

Polyurethane Specialty Products



“You can count on the Air Products team and our dependable polyurethane prepolymers and curatives to deliver the elastomer performance you need to meet your customers’ most challenging requirements and grow your business.”

Dr. Keith Welp, PSP Market Manager

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hen your customers count on you to produce top-quality parts, you can't afford to worry about the quality of your raw materials. You need a sense of security that your products will perform to your customers' expectations—security that comes from the support of a trusted supplier that strives to do whatever it takes to understand your unique application requirements, help you troubleshoot processing problems, and work with you to find the optimal solution to your customers' needs. That's why you need Air Products' Polyurethane Specialty Products (PSP) technical team and our dependable line of products.



Air Products supplies TDI-based polyester and polyether prepolymers under the names **Airthane®** and **Versathane®** polyurethane prepolymers. We also supply a variety of high-performance curatives and additives. Our materials are used by processors worldwide to produce molded polyurethane elastomers.

Polyurethane parts are conveniently made by mixing two components—a low molecular weight prepolymer that contains reactive isocyanate groups, and a curative that contains hydroxyl or amine groups. The mixture is poured into a heated mold where the components rapidly react to form a solid elastomeric part. In general, polyurethane elastomers have higher oil and solvent resistance and better aging properties than most general-purpose rubbers and plastics.

Polyurethanes also have greater abrasion and tear resistance than neoprene or natural rubber, coupled with greater load-bearing capacity than these materials. Compared with most other plastics, polyurethane elastomers exhibit greater extensibility and impact strength.

The Air Products polyurethane product line offers processors unique advantages over other products. Compared with conventional prepolymers, our Airthane and Versathane prepolymers offer:

- Superior consistency, drum-to-drum and lot-to-lot
- Superior thermal stability
- “Low-free” diisocyanates products ranging from less than 0.1% for Airthanes to 0.7% for Versathanes
- Superior consistency of finished parts after post-cure
- All products are FDA approved
- Versathane products offer superior processing latitude (they are more forgiving) than any other “low-free” TDI prepolymer on the market

We know it's not enough to simply supply products and services safely, on time, and within specification. That's just good business—we've been committed to quality, timeliness, and safety excellence for more than 60 years. It takes more than that for a supplier to stand out among the crowd, to be the best at delivering value to customers. It takes passion and commitment to building lasting relationships of mutual benefit.

This brochure outlines our Polyurethane Specialty Product (PSP) line of products. For more specific product information or to discuss your specific application, please call one of our technical representatives at 800-345-3148 or visit our Web site at www.airproducts.com/psp.

AIRTHANE® Prepolymers

TDI Prepolymers

- “Perfect” prepolymers
- <0.1% residual TDI
- OSHA and DOT nonhazardous
- Easy processing
- Low viscosity
- Long pot life
- Faster demold
- Superior dynamic performance in the final elastomer
- High load-bearing capability
- Improved high-temperature performance

Aliphatic Prepolymers

- IPDI-(Isophrone diisocyanate) based product for light-stable, optical clarity requirements
- Unique combination of high hardness elastomers from extra long pot life systems
- <1.0% residual IPDI



AIRTHANE Prepolymer	Description	Nominal % NCO	Elastomer Durometer Diamine-Cured
PHP-80D	TDI-Polyether	10.8	80D
PET-75D	TDI-Polyether	9.1	75D
PHP-75D	TDI-Polyether	9.1	75D
PET-70D	TDI-Polyether	8.4	70D
PHP-70D	TDI-Polyether	8.3	70D
PET-60D	TDI-Polyether	7.3	60D
PET-95A	TDI-Polyether	6.2	95A/50D
PET-93A	TDI-Polyether	5.2	93A
PET-91A	TDI-Polyether	4.3	91A
PET-90A	TDI-Polyether	3.5	88A
PET-85A	TDI-Polyether	3.4	85A
PET-80A	TDI-Polyether	2.7	80A
PHP-70A	TDI-Polyether	2.1	70A

PPT-75D	TDI-PPG	8.5	75D
PPT-65D	TDI-PPG	7.6	65D
PPT-95A	TDI-PPG	6.3	95A/50D
PPT-80A	TDI-PPG	3.7	80A

PST-95A	TDI-Polyester	5.2	95A
PST-90A	TDI-Polyester	4.4	90A
PST-85A	TDI-Polyester	3.6	85A
PST-80A	TDI-Polyester	3.1	80A
PST-70A	TDI-Polyester	2.4	70A

APC-504	IPDI-Polyether	8.3	75D
API-470	IPDI-Polyether	6.7	65D

VERSATHANE®-C Prepolymers

TDI Prepolymers

- Broad range of TDI-polyether and TDI-polyester products
- Used to create high-performance elastomers that exhibit excellent strength, resilience and abrasion resistance
- Low residual TDI (<0.7%)
- Easy to melt “QM” TDI-polyester prepolymer
- SP grade is easier to degas
- Lower viscosity polyether-based products
- Uniform batch-to-batch consistency

VERSATHANE-C Prepolymer	Description	Nominal % NCO	Elastomer Durometer	
			Diamine-Cured	Triol-Cured
2070	TDI-Polyether	2.4	75A	—
1090	TDI-Polyether	5.2	90A	—
1160	TDI-Polyether	6.9	60D	—
A-7QM	TDI-Polyester	2.3	70A	45A
A-75QM	TDI-Polyester	2.6	75A	45A
A-8	TDI-Polyester	3.1	80A	55A
A-85	TDI-Polyester	3.6	85A	55A
A-85QM	TDI-Polyester	3.6	85A	55A
A-9	TDI-Polyester	4.2	90A	60A
A-9SP	TDI-Polyester	4.2	90A	60A
A-9QM	TDI-Polyester	4.2	90A	55A
D-5QM	TDI-Polyester	5.0	95A/50D	60A
D-55	TDI-Polyester	5.4	55D	65A
D-6	TDI-Polyester	5.8	70D	75A



VERSALINK® **Diamine Curatives**

- Designed for use with TDI or MDI prepolymers
- Produces high-performance room-temperature cast and cured elastomers
- Applications include cast prototypes and elastomers, coatings, adhesives, sealants and spray systems
- VERSALINK P-1000 and P-650 curatives are liquid at ambient conditions
- Also useful as an epoxy flexibilizer

VERSALINK Oligomeric Diamine	Description	Equivalent Weight
P-250	Oligomeric PTMEG-Diamine	225
P-650	Oligomeric PTMEG-Diamine	430
P-1000	Oligomeric PTMEG-Diamine	600

VERSALINK **Polyurethane Curatives**

VERSALINK 740M Curative

- FDA-approved†

VERSALINK Curative	Description	Equivalent Weight
740M	Diamine Curative	157
MCDEA	Diamine Curative	187

VERSALINK MCDEA Curative

- Designed for ultrahigh-performance elastomers
- Exceptional dynamic performance
- Improved high-temperature capability and expanded elastomer service temperature range
- Superior static properties; tear strength, resilience, hydrolytic stability, abrasion resistance

† AIRTHANE and VERSATHANE prepolymers and VERSATHANE 740M curative have been FDA-approved for use in elastomers that will come in contact with dry food under 21 CFR 177.1680.



Hardness

Polyurethane elastomers made with Air Products' polyurethane prepolymers are versatile engineering materials designed to provide properties not available in conventional rubbers, metals and plastics. They are capable of fulfilling the exacting requirements of the materials engineer for functional, high-performance, rubbery parts.

These polyurethane elastomers have higher oil and solvent resistance, and better aging properties than most general-purpose rubbers and plastics. They have greater abrasion and tear resistance than neoprene or natural rubber, coupled with greater load-bearing capacity. Their extensibility and impact strength are also greater than those of most plastics.

In addition, polyurethane elastomers made with Air Products' prepolymers can be formulated to cover a wide range of hardness, from soft rubbers to rigid plastics. Figure 1 shows the spectrum of hardness values possible and a few examples from the correspondingly wide range of applications.

The various options in Air Products' broad prepolymer product line enable the processor to select the right formulation to achieve the desired combination of engineering properties. The grade of prepolymer, the curative and special additives can all be selected to maximize the features most critical to each application.

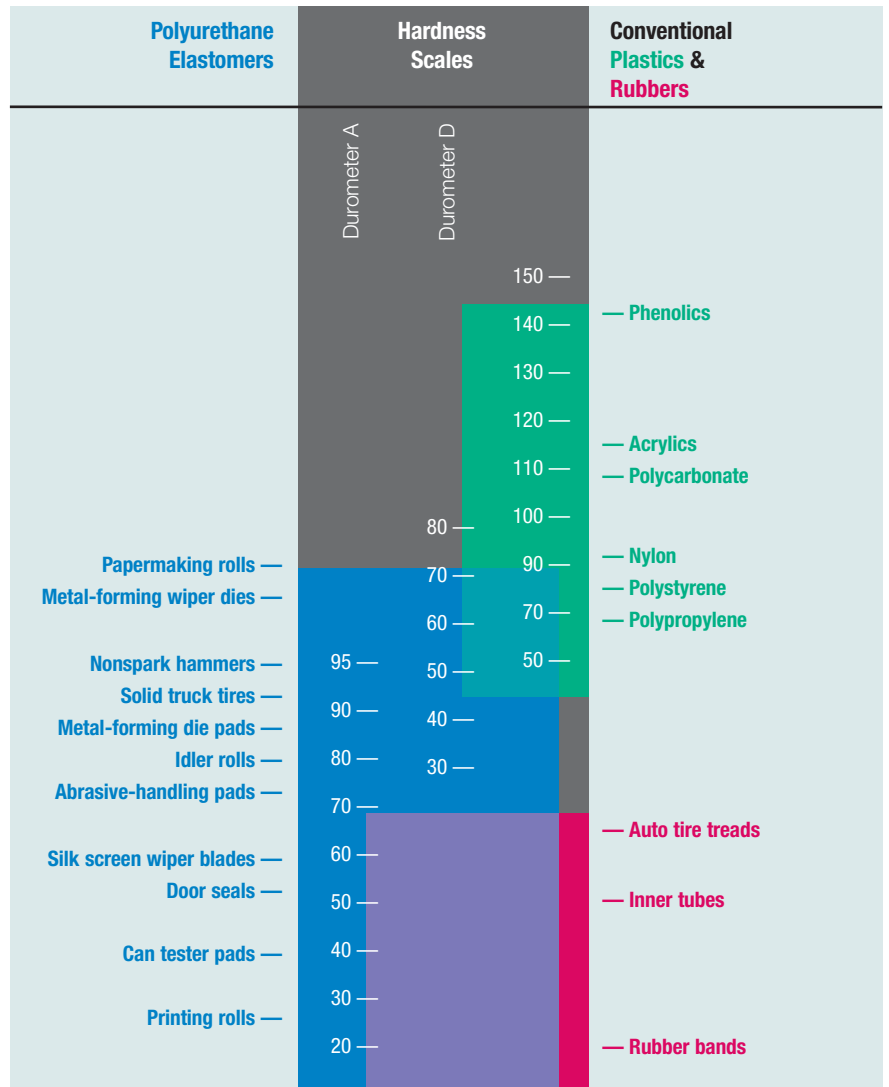


Figure 1



“Your Air Products’ PSP team has a basic, all-important mission: To understand your needs so that we meet and/or exceed your expectations, adding value wherever we can all along our global supply chain.”

Dr. Mark Conner, Technical Director



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Samples and Technical Information

If you would like additional information or samples, call our Product Information Center.

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