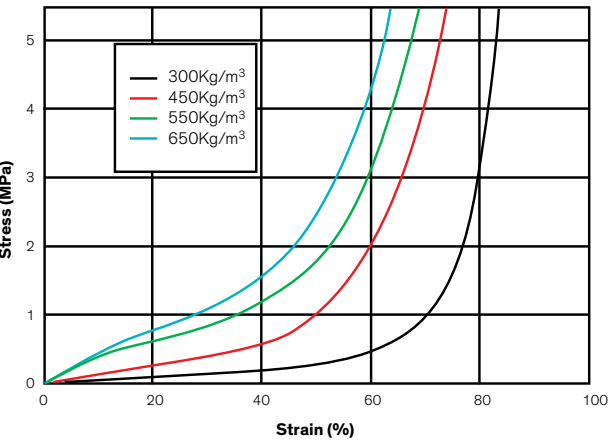
DYNATHANE polyurethane microcellular elastomer is designed to offer an effective yet simple solution to many vibration and noise problems. Major potential uses include vibration control in mechanical engineering, construction and leisure industries, for example machine tool mountings and isolation of motors and compressors.

- **High tensile and tear strength***
- **Excellent abrasion resistance***
- **Excellent low temperature flexibility**
- **Excellent hydrolytic stability**
- **High volume compressibility**
- **Progressive load deflection characteristics**
- **Excellent fatigue life under dynamic deformation**

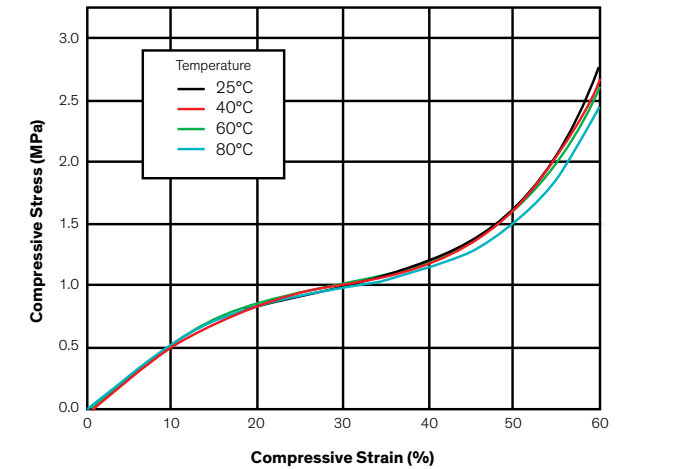
* in comparison to other foams



DYNATHANE™ 1000 - Compressive Stress / Strain



DYNATHANE™ 1000 - Compressive Stress vs Strain



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

Contact us

We have described briefly the ranges of prepolymer and quasi prepolymer systems that have been developed to meet your engineering needs.

As part of The Dow Chemical Company we have local Dow technical people ready to help you.

