

# AirMail

TIMELY TECH TIPS AND HOT NEWS FOR OUR GLOBAL POLYURETHANE CAST ELASTOMER CUSTOMERS

## Making Prepolymers at Paulsboro: Focused on Our Customers

### PSP OFFERINGS

- Airthane® Prepolymers
- Versathane® Prepolymers
- Versalink® Polyurethane Curatives
- Lonzacure® MCDEA Curative
- Versalink Oligomeric Diamines

At our Paulsboro, N.J., plant, just down river from Philadelphia, we're passionate about making prepolymers, as we are with all of our chemicals.

Plant Manager Artis Williams points out that the focus is on total quality and batch-to-batch consistency so that customers can always expect the same performance results. "Worry free. That's how we want our customers to feel about their polyurethane elastomers made with our polyurethane prepolymers. And our world-class proprietary prepolymer manufacturing process provides that assurance. It's continually upgraded to reflect changing technology and to minimize any effects on environmental, health, and safety (EH&S) issues."



Up to 70 versions of the company's leading-edge Airthane and Versathane prepolymers are manufactured at Air Products' Paulsboro, N.J., chemicals plant.

### AIRTHANE® PHP-80D TDI Prepolymer

If you're looking to manufacture a product with high hardness, for example, a highly demanding roller application, Air Products' Airthane PHP-80D TDI prepolymer is an excellent choice.

It is a high hardness elastomer, providing a material with a Shore 80D (approximately 3 to 4 P&J) hardness when cured with MOCA.

Airthane PHP-80D prepolymer is the highest %NCO prepolymer in our Airthane high-performance polyether prepolymer line. It has a midpoint %NCO of 11.1 percent, yet retains a moderate viscosity, which drops rapidly upon modest heating.



Elastomers prepared using Airthane PHP-80D prepolymer have the highest modulus of any elastomer produced with our Airthane prepolymers. That means outstanding resistance to deformation under load.

Airthane PHP-80D prepolymer has a very rapid gel time, with short pot life for a MOCA-cured system. We also recommend machine processing.

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Williams notes that EH&S issues are equally important to meeting customer demands and requirements. "The Airthane prepolymers we make here contain less than one-tenth of one percent free TDI monomer and the Versathane prepolymers contain less than seven-tenths of a percent free TDI monomer compared with other TDI prepolymers available in the market today that contain up to several percent of TDI monomer. We manufacture only low-free residual monomer, high-performance prepolymers using TDI and IPDI ingredients."



Chuck Blasetto—  
Lab Analyst

The ISO 9002-certified Paulsboro plant is on a 10-acre tract in Gloucester County and employs nearly 70. It was built in the 1940s by the Houdry Process Company, which was

acquired by Air Products in 1962. Seven expansions have occurred since.

There are two main production operations, according to Jim Long, lead process engineer at Paulsboro: TEDA (triethyl-enediamine) and prepolymers with both supporting the global polyurethane industry. Being a global business, a significant percentage of production is shipped overseas.



Festus Morris, Jr.—  
Top Operator

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## Focused on Our Customers

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## Paulsboro, New Jersey Plant



Victor Chiodo—Lab Analyst/  
Quality Coordinator

Long says that the prepolymer production is dedicated to making up to 70 versions of the company's leading-edge Airthane and Versathane prepolymers. "Demand is growing and even though Paulsboro is our only prepolymer manufacturing site, we are readily able to meet our global demand and the sophisticated distribution network needed to serve customers worldwide."

more than that from a supplier to stand out from the crowd, to be the best at delivering value to customer. It takes passion and commitment. The end result is our customers have a sense of security that our products will perform." ▲



Joseph Tropea—  
Top Operator



Artis Williams—  
Plant Manager

Prepolymers are produced and packaged in 55-gallon drums or five-gallon pails. Most are standard formulations, though Long says that the plant has the ability to make custom prepolymers in large volumes for individual customers or groups of customers. "We're here to make our products user-friendly and application-specific."

But as Long states "We know it's not enough to simply supply products and services safely, on time, and within specification. That's good business—we've been committed to quality, timeliness, and safety excellence for more than 60 years. It takes



## AIRTHANE® PHP-80D TDI Prepolymer

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### Typical Prepolymer Properties

Property	Typical Range
% NCO (WT %)	10.8 – 11.4
Viscosity, 70 °C (cPs)	800
Residual Monomeric TDI (%)	< 0.1

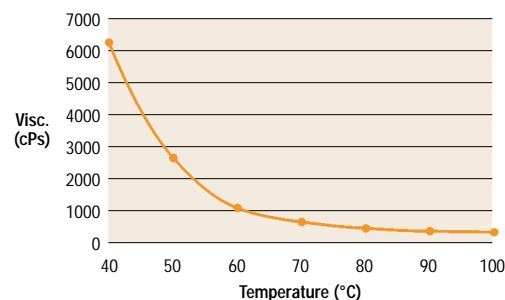
### Typical Processing Conditions

Property	MBOCA
Stoichiometry (%)	95
Prepolymer Temperature (°C)	70
Curative Temperature (°C)	125
Gel Time (Min, 100 °C)	1.6
Mold Temperature (°C)	100
Demold Time (Min)	15
Post Cure (Hr./Temp °C)	16/100

### Target Elastomer Properties

Property	Value
Hardness (Shore D)	80
Modulus—100% Elongation (psi)	6870
Tensile Strength (psi)	9273
Elongation (%)	176
Die C Tear Resistance (pli)	1108
Split Tear Resistance (pli)	121
Rebound (%)	66

### Typical Viscosity Curve of Airthane PHP-80D Prepolymer



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Airthane® Prepolymers • Versathane® -C-Prepolymers  
Versalink® Polyurethane Curatives • Lonzacure™  
MCEA Curative • Versalink Oligomeric Diamines

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