Era
Elastomers

A New Era in Polyurethane

Elastomers

VERSION 6.1

Contents

Excellence in Polyurethane Chemistry

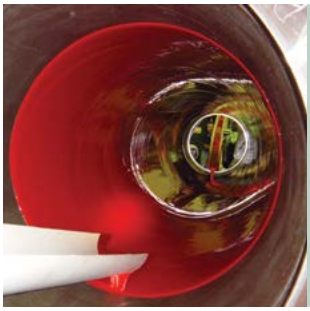
Era Polymers is an Australian owned and operated company specialising in the field of Polyurethane Chemistry. The company was started in April 1986, in a home office, by George and Tina Papamanuel. Since those humble beginnings it has grown to become the largest Polyurethane Systems House in Australia.

We pride ourselves on our enviable reputation for outstanding product quality. Era Polymers is a broadly based Polyurethane Systems House, exporting products and providing technical service to over 70 countries worldwide.

Era Polymers operates six divisions within the company: **Elastomers**, **Foams**, **Coatings & Membranes**, **Machinery**, **Trading** and **Toll Manufacturing**. We have four state of the art manufacturing facilities: two are located in the Sydney suburb of St Marys, one in Melbourne and one in Auckland, New Zealand. Our Research and Development Centre is also based in Sydney, NSW. Additional Sales Offices are based in Adelaide, Auckland, Brisbane, Melbourne, and Singapore. Stock is warehoused in all capital cities of Australia, as well as Belgium, Canada, China, Dubai, Malaysia, New Zealand, South Africa and the USA. Our customers worldwide are serviced by our extensive distributor network.

In an increasingly impersonal world,
Era Polymers is dedicated to the principle –
Business, is people doing business with people.

Applications



Superior cost advantage and performance has led to many instances of replacing metal, rubber, wood and plastic with Erapol elastomers. Some applications are shown in the table below.

Industry	Applications
Automotive	Grommets, bearings, bushes, flexible couplings.
Building and Construction	Moulds for concrete, gate seals, concrete pump parts, waterproofing.
Coated fabrics	Conveyor belts, fuel storage tanks, power transmission belts.
Electrical	Encapsulation, insulation, potting, cable joining.
Engineered Components	Gears, sprockets, wire guides, rail draft gear, stripper plates, press brake pads, textile yarn guides, cutting boards, business machine belts, couplings.
Food	Chute lining, grain buckets.
Mining	Bucket liners, conveyor rollers, scraper blades, floatation cell impellers, pump linings, grading screens, lined pipes, cross-over pads.
Oil, Chemical and Marine	Bushings, bearings, hydrocyclones, buoys, pipeline pigs and scrapers, fenders, valve seats.
Rollers	Board rollers, nip rollers, metal forming, printing, conveyor, can coating, paper mill.
Seals and Gaskets	Pneumatic and oil seals, diaphragms.
Footwear	Shoe soles, bottom moulding diaphragms, wear plates, energy absorbing insoles.
Wheel and Tyres	Fork-lift tyres, heavy duty castor wheels, escalator wheels, roller skate wheels, roller blade wheels.

What are Polyurethanes?

To the Chemist:

They are polymeric materials containing urethane groups

produced by the reaction of a polyol with an isocyanate.

To the Engineer:

They are materials offering a number of unique properties which enable products to be manufactured to meet a range of demanding applications.

To the Accountant:

They are materials which can be processed with low energy consumption and relatively low capital outlay for machinery to yield products which show cost saving through improved performance.

Polyurethane Elastomers are unique design and construction materials combining many of the advantages of rigid plastics, metals and ceramics with the extensibility of rubber.

While it is not claimed that polyurethanes are the answer to all problems, they are extremely versatile and this is the key to their widespread and growing use.

The main types of polyurethanes are:

- POLYETHER/TDI
- POLYETHER/MDI
- POLYESTER/TDI
- POLYESTER/MDI
- POLYCAPROLACTONE/TDI
- POLYCAPROLACTONE/MDI
- ALIPHATIC SYSTEMS
- POLYUREA SYSTEMS

These are also known as the "chemical backbones". Each has its own performance advantages. Please consult the **Era Polymers Technical Service Department** for specific recommendations.

As a general guide:

Polyethers are recommended for applications where parts undergo dynamic stress, i.e. they incur lower heat build-up. They also have advantages in high resilience, low temperature performance and resistance to water attack (hydrolysis). Polyethers also have lower viscosity and specific gravity.

Polyester based urethanes have superior cut, tear, abrasion, oil and solvent resistance.

MDI based products have lower isocyanate odour than similar TDI types and have superior hydrolysis resistance and often have higher resilience.

TDI based products are less sensitive to moisture, have shorter demould times and lower cure temperature requirements compared to MDI types.

Polycaprolactones exhibit good cut, tear, load bearing and abrasion resistance with the added advantage of better hydrolysis resistance when compared to Polyesters.

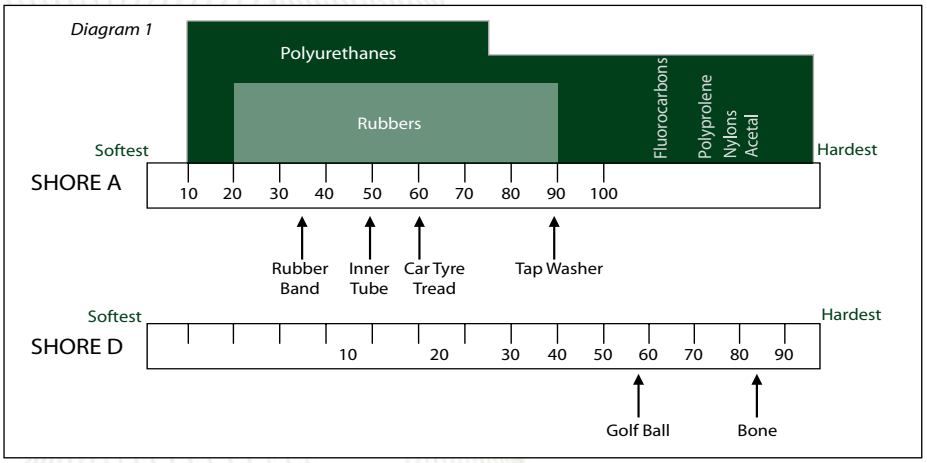
Aliphatic Systems have high resistance to weathering, high chemical resistance and durability in aggressive environments.

Polyurea Systems are fast reacting amine terminated systems used typically in spray applications. These systems have very good water and chemical resistance.

Properties of Erapol Elastomers

Polyurethanes compete against many other materials including rubber, plastic and metals.

The most common method of classifying polyurethanes is according to their hardness. The diagram (right) shows how polyurethanes compare in hardness to other materials.



1. Hardness

Erapol elastomers are available in a wide range of hardness, from 10 Shore A, which is softer than an eraser, to over 85 Shore D which is much harder than a golf ball. For those unfamiliar with this method of measuring hardness, the pictures to the right show two typical Durometers.

Hardness measurement is a useful tool, however variation in readings by one or two units can be encountered when measuring most polyurethane and rubbers.

Shore A is the most common hardness scale for use up to 95 – 100 Shore A. Any reading above this hardness level should be measured in Shore D scale. The comparison between the two scales is outlined above in *Diagram 1*.

Analog Hardness Tester

Digital Hardness Tester

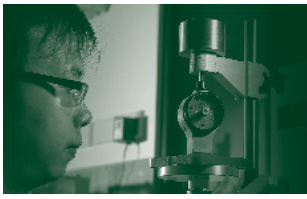
DIN Abrasion Testing Machine

Taber Abrasion Testing Machine

2. Abrasion Resistance

In severe wear applications ***Erapol*** elastomers offer outstanding durability when compared with rubbers, plastics or even metals.

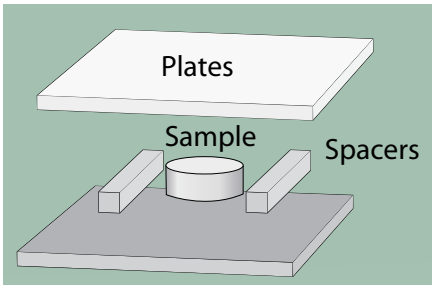
It should be emphasised that abrasion resistance is a complex property. Selection of an appropriate ***Erapol*** elastomer should be based on actual experience or simulated service tests. For comparative abrasion data please see Resistance Charts on pages 32 – 33.



Properties of Erapol Elastomers

3. Compression Properties

Erapol elastomers exhibit greater load-bearing capacity than conventional elastomers of equal hardness. This leads to successful applications such as wheels and industrial tyres, feed rollers and stripper springs. In addition to high load bearing properties in both tension and compression, ***Erapol*** elastomers also have a high load bearing capacity in shear.



1. Compression Set

(ASTM D-395 Method B)

Measures the amount of permanent deformation a part will undergo when loaded for a period of time. In ASTM D-395 Method B (see above) a load is generated by imposing a 25% compression on the sample.

2. Compression Deflection

(ASTM D-575)

This is defined as the compressive load of an initial cross sectional area that is required to produce a stated percentage of elongation. Commonly used elongation are 5%, 10% and 25%.

4. Mechanical Properties

At low hardness all elastomeric materials, including ***Erapol*** elastomers will flex under impact. As conventional elastomers are compounded up to higher hardness they tend to lose elasticity and crack under impact. On the other hand, ***Erapol*** elastomers when at their highest hardness levels, have significantly better impact resistance than almost all plastics.

The inherent toughness, combined with the many other outstanding properties associated with the high hardness ***Erapols***, leads to many applications in engineering.

5. Tear Strength

Typically, tear strength is a strong indication of toughness and durability. High tear strength leads to longer service life. ***Erapol*** elastomers in this regard have a distinct advantage over other conventional elastomers.

6. Resilience

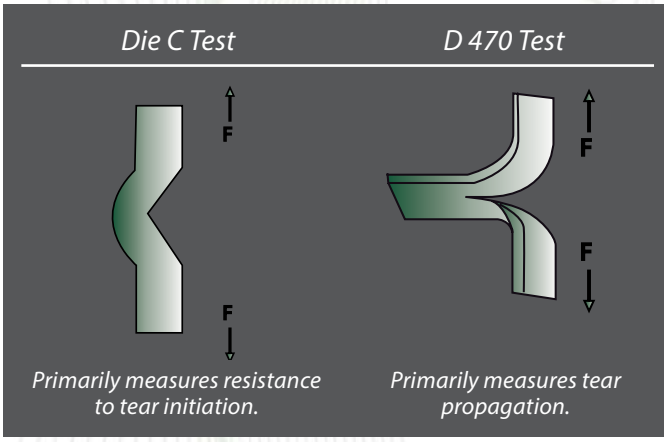
Resilience in conventional elastomers is generally a function of hardness. This often undesirable relationship does not hold true with ***Erapol*** elastomers. Products are available in a wide range of resilience.

In shock-absorbing elastomer applications, low rebound compounds are usually used i.e. resilience range of 10-40%. For high frequency vibrations or where quick recovery is required, compounds of 40-65% resilience are used. In general, toughness is enhanced by high resilience.

7. Low Temperature Properties

Many ***Erapol*** elastomers remain flexible at very low temperatures and possess outstanding resistance to thermal shock. The low temperature resistance of ***Erapol*** elastomers has led to applications below 0°C.

There are two common tests used to measure tear strength:



Properties of Erapol Elastomers

8. Tensile Properties

Erapol elastomers are characterised by high elongation, high tensile strength and high modulus. This provides a combination of toughness and durability, over conventional elastomers.

Tensile tests are performed on a tensometer as shown (see right). In this test we are interested in the shape of the overall stress strain curve (see graphs below). A long plateau followed by a steep rise to break indicates high toughness.

We are also interested in ultimate tensile strength and elongation of the ***Erapol*** elastomers.

Tensile Strength

(ASTM Methods D412 and E6)

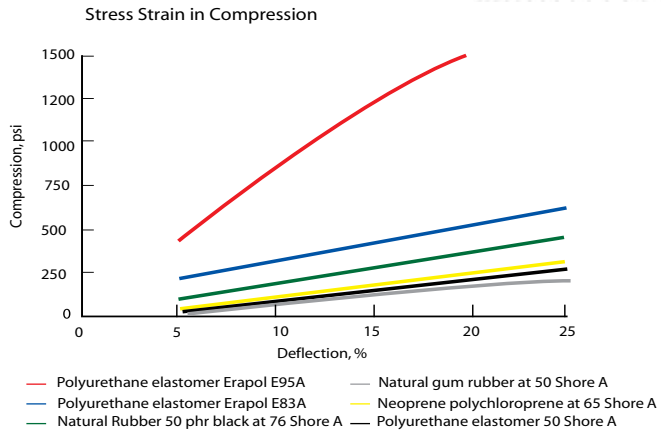
The maximum tensile stress a material is capable of developing. It is the force per unit of the original cross-sectional area which is applied at the time of rupture of a specimen. It is known variously as breaking load, breaking stress and ultimate tensile strength. A dumbell specimen is used for the test.

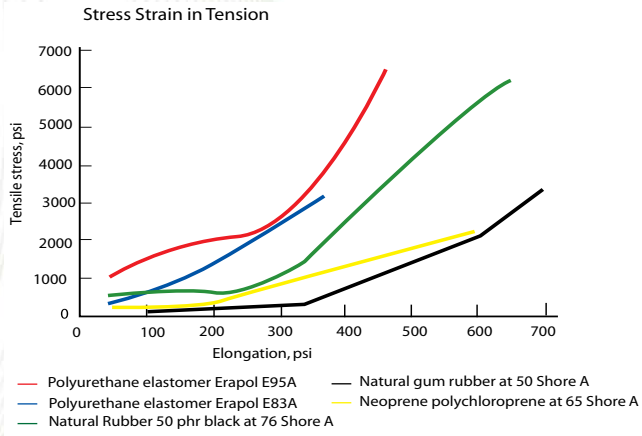
Tensometer

Elongation

(ASTM Method D412)

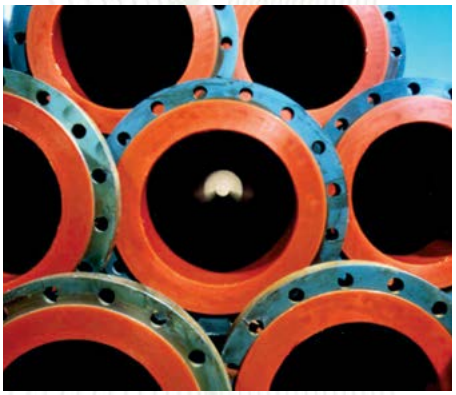
The extension between two points produced by a tensile force applied to a specimen. Measured as a percentage of the original distance between the marks. A dumbell specimen is used for the test. Ultimate elongation is the elongation at the moment of rupture.





9. Flex Properties

Erapol elastomers resist cracking under repeated flexing. The rate of cut growth under flexing may be reduced by decreasing the thickness of the part. Unlike other conventional elastomers, ***Erapol*** elastomers can be used in very thin sections because of their strength and toughness.



10. Dry Heat Resistance

Whilst many ***Erapol*** elastomers are only suitable for continuous operation up to 90°C, intermittent use up to 120°C is possible. Using specially formulated materials, continuous operation up to 120°C or even higher can be achieved.

Properties of Erapol Elastomers

11. Water Resistance

Depending on the type, ***Erapol*** polyether elastomers are resistant to the effects of water immersion and have excellent long-term stability in water up to 50°C. Continuous use in hot water over 80°C is not recommended for standard systems.

Water absorption is very low, in the range of 0.3-1.0% by weight and volume swell is negligible. This means, for example that ***Erapol*** elastomers can operate at close tolerance in water lubricated bearings without fear of seizure.

The moisture vapour transmission rate of ***Erapol*** elastomers is relatively high and advantage is taken of this fact in some applications, e.g. poromeric shoe upper materials. However, where this property might be disadvantageous, the advice of our Technical Service Department should be sought on the suitability of ***Erapol*** elastomers for any particular application.

12. Electrical Properties

Typically ***Erapol*** elastomers have very good insulating properties and are used in potting and encapsulating applications.

13. Oxygen and Ozone Resistance

Products made from ***Erapol*** elastomers are highly resistant to degradation by atmospheric oxygen and ozone. Tests on samples, aged over 500 hours in an atmosphere containing 3ppm ozone, show no attack even while under 20% strain. Past experience has shown that materials which resist the concentration for several hundred hours are virtually immune to attack by normal atmospheric concentrations.

This makes ***Erapol*** elastomers highly successful when employed around electrical equipment, without the hardening and cracking often experienced with conventional elastomers and indeed many plastics.

14. Oil, Grease and Chemical Resistance

Many rubbers and plastics have excellent resistance to one or more specific solvents, oils or chemicals. ***Erapol*** elastomers are resistant to a wide range of chemicals which means they can be used in a multitude of chemical environments with the exception of strong acids, alkalis and certain solvents.

As with all materials being examined for oil and chemical resistance, it is best to place a sample of the material in actual service. If this is not practical, tests should be devised which simulate actual service conditions as closely as possible.

For specific information on chemical resistance, please see the Chemical Resistance Chart on page 35.

Properties of Erapol Elastomers

15. Radiation Resistance

Erapol elastomers are considered to have better resistance to gamma ray radiation than conventional elastomers. They retain a high proportion of their original flexibility and toughness when exposed to gamma radiation.

16. Flame Resistance

Erapol elastomers can be formulated to meet several self extinguishing or fire resistant specifications.

17. Mould, Mildew, Fungus Resistance

Suitably formulated ***Erapol*** elastomers, usually polyether based, do not support fungal growth and are generally resistant to such attack. This makes them particularly suitable for tropical environments.

18. Frictional Properties

Erapol elastomers resemble most plastics and elastomers, in that friction against non-lubricated surfaces generally decrease with increasing hardness. A high coefficient of friction is valuable for such products as solid industrial tyres, feed rollers, drive rollers etc.

High hardness compounds have the lowest coefficient of friction, and formulations having very low values are available. Such formulations are widely used for bushings, bearings and wear strips. Wear of shafts and mating surfaces is minimal, and usually considerably less than with plastic materials.

19. Bonding to other materials

During the initial moulding process and under controlled conditions, ***Erapol*** elastomers can be bonded to a wide variety of substrates. High bond strength can be obtained to most metals, wood and many plastics. Bond strength often exceeds the tear strength of the ***Erapol*** elastomers. The bond strength of ***Erapol*** to metal is usually several times higher than that of rubber to metal.

It is more difficult to bond cured ***Erapol*** elastomer sheet or moulding to other materials but special techniques have been developed to satisfy most requirements.

20. Machinability

Erapol elastomers can be machined using conventional equipment but you should consult our Technical Service Department for more information.

21. Low Temperature Testing

Sub zero temperature testing is primarily designed for foam cryogenic applications where products are routinely analysed at temperatures below -165°C. This allows Era the capability of testing elastomers at elevated temperatures to specific test methods including Tensile, Elongation, Compression and Angle tear (Die C). Elevated and sub zero temperature testing has extended Era Polymer's scope of testing capability, covering most of the elastomer market requirements.

1. Shelf Life and Storage

Most ***Erapol*** brand prepolymers have a shelf life of 12 months when stored unopened in their original containers at temperatures less than 25°C. The isocyanate content of all ***Erapol*** prepolymers will decrease by reaction with moisture or heat. Partial drums should be blanketed with dry nitrogen.

2. Effects of Heating the Prepolymer

The isocyanate (NCO) content of all prepolymers decreases with time and especially with exposure to heat. The table below shows the accumulated time taken at various temperatures to degrade prepolymers.

Temperature/°C	Time
60	7 days
70	3 days
80	36 hours
90	12 hours
100	8 hours

3. Toxicity

Erapol prepolymers contain reactive isocyanate groups and should be handled with care. Avoid inhalation of vapours and skin contact. Appropriate personal protective equipment (PPE) should be worn and adequate ventilation provided. For further information consult the Material Safety Data Sheets.

4. Effects of Curative Level

All physical properties of ***Erapol*** elastomers are sensitive to curative level. The curative level is often expressed as % theory. The table below shows how physical properties vary with % theory.

Physical Properties	Change
Hardness	Remains unchanged between 85-100 %
Tensile Strength	Maximum physical properties achieved between 90-95% theory.
Tear Strength	Maximum properties at 100-105% theory. Significantly lower outside the range.
Abrasion Resistance	Remains relatively unchanged between 85-105% theory. Slightly better at 100-105% theory.
Flex Life	Maximum property at 100-105% theory.
Elongation	Again maximum at 100-105% theory.
Compression Set and Heat Resistance	Best at 85-95% theory.

Product Reference Guide

Era Polymers

TDI Systems

V 4.6 (TDI-1)

Hardness		Cold Castable			Polyether						Polyester			Caprolactone
Shore A	Shore D	CC	CCM	RT	E	EHP	ETX	ET	EMP	ETL	RN	SDR	HTE	ECP
25A														
30A												SDR32A		
35A			CCM35A											
40A			CCM40A											
45A				RT45A										
50A		CC50A		RT50A								SDR50A		
55A			CCM55A									SDR55A		
60A				RT60A										L-E/ECP61A
65A	20D									ETL65A				
70A				RT70A							L-RN71A/RN70A			ECP72A
75A			CCM75A		E77A					ETL75A				
80A	30D	CC80A	CCM80A	RT80A									HTE80A	
82A											RN3038			
83A					L-E/E83A			ET83A	EMP83A		RN83A			ECP83A
85A						EHP85A				L-ETL/ETL85A	L-RN/RN85A			
90A	40D	CC90A	CCM90A	RT90A	L-E/E90A	L-EHP/EHP90A		ET90A	EMP89A		RN90A/RN3039		HTE90A	
91A										L-ETL/ETL91A	L-RN92A			
93A					L-E/E93A	EHP93A			EMP92A					ECP93A
95A		CC95A	CCM95A		L-E/E95A	EHP95A		ET95A	EMP95A	L-ETL/ETL94A	RN95A		HTE95A	ECP95A
100A	50D									ETL100A	L-RN50D/ RN50D/RN3050			
	57D													ECP57D
	60D	CC60D			L-E60D	EHP60D		ET60D						
	65D				L-E65D		ETX65D	ET65D						
	70D					EHP70D	ETX70D	ET70D		ETL69D				
	75D						L-ETX75D/ETX764D	ET75D		ETL75D				
	80D						L-ETX/ETX80D							
	85D						ETX85D							

Cold Castable	Polyether	Polyester	Caprolactones
• **Cast at ambient temperature** • High elongation and flexibility • Low shrinkage • Higher Performance (CC) • Longer Pot Life (CC)	• **Excellent hydrolytic stability** • Fungus resistance • Excellent mechanical properties • Low temperature flexibility • Excellent sliding abrasion resistance	• **Oil/Solvent resistance** • High impact abrasion resistance • Excellent mechanical properties • Temperature resistance • Excellent vibratory dampening	• **High tear strength** • High tensile strength • Oil/Solvent resistance • High impact abrasion resistance • Low heat build up
They are not recommended for abrasive resistance applications	Due to the inherent advantages in low heat build up, polyether-based urethanes are recommended for applications undergoing high stress.	They are not recommended for use in high humidity or exposure to water, as volume swell and reduction of properties may result.	They exhibit excellent mechanical and solvent resistance properties with the added advantage of superior wear and tear.

Product Reference Guide

Era Polymers

MDI Systems

V 4.6 (MDI-1)

Hardness		Polyether		Polyester		Caprolactone	Erakote / Polyether			Erakote / Polyester
Shore A	Shore D	**EMD Full Prepolymer**	**EMD135 Quasi**	**EME Full Prepolymer**	**EME165 Quasi**	**EMC Full Prepolymer**	**EKF 2 Component Full Prepolymer**	**EKQ 2 Component Quasi**	**EKQ 3 Component Quasi**	**EKEQ 3 Component Quasi**
25A										
30A										
35A										
40A					EME165/40A					
45A										
50A										
55A					EME165/55A					
60A			EMD135/60A		EME165/60A			EKQ60A	EKQ-60A	EKEQ-60A
65A	20D		EMD135/65A		EME165/65A			EKQ65A	EKQ-65A	EKEQ-65A
70A			EMD135/70A		EME165/70A			EKQ70A	EKQ-70A	EKEQ-70A
75A		EMD75A	EMD135/75A		EME165/75A			EKQ75A	EKQ-75A	EKEQ-75A
80A	30D		EMD135/80A	EME80A	EME165/80A		EKF80A	EKQ80A	EKQ-80A	EKEQ-80A
85A		EMD85A	EMD135/85A	EME85A	EME165/85A	EMC85A	EKF85A	EKQ85A	EKQ-85A	EKEQ-85A
90A	40D	EMD90A	EMD135/90A	EME90A	EME165/90A	EMC90A	EKF90A	EKQ90A	EKQ-90A	EKEQ-90A
93A		EMD93A								
95A		EMD96A	EMD135/95A	EME95A	EME165/95A	EMC95A	EKF95A	EKQ95A	EKQ-95A	EKEQ-95A
100A	50D	EMD52D								
	57D									
	60D							EKQ60D		
	65D							EKQ65D		
	70D							EKQ70D		
	75D									
	80D									

Polyether	Polyester	Caprolactones
• **Excellent hydrolytic stability** • Fungus resistance • Excellent mechanical properties • Low temperature flexibility • Excellent sliding abrasion resistance	• **Oil/Solvent resistance** • High impact abrasion resistance • Excellent mechanical properties • Temperature resistance • Excellent vibratory dampening	• **High tear strength** • High tensile strength • Oil/Solvent resistance • High impact abrasion resistance • Low heat build up
Due to the inherent advantages in low heat build up, polyether-based urethanes are recommended for applications undergoing high stress.	They are not recommended for use in high humidity or exposure to water, as volume swell and reduction of properties may result.	They exhibit excellent mechanical and solvent resistance properties with the added advantage of superior wear and tear.

Erapol Mix Ratios

Tabulated below are commonly used ***Erapols*** and their mix ratios with the appropriate curatives.

Erapol Grade	Erapol Temperature / °C	Moca (pph)	Ethacure 300 (pph)	% NCO	Moca Pot Life at 80°C / min
E83A	75-85	10.0	8.0	3.10 ± 0.25	15
E90A	75-85	12.5	10.0	4.20 ± 0.20	10
E93A	75-85	15.0	12.0	5.00 ± 0.20	8
E95A	75-85	19.0	15.0	6.25 ± 0.25	6
EHP85A	70-80	11.1	8.9	3.50 ± 0.20	17
EHP90A	75-85	14.0	11.1	4.60 ± 0.20	8
EHP93A	75-85	15.7	12.6	5.20 ± 0.20	8
EHP95A	75-85	17.5	14.1	5.80 ± 0.20	5
EHP60D	60-70	22.7	18.2	7.50 ± 0.25	3
EHP70D	60-70	27.2	22.0	9.00 ± 0.25	2
ET83A	75-85	10.0	8.0	3.10 ± 0.20	8
ET90A	75-85	12.5	10.0	4.20 ± 0.20	6
ET95A	75-85	19.0	15.0	6.25 ± 0.25	4
ET60D	60-65	21.0	17	7.40 ± 0.20	3
ET65D	60-65	22.0	17.5	8.00 ± 0.25	2
ET70D	60-65	25.0	20.0	9.20 ± 0.20	1
ET75D	60-65	30.5	24.5	11.20 ± 0.25	<1
ETX65D	60-65	23.0	18.4	8.00 ± 0.20	4
ETX80D	60-65	26.0	21.0	9.50 ± 0.30	3
ETX85D	60-65	33.0	27.0	12.00 ± 0.30	3
EMP83A	75-85	10.0	8.0	3.20 ± 0.20	6
EMP89A	75-85	14.5	11.5	4.80 ± 0.20	6
EMP92A	75-85	15.0	12.0	5.00 ± 0.20	5
ETL85A	75-85	12.5	10.0	4.20 ± 0.20	10
ETL91A	75-85	15.0	12.0	5.00 ± 0.20	6
ETL94A	75-85	19.0	15.0	6.25 ± 0.25	5
ETL69D	55-65	23.0	18.5	8.05 ± 0.25	3
RN3038	75-85	9.5	7.8	3.20 ± 0.25	3
RN3039	75-85	12.3	10.0	4.30 ± 0.10	4
RN3050	75-85	15.5	12.4	5.10 ± 0.25	2
RN70A	75-85	7.9	6.4	2.50 ± 0.25	12
RN83A	75-85	9.7	7.8	3.20 ± 0.15	8
RN90A	75-85	13.7	11.0	4.55 ± 0.15	4
ECP61A	75-85	11.3	9.0	3.75 ± 0.20	19
ECP72A	70-80	10.0	8.0	3.30 ± 0.20	15
ECP83A	75-85	11.5	9.2	3.65 ± 0.25	10
ECP90A	75-85	14.8	11.9	4.90 ± 0.20	5
ECP93A	75-85	15.7	12.6	5.20 ± 0.20	7
ECP95A	75-85	17.5	14.1	5.80 ± 0.20	4
ECP57D	60-70	21.8	17.4	7.20 ± 0.20	3

Polyether (PTMEG) TDI Prepolymers

	High Performance								Ultra High Performance			
ERAPOL PREPOLYMER	**E77A**	**E83A**	**E90A**	**E93A**	**E95A**	**ET83A**	**ET90A**	**ET95A**	**EHP85A**	**EHP90A**	**EHP93A**	**EHP95A**
PREPOLYMER PROPERTIES												
%NCO	2.4 ± 0.20	3.10 ± 0.20	4.20 ± 0.20	5.00 ± 0.20	6.25 ± 0.25	3.10 ± 0.20	4.20 ± 0.20	6.25 ± 0.25	3.50 ± 0.20	4.60 ± 0.20	5.20 ± 0.20	5.80 ± 0.20
Specific Gravity at 25°C	1.08	1.05	1.06	1.05	1.07	1.05	1.06	1.06	1.06	1.06	1.05	1.10
Viscosity at 80°C	1800 – 3000	1000 – 1500	800 – 1300	500 – 900	300 – 700	1300 – 1800	900 – 1300	300 – 700	900 – 1600	300 – 900	500 – 900	400 – 800
Colour	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber
MOCA PROCESSING												
Moca Level at 110 -120°C (pph)	7.3	10.0	12.5	15.0	19.0	10.0	12.5	19.0	11.1	14.0	15.7	17.5
Recommended % Theory	95	100	95	95	95	100	95	95	100	95	95	95
Erapol Temperature (°C)	80 – 90	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85	70 – 80	75 – 85	75 – 85	75 – 85
Pot Life / Prepolymer at 80°C (minutes)	25	15	10	8	6	8	6	4	17	8	8	5
Demould at 100°C (hours)	2	1	1	1	1	1	<1	<1	2	1	1	<1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16	16	16	16
ETHACURE 300 PROCESSING												
Ethacure 300 Level at 20 – 30°C (pph)	6.1	8.0	10.2	12.0	15.0	8.0	10.0	15.0	8.9	11.1	12.6	14.1
Recommended % Theory	100	100	95	95	95	100	95	95	100	95	95	95
Erapol Temperature (°C)	80 – 90	65 – 75	65 – 75	65 – 75	65 – 75	65 – 75	65 – 75	65 – 75	70 – 80	65 – 75	65 – 75	65 – 75
Pot Life / Prepolymer at 70°C (minutes)	11	12	10	8	4	6	3	2	14	7	7	5
Demould at 100°C (hours)	2	1	1	1	1	1	<1	<1	2	2	1	<1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES (based on MOCA curative)												
Hardness (Shore A)	79 ± 3	83 ± 3	90 ± 3	93 ± 3	95 ± 3	83 ± 3	90 ± 3	95 ± 3	83 ± 2	90 ± 3	93 ± 3	95 ± 3
Tensile Strength / MPa (psi)	30.0 (4351)	33.0 (4786)	42.0 (6092)	43.0 (6237)	45.0 (6527)	33.1 (4801)	33.0 (4786)	42.7 (6193)	38.0 (5500)	40.0 (5802)	43.7 (6338)	44.1 (6396)
100% Modulus / MPa (psi)	4.8 (696)	4.6 (667)	9.3 (1349)	11.0 (1595)	13.1 (1900)	4.8 (696)	6.9 (1001)	6.9 (1001)	7.3 (1060)	7.2 (1044)	9.8 (1421)	13.8 (2002)
300% Modulus / MPa (psi)	6.9 (1000)	8.3 (1204)	17.8 (2582)	17.9 (2596)	18.8 (2727)	8.3 (1204)	13.8 (2002)	12.4 (1798)	13.1 (1900)	15.1 (2190)	18.2 (2640)	18.2 (2640)
Angle Tear Strength, Die C (kN/m)	59	72	85	100	90	75	85	85	72	104	118	122
Elongation (%)	600	550	420	420	390	500	450	380	565	500	500	410
DIN Abrasion Resistance (mm^3)	42	35	55	60	70	45	55	75	30	37	41	51
Compression Set / 22 hr at 70°C (%)	34	28	30	28	35	30	35	38	26	24	25	27
Cured Specific Gravity (g/cm^3)	1.06	1.08	1.10	1.10	1.13	1.08	1.11	1.08	1.07	1.10	1.10	1.13

*The information presented here is based on laboratory testing.

Polyether (PTMEG) TDI Prepolymers – Shore D

	High Performance									Ultra High	
ERAPOL PREPOLYMER	**ETX65D**	**ETX70D**	**ETX764D**	**ETX80D**	**ETX85D**	**ET60D**	**ET65D**	**ET70D**	**ET75D**	**EHP60D**	**EHP70D**
PREPOLYMER PROPERTIES											
%NCO	8.00 ± 0.20	8.75 ± 0.25	8.75 ± 0.25	9.50 ± 0.30	12.00 ± 0.30	7.40 ± 0.20	8.00 ± 0.25	9.20 ± 0.20	11.20 ± 0.25	7.50 ± 0.25	9.00 ± 0.25
Specific Gravity at 25°C	1.10	1.10	1.10	1.10	1.15	1.06	1.11	1.13	1.11	1.10	1.11
Viscosity at 80°C	400 – 800	200 – 500	400 – 800	300 – 800	300 – 800	300 – 700	300 – 700	300 – 700	300 – 700	400 – 800	400 – 800
Colour	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber
MOCA PROCESSING											
Moca Level at 110 -120°C (pph)	23.0	25.0	25.0	26.0	33.0	21.0	22.0	25.0	30.5	22.7	27.2
Recommended % Theory	90	90	90	85	85	90	85	85	85	95	95
Erapol Temperature (°C)	60 – 65	60 – 65	60 – 65	60 – 65	60 – 65	60 – 65	60 – 65	60 – 65	60 – 65	60 – 70	60 – 70
Pot Life / Prepolymer at 65°C (minutes)	4	3	2.5	2.5	2.5	3	2	1	<1	3	2
Demould at 110°C (hours)	<1	<1	<1	<1	<1	1	1	<1	<1	<1	<1
Post Cure at 110°C (hours)	24	36	36	36	36	16	16	16	16	16	16
ETHACURE 300 PROCESSING											
Ethacure 300 Level at 20 – 30°C (pph)	18.4	20.0	20.0	21.0	27.0	17.0	17.5	20.0	24.5	18.2	22.0
Recommended % Theory	90	90	90	85	85	90	85	85	85	95	95
Erapol Temperature (°C)	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65	55 – 65
Pot Life / Prepolymer at 80°C (minutes)	3	2	2	3	3	2	2	1	<1	4	2
Demould at 110°C (hours)	1	<1	<1	<1	<1	1	1	1	1	<1	<1
Post Cure at 110°C (hours)	24	36	36	36	36	16	16	16	16	16	16
PHYSICAL PROPERTIES (based on MOCA curative)											
Hardness (Shore D)	65 ± 5	70 ± 5	75 ± 5	78 ± 5	84 ± 5	60 ± 3	65 ± 3	73 ± 3	75 ± 3	60 ± 3	70 ± 3
Tensile Strength / MPa (psi)	48.0 (6962)	50.0 (7251)	52.0 (7542)	55.0 (7977)	58.0 (8412)	43.0 (6240)	48.0 (6962)	52.0 (7542)	54.0 (7832)	49.2 (7140)	50.0 (7252)
100% Modulus / MPa (psi)	27.0 (3916)	32.0 (4641)	33.0 (4786)	38.0 (5511)	42.0 (6092)	19.3 (2799)	29.0 (4206)	34.5 (5004)	31.0 (4496)	24.1 (3500)	25.0 (3626)
300% Modulus / MPa (psi)	48.0 (6962)	-	-	-	-	42.7 (6193)	-	-	-	45.5 (6600)	-
Angle Tear Strength, Die C (kN/m)	310	235	200	170	265	120	115	193	110	168	192
Elongation (%)	300	225	160	220	220	330	280	210	200	400	245
DIN Abrasion Resistance (mm^3)	80	85	87	125	123	62	110	105	115	68	68
Cured Specific Gravity (g/cm^3)	1.13	1.13	1.19	1.13	1.13	1.16	1.13	1.13	1.20	1.16	1.15

*The information presented here is based on laboratory testing.

Polyether (PPG) and (PTMEG/PPG) TDI Prepolymers

	PPG					Medium Performance			
ERAPOL PREPOLYMER	**ETL65A**	**ETL85A**	**ETL91A**	**ETL94A**	**ETL69D**	**EMP83A**	**EMP89A**	**EMP92A**	**EMP95A**
PREPOLYMER PROPERTIES									
%NCO	2.85 ± 0.25	4.20 ± 0.20	5.00 ± 0.20	6.25 ± 0.25	8.05 ± 0.25	3.2 ± 0.20	4.8 ± 0.20	5.0 ± 0.20	6.3 ± 0.20
Specific Gravity at 25°C	1.10	1.02	1.03	1.02	1.10	1.02	1.02	1.02	1.02
Viscosity at 80°C	100 – 500	300 – 700	100 – 500	150 – 500	300 – 800	300 – 800	300 – 800	300 – 700	300 – 700
Colour	amber	amber	amber	amber	amber	amber	amber	amber	amber
MOCA PROCESSING									
Moca Level at 110 -120°C (pph)	8.6	12.5	15.0	19.0	23.0	10.0	14.5	15.0	19.0
Recommended % Theory	95	95	95	95	85	95	95	95	95
Erapol Temperature (°C)	75 – 85	75 – 85	75 – 85	75 – 85	55 – 65	75 – 85	75 – 85	75 – 85	75 – 85
Pot Life / Prepolymer at 80°C (minutes)	25	10	6	5	3	6	6	5	3
Demould at 100°C (hours)	2	2	1	1	1	1	1	1	1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16
ETHACURE 300 PROCESSING									
Ethacure 300 Level at 20 – 30°C (pph)	6.9	10.0	12.0	15.0	18.5	8.0	11.5	12.0	15.3
Recommended % Theory	95	95	95	95	90	100	95	95	95
Erapol Temperature (°C)	60 – 70	60 – 70	60 – 70	60 – 70	55 – 65	65 – 75	65 – 75	65 – 75	65 – 75
Pot Life / Prepolymer at 80°C (minutes)	20	8	5	4	2	6	5	5	3
Demould at 100°C (hours)	2	2	1	1	1	1	1	1	1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES (based on MOCA curative)									
Hardness (Shore A)	65 ± 3	85 ± 3	90 ± 3	95 ± 3	70D ± 3	83 ± 3	90 ± 3	93 ± 3	95 ± 3
Tensile Strength / MPa (psi)	8.0 (1160)	28 (4061)	25.5 (3698)	28.0 (4061)	37.0 (5366)	25.0 (3626)	27.0 (3916)	31.0 (4496)	37.9 (5497)
100% Modulus / MPa (psi)	2.1 (305)	5.3 (769)	6.2 (899)	6.2 (899)	13.8 (2002)	5.0 (725)	6.9 (1001)	9.0 (1305)	9.7 (1407)
300% Modulus / MPa (psi)	4.4 (638)	11.0 (1595)	11.7 (1697)	17.2 (2495)	37.0 (5366)	9.0 (1305)	12.4 (1798)	17.2 (2495)	17.9 (2596)
Angle Tear Strength, Die C (kN/m)	30	70	80	89	110	75	80	90	95
Elongation (%)	1100	525	430	350	300	450	400	540	400
DIN Abrasion Resistance (mm^3)	165	140	140	145	160	80	80	85	97
Compression Set / 22 hr at 70°C (%)	45	45	45	50	50	30	45	45	42
Cured Specific Gravity (g/cm^3)	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10

*The information presented here is based on laboratory testing.

Polyether (PTMEG) Lower Free TDI Prepolymers

	High Performance								
ERAPOL PREPOLYMER	**L-E83A**	**L-E90A**	**L-E93A**	**L-E95A**	**L-EHP90A**	**L-E60D**	**L-E65D**	**L-ETX75D**	**L-ETX80D**
PREPOLYMER PROPERTIES									
%NCO	3.10 ± 0.20	4.20± 0.20	5.00 ± 0.20	6.00 ± 0.25	4.60 ± 0.20	7.40 ± 0.20	8.30 ± 0.20	9.20 ± 0.20	9.50 ± 0.30
Specific Gravity at 25°C	1.05	1.06	1.05	1.07	1.06	1.06	1.11	1.10	1.10
Viscosity at 80°C	1000 – 1500	800 – 1300	500 – 900	300 – 700	300 – 900	300 – 700	300 – 700	500 – 700	300 – 800
Colour	light amber	light amber	light amber	light amber	light amber	light amber	light amber	light amber	ight amber
MOCA PROCESSING									
Moca Level at 110 -120°C (pph)	10.0	12.5	15.0	18.0	14.0	21.0	25.4	27.8	26.0
Recommended % Theory	100	95	95	95	95	90	95	95	85
Erapol Temperature (°C)	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85	60 – 65	60 – 65	60 - 70	60 – 65
Pot Life at 75 – 85°C (minutes)	15	10	8	8	12 - 14	5 - 6	4 - 6	3 - 5	5 - 7
Demould at 100°C (hours)	1	1	1	<1	0.5 - 0.75	1	0.5	20 - 25	<1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	24
ETHACURE 300 PROCESSING									
Ethacure 300 Level at 20 – 30°C (pph)	8.0	10.2	12.0	14.5	11.1	17	20.4	22.3	21.0
Recommended % Theory	100	95	95	95	95	90	95	95	85
Erapol Temperature (°C)	65 – 75	65 – 75	65 – 75	65 – 75	65 - 75	55 – 60	55 – 65	60 - 70	55 – 65
Pot Life at 65-75°C (minutes)	12	10	8	6	12	4 - 5	5-7	3 - 5	5 - 7
Demould at 100°C (hours)	1	1	1	<1	0.5 - 0.75	1	0.5	20 - 25	<1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	24
PHYSICAL PROPERTIES (MOCA CURED)									
Hardness (Shore A)	83 ± 3	90 ± 3	93 ± 3	95 ± 3	90 ± 3	60D ± 3	65D ± 3	75D ± 3	78D ± 3
Tensile Strength / MPa (psi)	33.0 (4786)	42.0 (6092)	43.0 (6237)	36.0 (5221)	38.4 (5569)	45 (6527)	54 (7832)	50.1 (7266)	63 (9094)
100% Modulus / MPa (psi)	4.6 (667)	9.3 (1349)	11.0 (1595)	12.5(1813)	8.1 (1175)	19.9 (2886)	25(3626)	42.5 (6164)	47 (6817)
300% Modulus / MPa (psi)	8.3 (1204)	17.8 (2582)	17.9 (2596)	20.4 (2959)	14.6 (2118)	45 (6527)	-	-	-
Angle Tear Strength, Die C (kN/m)	72	85	100	112	88	110	139	140	-
Trouser Tear Strength (kN/m)	27	37	60	59	35	46	58	52	-
Elongation (%)	550	420	420	490	615	300	350	195	210
DIN Resilience (%)	62	55	50	42	47	46	46	40	38
DIN Abrasion Resistance 10N (mm^3)	35	55	60	54	48	63	69	106	94
DIN Abrasion Resistance 5N (mm^3)	12	18	22	19	-	-	-	-	-
Compression Set / 22hr at 70 °C (%)	28	30	28	37	-	-	-	-	-

*The information presented here is based on laboratory testing.

Polyether (PPG) & Polyester Lower Free TDI Prepolymers

	Polyether				Polyester				
ERAPOL PREPOLYMER	**L-ETL85A**	**L-ETL91A**	**L-ETL94A**	**L-ETL69D**	**L-RN70A**	**L-RN71A**	**L-RN85A**	**L-RN92A**	**L-RN50A**
PREPOLYMER PROPERTIES									
%NCO	4.20 ± 0.20	5.00 ± 0.20	6.25 ± 0.25	8.00± 0.20	2.55 ± 0.20	2.55 ± 0.20	3.50 ± 0.20	4.50 ± 0.20	5.10 ± 0.20
Specific Gravity at 25°C	1.02	1.03	1.02	1.10	1.20	1.20	1.20	1.20	1.20
Viscosity at 80°C	300 – 700	100 – 500	150 – 500	400 – 800	1700 – 2500	1700 – 2500	2600 – 2800	1600 – 2100	1200 – 1800
Colour	amber	amber	amber	amber	light amber	light amber	light amber	light amber	light amber
MOCA PROCESSING									
Moca Level at 110 -120°C (pph)	12.5	15.0	19.0	22.9	7.9	8.3	10.6	13.6	15.4
Recommended % Theory	95	95	95	90	95	102	95	95	95
Erapol Temperature (°C)	75 – 85	75 – 85	75 – 85	55 – 65	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85
Pot Life at 75 – 85°C (minutes)	10	6	4 – 6	3 - 6	12	4 - 6	6 - 10	3 - 5	4.5 - 6
Demould at 100°C (hours)	2	1	1	1	1	0.75	0.5	0.5	1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16
ETHACURE 300 PROCESSING									
Ethacure 300 Level at 20 – 30°C (pph)	10.0	12.0	15.0	18.4	6.4	6.6	8.5	10.9	12.4
Recommended % Theory	95	95	95	90	95	102	95	95	95
Erapol Temperature (°C)	60 – 70	60 – 70	60 – 70	55 – 65	65	65	65	65	65
Pot Life at 65-75°C (minutes)	8	5	4 – 6	3 - 6	9	4 - 6	6 - 8	3 - 5	4.5 - 6
Demould at 100°C (hours)	2	1	1	1	1	0.75	0.5	0.5	1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES (MOCA CURED)									
Hardness (Shore A)	85 ± 3	90 ± 3	95 ± 3	70D ± 3	70 ± 3	70 ± 3	85 ± 3	90 ± 3	50D ± 3
Tensile Strength / MPa (psi)	28.0 (4061)	25.5 (3698)	34 (4931)	43 (6237)	40 (5801)	32 (4641)	42 (6150)	52 (7542)	57.7 (8369)
100% Modulus / MPa (psi)	5.3 (769)	6.2 (899)	11.2 (1624)	29 (4206)	2.8 (406)	2.2(319)	5.9 (856)	7.2 (1044)	10.5 (1523)
300% Modulus / MPa (psi)	11.0 (1595)	11.7 (1697)	21.8 (3162)	-	3.9 (565)	3.1 (450)	11.0 (1595)	17.4 (2524)	20.7 (3002)
Angle Tear Strength, Die C (kN/m)	70	80	89	145	70	68	88	97	121
Trouser Tear Strength (kN/m)	30	-	39	-	35	33	41	47	57
Elongation (%)	525	430	460	275	675	560	750	575	620
DIN Resilience (%)	-	-	32	46	42	42	26	27	27
DIN Abrasion Resistance 10N (mm^3)	140	140	119	182	70	75	57	57	60
DIN Abrasion Resistance 5N (mm^3)	49	45	43	-	33	35	-	27	-
Compression Set / 22hr at 70 °C (%)	45	45	-	-	28	-	-	-	-

*The information presented here is based on laboratory testing.

Polyester TDI Prepolymers

	High Performance						
ERAPOL PREPOLYMER	**RN70A**	**RN83A**	**RN90A**	**RN50D**	**RN3038**	**RN3039**	**RN3050**
PREPOLYMER PROPERTIES							
%NCO	2.50 ± 0.25	3.20 ± 0.15	4.55 ± 0.15	5.10 ± 0.20	3.20 ± 0.25	4.30 ± 0.10	5.10 ± 0.25
Specific Gravity at 25°C	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Viscosity at 80°C	1700 – 2500	1700 – 2300	1200 – 1800	1200 – 1800	1800 – 2400	1600 – 2500	1300 – 1900
Colour	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber
MOCA PROCESSING							
Moca Level at 110 -120°C (pph)	7.9	9.7	13.7	15.4	9.5	12.3	15.5
Recommended % Theory	95	95	95	95	95	90	95
Erapol Temperature (°C)	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85	75 – 85
Pot Life / Prepolymer at 80°C (minutes)	12	8	4	2	3	4	2
Demould at 100°C (hours)	1	1	1	< 1	1	1	< 1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16
ETHACURE 300 PROCESSING							
Ethacure 300 Level at 20 – 30°C (pph)	6.4	7.8	11.0	12.4	7.8	10.0	12.4
Recommended % Theory	95	95	95	95	95	90	95
Erapol Temperature (°C)	65	65	65	65	65	65	65
Pot Life / Prepolymer at 80°C (minutes)	9	6	4	2	3	4	2
Demould at 100°C (hours)	1	1	1	> 1	1	1	> 1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16
PHYSICAL PROPERTIES (based on MOCA curative)							
Hardness (Shore A)	70 ± 5	83 ± 3	90 ± 3	50 ± 3 Shore D	85 ± 3	90 ± 5	50 ± 5 Shore D
Tensile Strength / MPa (psi)	40.0 (5802)	47.0 (6817)	53.0 (7687)	54.1 (7847)	45.0 (6527)	50.0 (7252)	51.0 (7397)
100% Modulus / MPa (psi)	2.8 (406)	4.9 (711)	5.2 (754)	9.2 (1334)	5.0 (725)	9.5 (1378)	12.4 (1798)
300% Modulus / MPa (psi)	3.9 (566)	8.3 (1204)	10.3 (1494)	17.4 (2524)	11.0 (1595)	17.9 (2596)	20.7 (3002)
Angle Tear Strength, Die C (kN/m)	70	75	100	124	92	105	131
Elongation (%)	675	725	650	550	720	650	550
DIN Abrasion Resistance (mm^3)	70	65	60	70	68	45	80
Compression Set / 22 hr at 70°C (%)	28	25	30	30	22	31	27
Cured Specific Gravity (g/cm^3)	1.25	1.26	1.26	1.28	1.25	1.27	1.28

*The information presented here is based on laboratory testing.

Caprolactone TDI Prepolymers

	Polycaprolactone							High Temperature		
ERAPOL PREPOLYMER	**ECP61A**	**ECP72A**	**ECP83A**	**ECP90A**	**ECP93A**	**ECP95A**	**ECP57D**	**HTE80A**	**HTE90A**	**HTE95A**
PREPOLYMER PROPERTIES										
%NCO	3.75 ± 0.20	3.30 ± 0.20	3.65 ± 0.25	4.90 ± 0.20	5.20 ± 0.20	5.80 ± 0.20	7.20 ± 0.20	3.40 ± 0.25	4.25 ± 0.25	5.25 ± 0.25
Specific Gravity at 25°C	1.15	1.10	1.10	1.11	1.10	1.10	1.11	1.11	1.10	1.11
Viscosity at 80°C	1000 – 1600	1200 – 2000	1000 – 1600	700 – 1200	700 – 1200	700 – 1100	300 – 800	1700 – 2300	1300 – 1700	1300 – 2000
Colour	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber
MOCA PROCESSING										
Moca Level at 110 -120°C (pph)	11.3	10.0	11.5	14.8	15.7	17.5	21.8	9.7	12.8	15.9
Recommended % Theory	95	95	95	95	95	95	95	95	95	95
Erapol Temperature (°C)	75 – 85	70 – 80	75 – 85	75 – 85	75 – 85	75 – 85	60 – 70	70 – 80	70 – 80	60 – 70
Pot Life / Prepolymer at 80°C (minutes)	19	15	10	5	7	4	3	17	6	2
Demould at 100°C (hours)	2	2	2	1	1	1	< 1	2	<1	<1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16	16
ETHACURE 300 PROCESSING										
Ethacure 300 Level at 20 – 30°C (pph)	9.0	8.0	9.2	11.9	12.6	14.1	17.4	7.8	10.1	12.7
Recommended % Theory	95	95	95	95	95	95	95	95	95	95
Erapol Temperature (°C)	75 – 85	70 – 80	65 – 75	65-75	65 – 75	65 – 75	60 – 70	70 – 80	70 – 80	60 – 70
Pot Life / Prepolymer at 80°C (minutes)	15	15	5	4	4	3	2	16	6	2
Demould at 100°C (hours)	2	2	2	1	1	1	< 1	2	1	<1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES (based on MOCA curative)										
Hardness (Shore A)	60 ± 5	71 ± 3	83 ± 3	90 ± 3	93 ± 3	95 ± 3	57 ± 3 Shore D	85 ± 3	90 ± 3	95 ± 3
Tensile Strength / MPa (psi)	35.0 (5076)	33.0 (4786)	36.0 (5221)	45 (6527)	42.0 (6092)	40.0 (5802)	43.0 (6237)	33.0 (4790)	40.0 (6530)	42.0 (6092)
100% Modulus / MPa (psi)	3.2 (464)	2.3 (334)	3.5 (508)	7.7 (1117)	6.8 (986)	7.2 (1044)	7.9 (1146)	6.2 (754)	5.4 (783)	7.3 (1059)
300% Modulus / MPa (psi)	8.0 (1160)	3.9 (566)	5.0 (725)	17.0 (2466)	10.9 (1581)	11.3 (1639)	-	7.6 (1100)	11.0 (1595)	10.7 (1552)
Angle Tear Strength, Die C (kN/m)	37	70	58	84.3	116	120	145	63	82	94
Elongation (%)	500	620	650	520	480	395	265	600	480	415
DIN Abrasion Resistance (mm^3)	71	50	45	53	66	70	70	50	65	54
Compression Set / 22 hr at 70°C (%)	10	15	24	31	32	32	35	25	28	32
Cured Specific Gravity (g/cm^3)	1.15	1.15	1.20	1.20	1.20	1.20	1.15	1.15	1.20	1.20

*The information presented here is based on laboratory testing.

Solvent & Acid Resistant Prepolymers

	Solvent Resistant					Acid Resistant			
ERAPOL PREPOLYMER	**SDR32A**	**SDR50A**	**SDR55A**	**RN3038**	**RN3039**	**CRE70A**	**CRE81A**	**CRE90A**	**CRE95A**
PREPOLYMER PROPERTIES									
%NCO	2.55 ± 0.20	3.90 – 0.20	4.80 ± 0.20	3.20 ± 0.20	4.30 ± 0.10	10.0 ± 0.2	10.0 ± 0.2	10.0 ± 0.2	12.0 ± 0.2
Specific Gravity at 25°C	1.20	1.02	1.20	1.20	1.20	1.05	1.05	1.05	1.05
Viscosity at 80°C	300 – 800	1500 – 2600	1000 – 1700	1800 – 2400	1600 – 2500	700 – 1300	700 – 1300	700 – 1300	700 – 1300
Colour	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	water clear	water clear	water clear	water clear
PROCESSING INFORMATION	ISONOL 93	ISONOL 93	ISONOL 93	ISONOL 93	ISONOL 93	PART B	PART B	PART B	BDO
Curative Level (pph)	5.4	8	10.3	6.7	8.8	41.6	32.5	10.4	12.2
Recommended % Theory	95	95	95	95	95	95	95	95	95
Erapol Temperature (°C)	70 – 80	70 – 80	70 – 80	70 – 80	70 – 80	65 – 70	65 – 70	75 – 80	75 – 80
Curative Temperature (°C)	25	25	25	25	25	25	25	25	25
Pot Life / Prepolymer at 80°C (minutes)	50 +	20 – 40	30 – 40	45	35	20 - 30 min at 70°C	20 - 30 min at 70°C	15 - 25	45 - 55
Demould at 100°C (hours)	8	–	8	5	5	1	1	1	1
Post Cure at 100°C (hours)	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES	ISONOL 93	ISONOL 93	ISONOL 93	ISONOL 93	ISONOL 93	PART B	PART B	PART B	BDO
Hardness (Shore A)	32 ± 3	50 ± 3	55 ± 3	52 ± 5	60 ± 5	70 ± 5	80 ± 5	90 ± 5	95 ± 5
Tensile Strength / MPa (psi)	1.6 (232)	3.0 (435)	5.0 (725)	25.0 (3626)	41.4 (6005)	15.0 (2176)	13.0 (1885)	18.0 (2611)	17 (2466)
100% Modulus / MPa (psi)	0.7 (102)	–	1.9 (276)	1.0 (145)	2.1 (305)	2.9 (421)	5 (725)	10.9 (1581)	10.6 (1537)
300% Modulus / MPa (psi)	1.0 (145)	–	3.4 (493)	2.0 (290)	4.8 (696)	6.3 (914)	11.3 (1639)	-	12.1 (1755)
Angle Tear Strength, Die C (kN/m)	17	26	14	25	31	31	39	60	65
Elongation (%)	420	185	340	540	475	490	325	290	370
Cured Specific Gravity (g/cm^3)	1.20	1.25	1.15	1.23	1.24	1.00	1.01	1.01	1.01

*The information presented here is based on laboratory testing.

Polyether (PTMEG) & Polyester MDI Prepolymers

	Polyether (PTMEG)					Polyester			
Erapol Prepolymer	**EMD85A**	**EMD90A**	**EMD93A**	**EMD96A**	**EMD52D**	**EME80A**	**EME85A**	**EMDE90A**	**EME95A**
PREPOLYMER PROPERTIES									
%NCO	6.50 ± 0.25	7.80 ± 0.25	8.80 ± 0.25	9.60 ± 0.25	10.60 ± 0.20	5.80 ± 0.20	6.40 ± 0.20	7.70± 0.20	9.00± 0.20
Specific Gravity at 25°C	1.05	1.05	1.05	1.05	1.05	1.13	1.13	1.13	1.13
Viscosity at 80°C	1200 – 2000	1000 – 1800	700 – 1500	400 – 1200	400 – 1200	1000 - 2000	1000 - 2000	950 - 1100	700 - 1000
Colour	white translucent	white translucent	white translucent	white translucent	white translucent	white translucent	white translucent	white translucent	white translucent
PROCESSING INFORMATION	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**
Curative Level (pph)	6.6	7.9	8.9	9.8	10.8	5.9	6.5	7.8	9.1
Recommended % Theory	95	95	95	95	95	95	95	95	95
Prepolymer Temperature (°C)	70 – 80	70 – 80	70 – 80	70 – 80	70 – 80	75 - 85	75 - 85	75 - 85	75 - 85
Curative Temperature (°C)	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 - 30	25 - 30	25 - 30	25 - 30
Pot Life (minutes)	9 – 12	4 – 6	3 – 4	3 – 4	2 – 3	10 - 15	8 - 12	5 - 6	4 - 7
Demould at 110°C (minutes)	60	60	50	45	45	120	120	25 - 35	15 - 20
Post Cure at 110°C (hours)	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**	**BDO**
Hardness (Shore A)	85 ± 3	90 ± 3	93 ± 3	96 ± 3	52D ± 3	80 ± 3	85± 3	90 ± 3	95 ± 3
Tensile Strength / MPa (psi)	35 (5076)	35 (5076)	35.0 (5076)	36 (5221)	36 (5221)	38 (5555)	48 (6962)	36 (5221)	31 (4496)
Angle Tear Strength, Die C (kN/m)	103	106	120	130	145	88	98	107	117
Trouser Tear Strength (kN/m)	30	30	37	40	45	51	58	65	62
Elongation (%)	600	520	510	490	450	625	610	550	465
DIN Resilience (%)	67	63	60	56	49	34	30	44	21
DIN Abrasion Resistance (mm^3)	45	48	51	40	45	57	39	33	43
Cured Specific Gravity (g/cm^3)	1.1	1.1	1.1	1.1	1.1	1.25	1.25	1.24	1.25

*The information presented here is based on laboratory testing.

Polyether MDI Quasi System – 4 Component

	High Performance							
	EMD135N/60A	**EMD135N/65A**	**EMD135N/70A**	**EMD135N/75A**	**EMD135N/80A**	**EMD135N/85A**	**EMD135N/90A**	**EMD135N/95A**
EMD 135N – ISOCYANATE PREPOLYMER								
Specific Gravity at 25°C	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Colour	clear	clear	clear	clear	clear	clear	clear	clear
EMD135N – POLYOL CURATIVE								
Specific Gravity at 25°C	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Colour	clear	clear	clear	clear	clear	clear	clear	clear
BDO								
Specific Gravity at 25°C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Colour	clear	clear	clear	clear	clear	clear	clear	clear
PROCESSING INFORMATION								
EMD135N – Isocyanate Level	100	100	100	100	100	100	100	100
EMD135N – Polyol / BDO Level	180 / 5.6	150 / 7.0	120 / 8.4	105 / 9.1	90 / 9.8	60 / 11.2	45 / 11.9	30 / 12.6
Eracat MF -Catalyst by weight (ppw)	1.3	1.2	0.7	0.6	0.4	0.3	0.3	0.2
Recommended % Theory	95	95	95	95	95	95	95	95
EMD135N – Isocyanate Temp (°C)	40	40	40	40	40	40	40	40
EMD135N – Polyol Temp (°C)	40	40	40	40	40	40	40	40
BDO Temp (°C)	25	25	25	25	25	25	25	25
Mould Temp (°C)	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100
Oven Temp (°C)	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100	90 – 100
Pot Life (minutes)	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8
Demould at 90 – 100°C (minutes)	60	45	45	45	30	30	30	30
Post Cure at 90 – 100°C (hours)	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES								
Hardness (Shore A)	60 ± 3	65 ± 3	70 ± 3	75 ± 3	80 ± 3	85 ± 3	90 ± 3	95 ± 3
Tensile Strength / MPa (psi)	21.0 (3046)	26 (3770)	28.0 (4061)	31.0 (4496)	32.0 (4641)	34.0 (4931)	36.0 (5221)	36.0 (5221)
100 % Modulus / MPa (psi)	1.5 (218)	2.3 (334)	3.0 (435)	4.0 (580)	5.3 (769)	7.2 (1044)	8.8 (1276)	11.0 (1595)
300 % Modulus / MPa (psi)	3.8 (551)	6.1 (885)	8.0 (1160)	9.8 (1421)	11.0 (1595)	13.8 (2002)	16.3 (2364)	18.3 (2654)
Angle Tear Strength, Die C (kN/m)	30	48	52	68	80	91	102	117
Trouser Tear Strength (kN/m)	16	19	24	25	45	47	57	69
Elongation (%)	620	615	585	578	590	608	587	550
DIN Resilience (%)	70	67	66	65	64	66	62	60
DIN Abrasion Resistance (mm^3)	30	21	23	21	30	34	36	44
Cured Specific Gravity (g/cm^3)	1.05	1.06	1.06	1.07	1.07	1.10	1.11	1.13

*The information presented here is based on laboratory testing.

Polyester MDI Quasi System – 4 Component

	High Performance								
	EME165N/55A	**EME165N/60A**	**EME165N/65A**	**EME165N/70A**	**EME165N/75A**	**EME165N/80A**	**EME165N/85A**	**EME165N/90A**	**EME165N/95A**
EME165N – ISOCYANATE PREPOLYMER									
Specific Gravity at 25°C	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
Colour	clear/amber	clear/amber	clear/amber	clear/amber	clear/amber	clear/amber	clear/amber	clear/amber	clear/amber
EME165N – POLYOL CURATIVE									
Specific Gravity at 25°C	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16	1.16
Colour	white	white	white	white	white	white	white	white	white
BDO									
Specific Gravity at 25°C	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Colour	clear	clear	clear	clear	clear	clear	clear	clear	clear
PROCESSING INFORMATION									
EME165N – Isocyanate Level	100	100	100	100	100	100	100	100	100
EME165N – Polyol / BDO Level	232 / 0	188.5/ 3.1	164.5 / 4.9	133.5 / 7.2	110.5 / 8.8	89 / 10.4	70 / 11.7	58.5 / 12.6	37.5 / 14.1
Eracat MF – Catalyst by Weight (ppw)	1.50	0.67	0.80	0.50	0.50	0.33	0.26	0.21	0.15
Recommended % Theory	95	95	95	95	95	95	95	95	95
EME165N – Isocyanate Temp (°C)	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50
EME165N – Polyol Temp (°C)	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50	45 – 50
BDO Temp (°C)	25 – 35	25 – 35	25 – 35	25 – 35	25 – 35	25 – 35	25 – 35	25 – 35	25 – 35
Mould Temp (°C)	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100
Oven Temp (°C)	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100	80 – 100
Pot Life (minutes)	5 – 8	5 – 8	5 – 8	5 – 8	5 – 8	4 – 7	4 – 7	3 – 5	3 – 5
Demould at 90 -100°C (minutes)	20 - 30	20 - 30	20 - 30	20 - 30	20 - 30	15 - 25	15 - 25	15 - 25	15 - 25
Post Cure at 90 -100°C (hours)	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES									
Hardness (Shore A)	55 ± 3	60 ± 3	65 ± 3	70 ± 3	75 ± 3	80 ± 3	85 ± 3	90 ± 3	95 ± 3
Tensile Strength / MPa (psi)	37 (5366)	37 (5366)	38 (5511)	44 (6382)	50 (7252)	41 (5946)	41 (5946)	36 (5221)	34 (4931)
100% Modulus / MPa (psi)	1.9 (276)	2.6 (377)	3.2 (464)	3.8 (551)	5.0 (725)	7.0 (1015)	9.0 (1305)	11.0 (1595)	14.8 (2147)
200% Modulus / MPa (psi)	3.9 (566)	6.4 (928)	7.5 (1088)	9.5 (1378)	11.8 (1711)	17.5 (2538)	20.5 (2973)	22.5 (3263)	25.9 (3756)
Angle Tear Strength, Die C (kN/m)	36.4	48.5	56.5	57.3	72.7	85.5	94.6	95.3	105.7
Trouser Tear Strength (kN/m)	13.5	13.6	19.2	18.1	30.5	31.5	28.9	35.2	42.4
Elongation (%)	690	650	630	500	580	500	500	450	400
DIN Resilience (%)	62	61	59	49	45	43	37	37	37
DIN Abrasion Resistance (mm^3)	44	36	36	34	34	41	39	53	69
Cured Density	1.19	1.20	1.20	1.21	1.21	1.22	1.23	1.23	1.23

*The information presented here is based on laboratory testing.

Cold Castable Polyether TDI Systems

	High Performance						Medium Performance					
	CC50A	**CC5/65A**	**CC80A**	**CC90A**	**CC95A**	**CC60D**	**CCM40A**	**CCM55A**	**CCM75A**	**CCM80A**	**CCM90A**	**CCM95A**
PART A – PROPERTIES												
Specific Gravity at 25°C	1.07	1.07	1.08	1.07	1.06	1.07	1.02	1.02	1.02	1.08	1.02	1.02
Colour	clear	clear	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber	clear, light amber
PART B – PROPERTIES												
Specific Gravity at 25°C	1.15	1.04	1.01	1.26	1.20	1.20	1.20	1.20	1.04	1.01	1.20	1.20
Colour	amber	amber	amber	amber	amber	amber	amber	amber	amber	amber	amber	amber
PROCESSING INFORMATION												
Mix Ratio by Weight (A/B)	100 / 100	100 / 100	100 / 45	100 / 50	100 / 15	100 / 16.5	100 / 80	100 / 56	100 / 45	100 / 35	100 / 20	100 / 15
Temperature of Part A (°C)	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30
Temperature of Part B (°C)	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30	25 – 30
Pot Life at 25°C (minutes)	10	12	15 – 18	15	6 – 10	6	15	30	15	12 – 15	8 – 10	7 – 8
Demould at 25°C (hours)	24	24	24	16	16	6 – 8	24	24	24	24	16	16
Accelerated Cure at 70°C (hours)	8	8	8	8	8	8	8	8	8	8	8	8
Complete Cure at 25°C (days)	7	7	7	7	7	7	7	7	7	7	7	7
PHYSICAL PROPERTIES												
Hardness (Shore A)	50 ± 5	60 ± 5	80 ± 3	90 ± 5	95 ± 3	60 ± 3 Sh D	40 ± 5	55 ± 5	73 ± 3	80 ± 3	90 ± 5	95 ± 5
Tensile Strength / MPa (psi)	15.0 (2176)	16.0 (2321)	28.0 (4061)	26.0 (3771)	44.0 (6382)	50.2 (7281)	18.0 (2611)	15.0 (2176)	20.0 (2901)	24.0 (3481)	20.3 (2944)	23.1 (3350)
Elongation (%)	650	600	510	500	380	250	580	550	450	500	370	320
DIN Abrasion Resistance (mm^3)	120	135	110	200	85	96	205	185	195	175	260	145
Linear Shrinkage at 23°C (%)	0.2	0.2	0.2	0.2	0.2	0.2	0.4	0.2	0.1	0.2	0.2	0.2
Cured Specific Gravity (g/cm^3)	1.10	1.10	1.10	1.10	1.12	1.10	1.10	1.10	1.10	1.10	1.10	1.10

*The information presented here is based on laboratory testing.

Cold Castable Polyether MDI Systems

	Flexible			Quick Cure				High Performance		
	EMD25ACC	**EMD35ACC**	**EMD45ACC**	**QCM40A**	**QCM60AS**	**QCM70A**	**QCM90AS**	**CMD78A**	**CMD90A**	**CMD93A**
PART A – PROPERTIES										
Specific Gravity at 25°C	1.13	1.13	1.13	1.15	1.12	1.16	1.16	1.13	1.13	1.13
Colour	pale amber	pale amber	pale amber	pale amber	pale amber	pale amber	pale amber	clear / hazy	white	clear / hazy
PART B – PROPERTIES										
Specific Gravity at 25°C	1.03	1.03	1.03	1.03	1.02	1.03	1.03	1.02	1.02	1.02
Colour	clear	clear	clear	clear	clear	clear	clear	white	white	white
PROCESSING INFORMATION										
Mix Ratio by Weight (A/B)	100 / 230	100 / 210	100 / 120	100 / 185	100 / 100	100 / 90	100 / 65	100 / 56	100 / 60	100 / 42
Temperature of Part A (°C)	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	25 – 35	25 – 35	25 – 35
Temperature of Part B (°C)	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	20 – 30	25 – 35	25 – 35	25 – 35
Pot Life (minutes)	15	15	23	7	15	7	10	10	5	7
Demould at 25°C (hours)	3 – 4	3 – 4	3 – 4	1	1	1	2	3	2	2
Accelerated Cure at 60°C (hours)	16	16	16	16	16	16	16	16	16	16
Complete Cure at 25°C (days)	7	7	7	7	7	7	7	7	7	7
PHYSICAL PROPERTIES										
Hardness (Shore A)	25 ± 5	35 ± 5	45 ± 5	40 ± 3	60 ± 3	70 ± 3	90 ± 5	80 ± 3	90 ± 3	93 ± 3
Tensile Strength / MPa (psi)	1.0 (145)	5.0 (725)	4.0 (580)	2.0 (290)	6.0 (870)	10.0 (1450)	32.0 (4641)	32.0 (4641)	24.0 (3481)	27.0 (3916)
Angle Tear Strength, Die C (kN/m)	5.0	7.0	7.0	8.0	32.0	41.0	75.0	65	117	137
Elongation (%)	1200	700	670	300	290	310	250	350	525	410
DIN Abrasion Resistance (mm^3)	-	-	-	-	67	55	58	35	57	48

*The information presented here is based on laboratory testing.

1K Blocked Series

	High Performance								
ERAPOL PREPOLYMER	**1K20A**	**1K30A**	**1K40A**	**1K50A**	**1K55A**	**1K60A**	**1K70A**	**1K80A**	**1K91A**
1K- PRODUCT SPECIFICATION									
Viscosity (cps)	1000 – 5000	4000	3900	2000 – 5000	2000 – 5000	4400	2000 – 6000	2900	2000
Colour	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber	Amber
Specific Gravity at 25°C	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20
PROCESSING INFORMATION									
1K – Melting / Processing Temp (°C)	50 – 75	50 – 75	50 – 75	50 – 75	50 – 75	50 – 75	50 – 75	50 – 75	50 – 75
1K – Mould Temp (°C)	130 – 140	130 – 140	130 – 140	130 – 140	130 – 140	130 – 140	130 – 140	130 – 140	130 – 140
Cure Time at 135 – 140 (°C) (hours)	16 – 18	16 – 18	16 – 18	16 – 18	16 – 18	16 – 18	16 – 18	16 – 18	16 – 18
Demould at 90 -100°C (hours)	16	16	16	16	16	16	16	16	16
PHYSICAL PROPERTIES									
Hardness (Shore A)	20 ± 5	32 ± 3	38 ± 3	50 ± 3	55 ± 3	60 ± 3	71 ± 3	80 ± 5	90 ± 3
Tensile Strength / MPa (psi)	2.6 (377)	2.0 (290)	7.6 (1102)	6.5 (943)	10 (1450)	14 (2031)	21 (3046)	18 (2611)	9 (1310)
100% Modulus / MPa (psi)	0.6 (87)	-	-	-	-	-	-	-	3.8
300% Modulus / MPa (psi)	1.4 (203)	-	-	-	-	-	-	-	5.1
Angle Tear Strength, Die C (kN/m)	13.9	7.8	12.6	18.3	21.2	32	48	53	44
Trouser Tear Strength (kN/m)	2	0.5	1	5.5	5.4	12	21	16	19
Elongation (%)	540	435	605	600	790	725	730	575	550
DIN Resilience (%)	23	34	29	33	32	29	42	40	23
Cured Specific Gravity	1.22	1.21	1.21	1.21	1.21	1.21	1.13	1.21	1.18
SOLVENT SWELL TEST (% WEIGHT INCREASE)									
Xylene	11.1	25	33	7.4	51	44	51	61	60
Cyclohecxane	0.21	37	41	0.01	54	62	68	80	80
Toluene	29.7	20	28	17.5	42	37	42	54	54
IPA	1.8	34	41	1.3	53	60	65	79	79
Dibasic	77.2	18	25	40.3	34	47	57	72	72
MEK	100.6	223	24	57.4	27	41	49	57	68

*The information presented here is based on laboratory testing.

Spray Systems

	Polyurethane									Polyurea		Aliphatic
	General Purpose MDI					High Performance MDI		High Performance TDI		High Performance MDI		
	Eraspray ESM700	Eraspray ESM800	Eraspray ESM900	Eraspray ESM955	Eraspray ES900PW ⊙	Eraspray ESP880	Eraspray ESP950	Eraspray ES81A-HB	Eraspray ES321	Eraspray ST	Eraspray ESM610D	Eraspray AL950
PART A – PROPERTIES												
Specific Gravity at 25°C	1.15	1.15	1.10	1.10	1.10	1.11	1.11	1.06	1.05	1.13	1.15	1.04
Colour	amber	amber	amber	amber	amber	amber	amber	amber	amber	amber	amber	water clear
PART B – PROPERTIES												
Specific Gravity at 25°C	1.01	1.04	1.02	1.02	1.02	1.02	1.01	0.96	1.02	1.0	1.08	0.99
Colour	amber brown	amber brown	amber brown	light amber brown	amber brown	dark brown	amber brown	amber	amber	amber	brown	hazy to milky
PROCESSING INFORMATION												
Mix Ratio by Weight (A/B/C)	-	-	-	-	-	-	-	100/60/1	-	-	-	-
Mix Ratio by Volume (A/B)	100/100	100/100	100/100	100/100	100/100	100/100	100/100	-	300/100	100/100	100/100	100/100
Temperature of Part A (°C)	40 – 50	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60	20 – 30	70 - 80	60 - 70	60 - 70	60 - 70
Temperature of Part B (°C)	40 – 50	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60	50 – 60	20 – 30	70 - 80	60 - 70	60 - 70	50 – 60
Pot Life at 25°C (minutes)	-	-	-	-	-	-	-	60	-	-		-
Pot Life at 40°C (seconds)	15	12	12	8	8 - 15	12 - 14	15	60 (min)	10	5	5	10 - 14
Complete Cure at 25°C (days)	6	6	6	5	6	5	5	7	5	5	5	6
PHYSICAL PROPERTIES												
Hardness (Shore A)	70	80	90	90	90	88	95	75	88	95	60D	95
Tensile Strength / MPa	7.2	7.0	14.0	16.5	13.9	27.0	23.0	11.0	35.0	17.0	22.0	20.1
Angle Tear Strength, Die C (kN/m)	33	25	42	61.4	42	71	64	45	80	75	78.5	101
Elongation (%)	260	260	190	185	190	320	350	280	380	175	160	320
DIN Abrasion Resistance (mm^3)	180	170	120	188	120	49	98	70	65	165	150 - 160	157
Cured Specific Gravity (g/cm^3)	1.02	0.9	1.02	1.057	1.02	1.004	0.96	0.95	0.98	1.033	1.033	1.01

*The information presented here is based on laboratory testing. ⊙ AS/NZS potable water approved.

Era Polymers Specialty Products

Era Divisions

Era Polymers has grown to offer more than 700 Polyurethane systems. We have diversified to include a number of divisions within the company. These six include:

Era Coatings | Era Elastomers | Era Foams | Era Machinery | Era Tolling | Era Trading

Cast Elastomers

2KE Blocked Series
Used for coating fibres impregnated with coarse carbide grains to produce tough flexible abrasive discs used for cleaning metal surfaces.

CRE Series
A range of high performance acid resistant elastomers.

Eratrowel Series
Two and three component cold cast trowellable systems.

QCM Series
MDI based elastomers with rapid demould times at room temperature.

GL Series
A water clear laminating polyurethane system used in security glass applications

HTE Series
High performance systems with excellent mechanical properties at high temperatures.

OC Series
Two component, optically clear systems. Cures at ambient or elevated temperatures.

SQH Series
MDI based systems with excellent solvent resistance, used for squeegee applications.

Erakote Systems
Erakote is a rapid reacting elastomer available in both two or three component systems. It has been designed to be applied as a poured material onto a rotating core to produce a tough elastomeric roller covering, suitable for material handling rollers.

SDR Series
High performance elastomer with outstanding oil and solvent resistance.

*** See product brochure for more details**

Era Polymers Specialty Products

Rubber Binders*

A range of single component, moisture cured polyurethane. Designed to bind reconstituted rubber for surfacing solutions.

Floor Coatings*

A range of Polyurethane Floor Coatings that are hard wearing, easy to maintain and will enhance the natural appearance of interior timber floors.

Foam Systems*

Our broad range of Rigid and Flexible polyurethane foam systems can be found in our ***Foam Brochure.***

Ancillary Products

Our polyurethane systems are complemented with a diverse range of ancillary products, they include release agents, adhesives, primers, pigments, solvents and additives.

Curatives

Standard Curatives:

These are common curatives used by processors all around the world. They include:

- ***MOCA***
- ***Ethacure 300***
- ***Isonol 93***
- ***1, 4 Butane Diol***

Blended Curatives:

These are specialty curatives only available from Era Polymers.
They have been developed in our laboratories for use with specific grades to achieve properties not available with the Standard Curatives.

- ***Eracure 105***
- ***Eracure 110***
- ***Eracure 112***
- ***Eracure 210***
- ***Eracure C32***
- ***Eracure C31***

*** See product brochure for more details**

Era Polymers Specialty Products

Spray Elastomers*

Eraspray ESM
General purpose MDI systems.

Eraspray ST / ESU
High performance Polyurea systems.

Eraspray ES900-PW / ST-PW
MDI potable water systems.

Eraspray ESP
High performance MDI systems.

Eraspray ES81AHB / ES321
High performance TDI systems.

Eraspray AL950
Aliphatic coating, 95 Shore A hardness with exceptional abrasion, UV and chemical resistance.

Agency Products

Whilst the range of Polyurethane Systems we manufacture is extensive, we expertly source a complimentary range of products from around the world to strengthen our product range. We also sell and service a range of equipment for the processing of Polyurethane Elastomers, Foams and Sprays, as well as equipment for Foam cutting and Elastomer Roll Grinding.

Stepan
Polyurethane Foams based on New Blowing Agents

Green Mountain International, LLC
Hydrophobic & Hydrophilic Polyurethane Water Stopping Grouts

POLYTEC EMC
Casting Equipment

FECKEN FK KiRFEL
Cutting Equipment

ICYNENE
Spray Foam Insulation

irathanefutura
Spray/Polyurethane/Polyurea Elastomers & Primers

GAMA
High Pressure Spray Equipment for Foams & Elastomers

GRACO
High Pressure Spray Equipment for Foams & Elastomers

Fomo Products, Inc.
1 & 2 Component Disposable Polyurethane Foam Systems

Perstorp
WINNING FORMULAS
CAPA Polycaprolactones for Superior Elastomers & Adhesives

cannon
High & Low Pressure Equipment for Foams

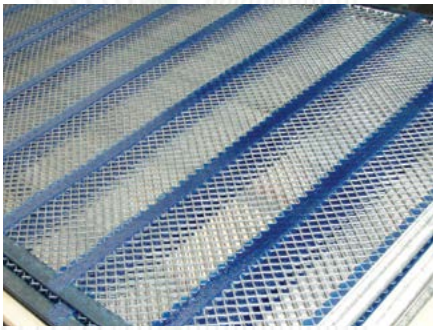
Vortex Mix
Dual Axis Centrifugal Mixers

ACMOS
Release Agents & Lubricants

CYTEC
Tooling/Prototyping Urethanes

FRICTION COATING
Grinding Products

DOW CORNING
Mould Making Silicone Rubber



*** See product brochure for more details**

The table below lists commonly experienced problems and their causes.

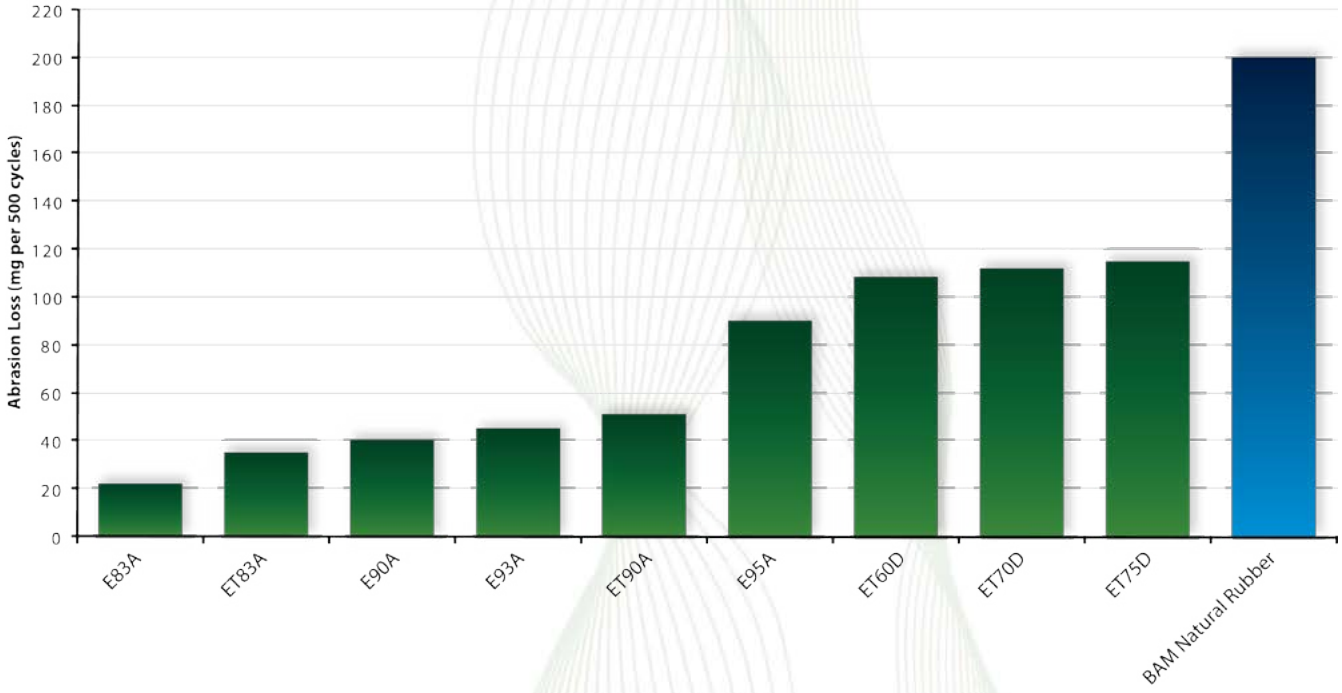
Problem	Possible Cause: Off Ratio	Poor Mix	High Exotherm	Incorrect Processing Temperature	Poor Vacuum	Nitrogen or Solvent	Leaks in Mixing Head	Dirty Moulds	Casting Technique	Loss of Prepolymer NCO	Insufficient Cure	Curative Contamination	Low Green Strength
Low Hardness	•	•								•	•		
Wet Spots	•	•											
Poor Tear	•	•								•	•		
Cheesy Appearance	•	•		•							•		•
High Shrinkage	•		•	•								•	
Air Bubbles					•	•	•	•	•			•	
Snow Flake Effect			•						•				
White Skin			•						•				
Voids in Part			•	•				•	•				
Short Pot Life	•			•								•	
Cracking	•	•	•	•					•				•
Foaming						•	•					•	
Striations		•											
Low Tensile Strength	•	•								•	•		

Approximate Viscosities of Common Materials
Material Viscosity in Centipoise

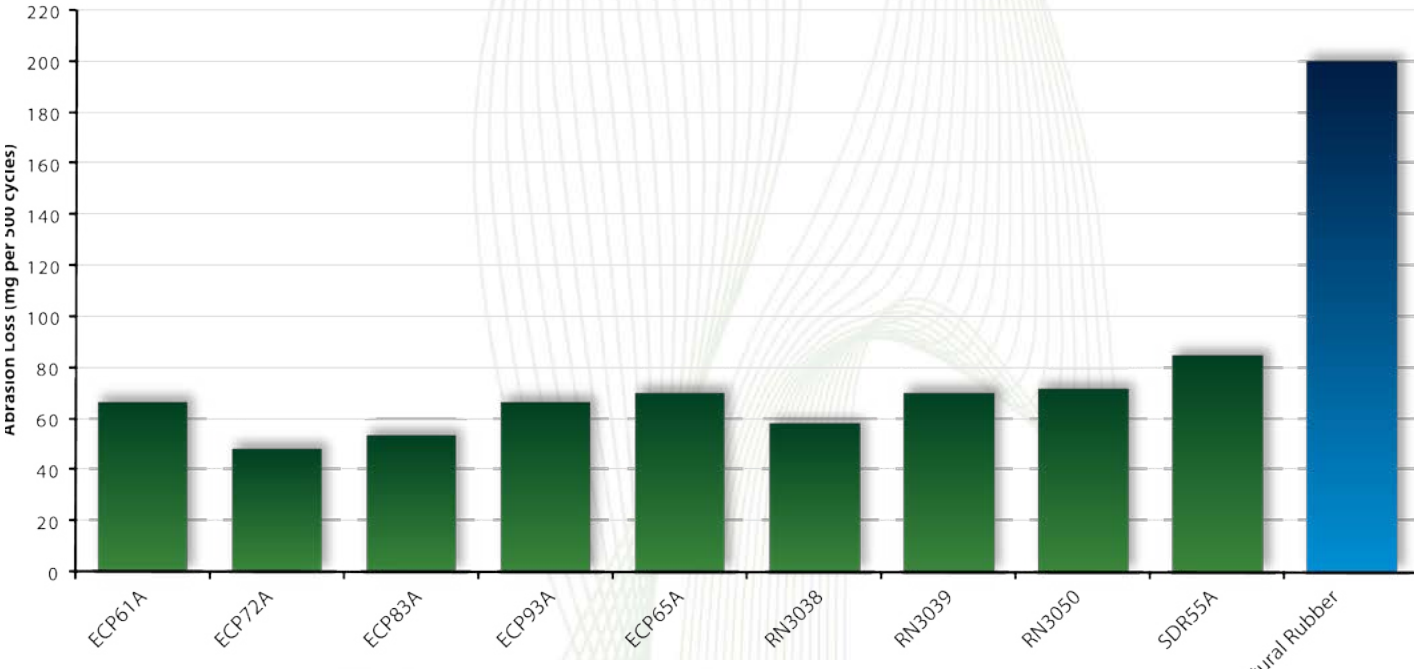
Water 1 cps	SAE 20 Motor Oil 140 – 420 cps	Castor Oil 1,000 cps	Chocolate Syrup 25,000 cps	Sour Cream 100,000 cps
Milk 3 cps	SAE 30 Motor Oil 420 – 650 cps	Karo Syrup 5,000 cps	Ketchup 50,000 cps	Peanut Butter 250,000 cps
SAE 10 Motor Oil 85 – 140 cps	SAE 40 Motor Oil 650 – 900 cps	Honey 10,000 cps	Mustard 70,000 cps	

Taber Abrasion Resistance Charts

Taber Abrasion Resistance – High Performance TDI Polyethers

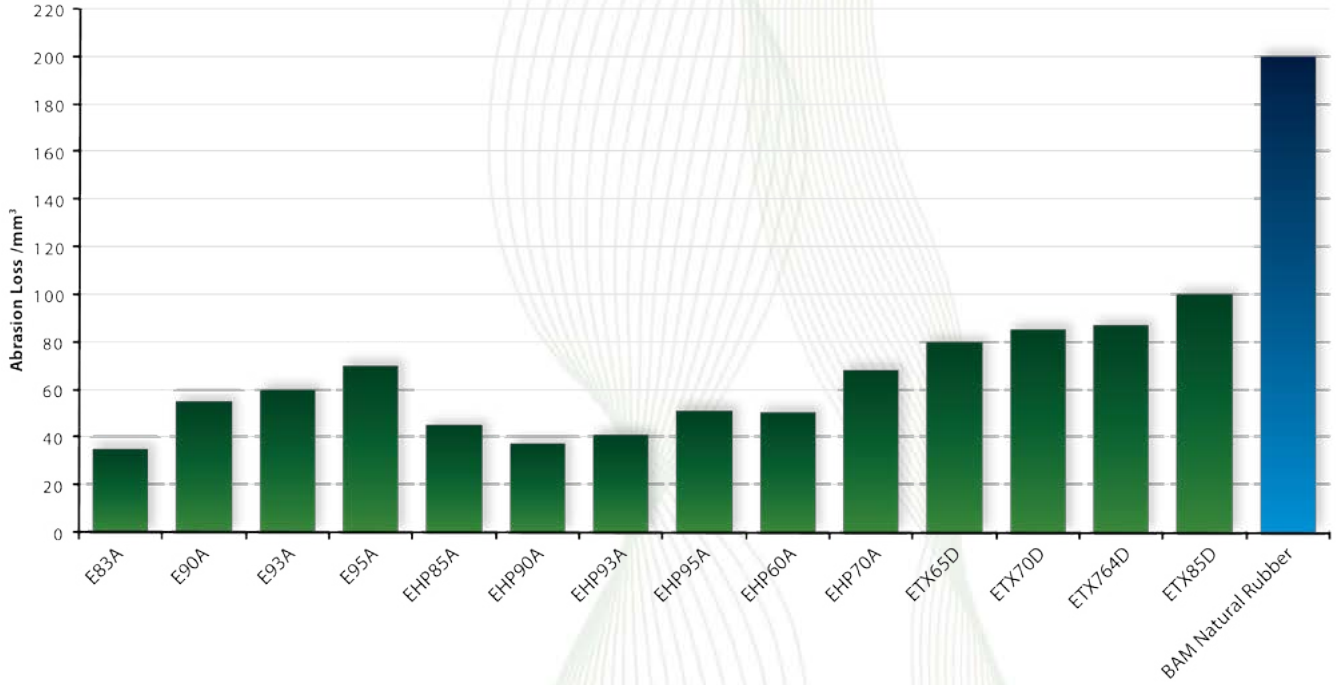


Taber Abrasion Resistance – High Performance TDI Polyesters / CAPA

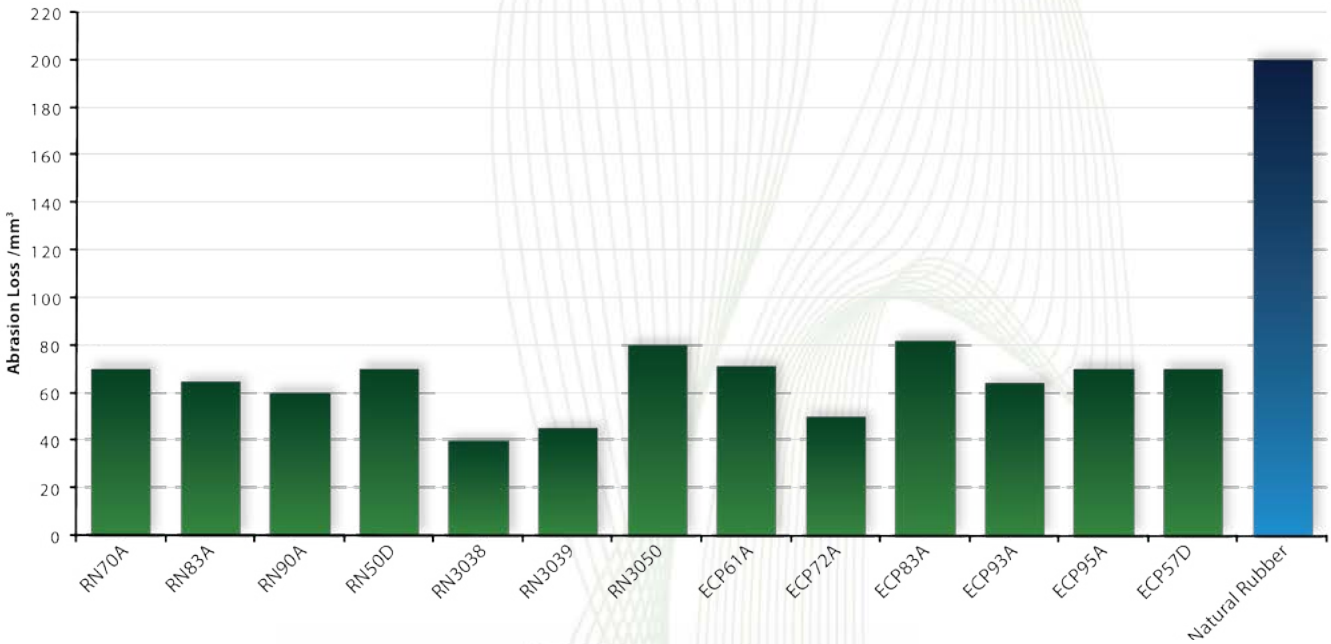


DIN Abrasion Resistance Charts

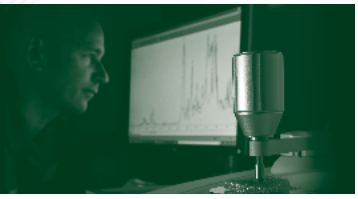
DIN Abrasion Resistance – High Performance TDI Polyethers



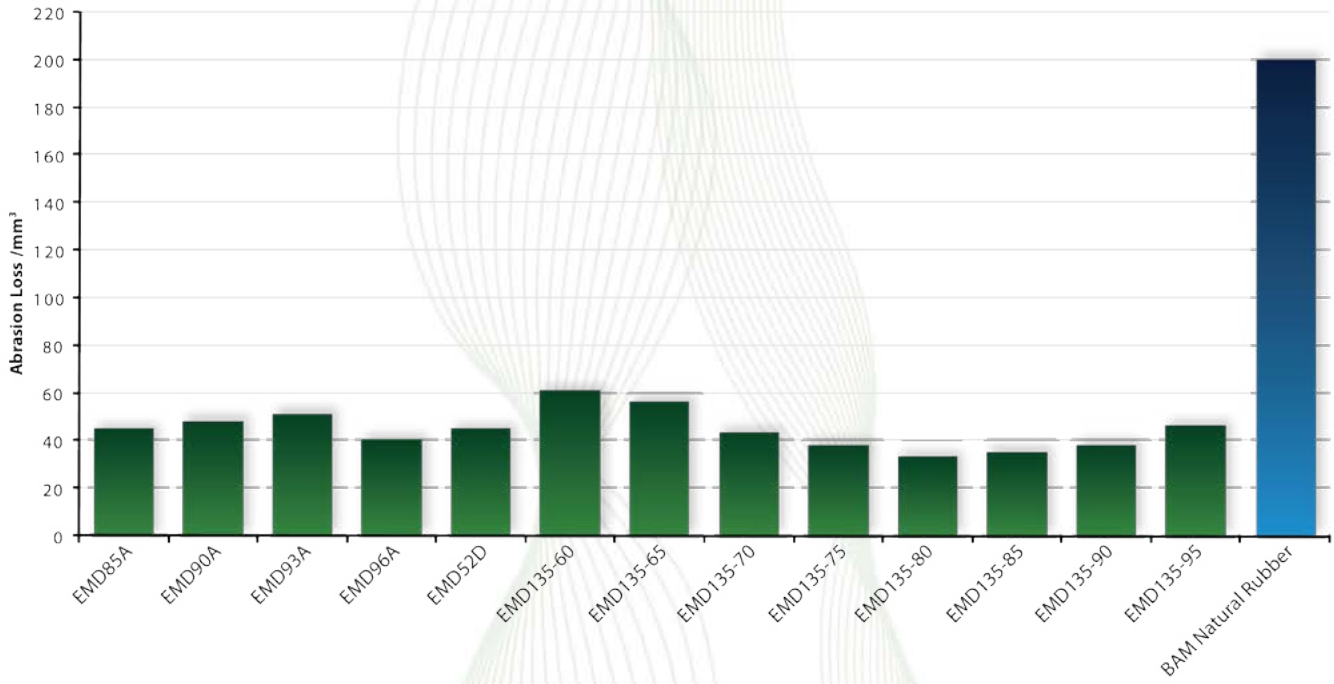
DIN Abrasion Resistance – High Performance TDI Polyesters



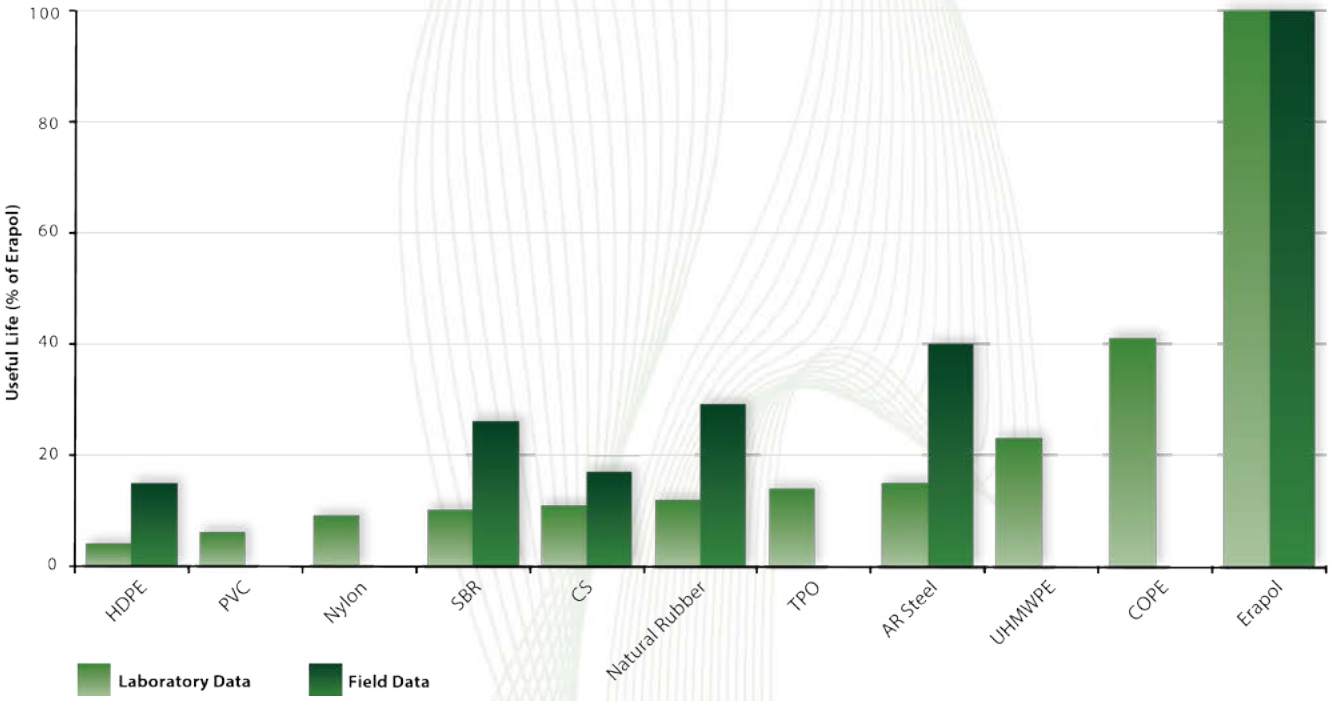
DIN Abrasion Resistance Charts



DIN Abrasion Resistance – High Performance MDI Polyethers



Abrasion Resistance Performance of Laboratory vs. Field Data for commonly used materials



Abbreviations: **HDPE** – High Density Polyethylene, **PVC** – Polyvinyl Chloride, **SBR** – Styrene Butadiene Rubber, **CS** – Carbon Steel, **TPO** – Thermoplastic Olefin, **AR Steel** – Abrasion Resistant, **UHMWPE** – Ultra High Molecular Weight Polyethylene, **COPE** – Copolyester/ether, ***Erapol*** – Polyurethane

Chemical Resistance

Erapols are chemically resistant to the following solvents, oils and chemicals. This is obviously only an abbreviated table. For more detailed information please contact our Technical Service Department.

The following ratings are used to describe the general performance of ***Erapols*** when immersed at ambient temperatures;

A. Recommended – little or no effect.

B. Minor to moderate effect.

C. Moderate to severe effect.

X. Not recommended.

Acetic acid	C	Cyclohexane	B	Oleic acid	B
Acetone	X	Ferric chloride	A	Olive oil	A
Ammonia hydroxide	A	FREON-12 (54°C)	A	Oxygen-cold	A
Ammonium nitrate	X	FREON-113	B	Ozone	A
Ammonium persulfate	X	Gasoline	A	Palmitic acid	A
Animal fats	A	Gelatin	A	Phosphoric acid (20%)	A
ASTM oil #1 (70°C)	A	Glucose	A	Phosphoric acid (45%)	A
ASTM reference fuel	A	Glue	A	Potassium chloride	A
Barium chloride	A	Glycerin	A	Potassium cupro cyanide	A
Barium hydroxide	A	Hydrochloric acid (cold) 37%	X	Potassium cyanide	A
Barium sulfate	A	Hydrochloric acid (hot) 37%	X	Potassium dichromate	A
Barium sulfide	A	Hydrofluoric acid conc. (cold)	X	Potassium nitrate	A
Borax	A	Hydrofluoric acid conc. (hot)	X	Potassium sulfate	A
Boric acid	A	Hydrogen gas	A	Producer gas	A
Butane	A	Isopropyl acetate	A	Radiation	A
Calcium bisulphite	A	Kerosene	B	Soap Solutions	A
Calcium chloride	A	Liquefied petroleum gas	A	Sodium chloride	A
Calcium hydroxide	A	Magnesium chloride	A	Sodium hydroxide (20%)	B
Calcium nitrate	A	Magnesium hydroxide	A	Sodium phosphate	A
Calcium sulfide	A	Mercury	A	Sodium sulfate	A
Carbon dioxide	A	Mineral oil	A	Sodium thiosulfate	A
Carbon monoxide	A	Natural gas	B	Stearic acid	A
Castor oil	A	Nickel sulfate	A	Sulphuric acid (dilute)	B
Citric acid	A	Nitric acid conc.	X	Sulphuric acid (conc)	X
Copper chloride	A	Nitric acid dilute	C	Sulphuric acid (20% oleum)	X
Copper cyanide	A	Nitric acid red fuming	X	Tannic acid (10%)	A
Copper sulphate	A	Nitrogen	A	Tartaric acid	A
Cottonseed oil	A	Octadecane	A	Toluene	C

Glossary of Terms

Additive – A material which does not take part in the chemical reaction but is included to alter the final product eg. fillers, pigments, flame retardants etc.

Casting – The filling of moulds with liquid polyurethane.

Catalyst – An ingredient in polyurethane systems which initiates a chemical reaction or increases the rate of chemical reaction.

Chain Reaction – Lengthening of the main chain or backbone of polymer molecules by end to end attachment.

Component – A separately metered stream of liquid which will be directly introduced into the mixing head.

Cross Linking – The formation of chemical links between the molecular chains.

Cure – Refers to the hardening or build-up of properties of a polymer material by cross-linking of polymer chains.

Curing Agent – Material that starts the reaction with the Prepolymer when added.

Cycle Time – A term most commonly used in situations where many items are being manufactured on an automatic or semi–automatic production line. It includes the time required for mould preparation, including release agent application, dispensing of components, reaction, cure and demould.

Degradation – The deterioration of a substance caused by contact with its environment.

Demould Time – The time between dispensing the liquid components into the mould and removing the article being produced.

Dew Point – The temperature at which a vapour begins to condense.

Elastomer – A flexible or semi-rigid rubber-like material not necessarily made from what is conventionally thought of as a rubber.

Elongation – The increase in length of a specimen at the instant before rupture occurs. Expressed as a percent of original length.

Exotherm – Heat generated by a chemical reaction.

Flame Retardant – A substance which is added to a polymer formulation to reduce or retard its tendency to burn.

Hardness – The surface property relating to the resistance of indentation.

Hydroxyl Group – The combined oxygen and hydrogen radical (–OH) which forms the reactive group in polyols.

Impact Resistance – Ability to withstand mechanical force without failure or loss of properties.

Isocyanate – The group of chemical compounds having one or more NCO groups attached to the main chain.

MDI – An abbreviation for diphenyl**M**ethane **D**i **I**socyanate.

Microcellular – An elastomer of cellular or foam structure.

Mil – One thousandth of an inch, 0.001 inch. A unit used to measure coating thickness.

Moulding – The process of producing a finished article from a closed mould.

NDI – **N**aphthalene **D**i **I**socyanate.

NCO – **N**itrogen, **C**arbon, **O**xygen. The chemical formula for an isocyanate group.

Polyester – Polymeric compound, with the reactive hydroxyl groups containing ester linkages.

Polyether – Polymeric compounds with reactive hydroxyl group containing ether linkages.

Polymer – A high molecular weight compound, natural or synthetic, whose chemical structure can be represented by a repeated small unit.

Polyol – A chemical compound with more than one reactive hydroxyl group attached to the molecule.

Post Cure – Refers to the period after casting, either in mould or after demoulding, before the material has developed full physical properties by cross linking of polymer chains.

Pot Life – The length of time after mixing together of the two components during which the polymer remains sufficiently liquid to be poured.

Prepolymer – A chemical intermediate manufactured by reacting raw isocyanate with polyol.

PTMEG – **P**oly **T**etra **M**ethylene **E**ther **G**lycol

PU – Abbreviation for Polyurethane

RIM – **R**eaction **I**njection **M**oulding. A process of injecting a fast reacting mixture of polyurethane into a mould.

System – A rather ambiguous term used to describe almost any combination of mechanical parts or chemicals which have some relationship to each other. Often used to describe the supply of all chemical components needed to produce a polyurethane.

TDI – An abbreviation for **T**oluene **D**i **I**socyanate.

Thermoset – A polymer that irreversibly cures from a liquid state to a solid state.

Thermoplastic – A polymer that turns to a liquid when heated and freezes to a solid state when cooled.

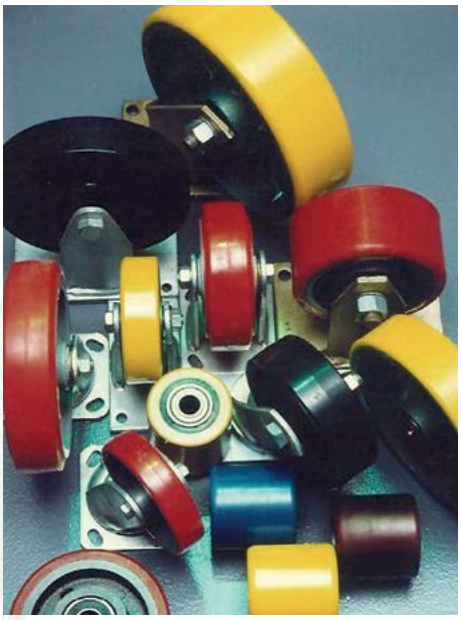
Thixotropic – A material that resists slumping or sagging when applied to a vertical surface.

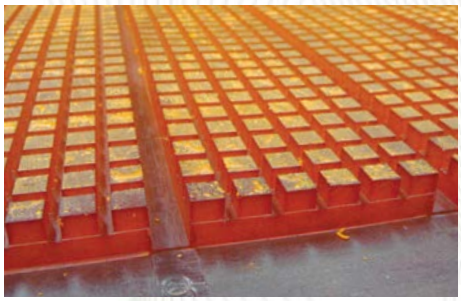
Viscosity – A measure of how easily a liquid flows. The lower the number the thinner the liquid.

Volatile Organic Components (VOC) – Organic materials which evaporate at normal temperatures and pressures, organic materials which have vapour pressure greater than 0.1 mm Hg at one atmosphere.












"Excellence in Polyurethane Chemistry"

Head Office
2-4 Green Street
Banksmeadow, Sydney
NSW 2019
Australia
P +61 2 9666 3788
F +61 2 9666 4805

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Goddess Hera

(H)**Era** in Greek religion, wife of Zeus, Queen of the Olympian Gods and patron Goddess of the Isle of Samos.

A father's passionate love of the island prompted his son to commemorate its history in the naming of our company.