

MOLECULAR Chemical Systems™



Liquid Polyurethane Elastomer System
Technical Data Sheet

Aquapol® PI-13000-31 Prepolymer

Aquapol® PI-13000-31 prepolymer is an aliphatic urethane, end-capped prepolymer containing un-reacted isophorone diisocyanate (IPDI). Aquapol PI-13000-31 prepolymer will gel up to five times its weight of water and can be used to form stable gels with water. In contrast, concentrations of Aquapol PI-13000-31 prepolymer above 50% will result in closed cell foam rather than a gel. Gels will lose water to the atmosphere and should be protected with an impermeable membrane.

The speed of reaction can be increased or decreased by using warm or cold water respectively and by the concentration of the amine catalyst. Using cold water will reduce any tendency toward frothiness.

PHYSICAL Characteristics	
Characteristics	Benefits
Excellent shock absorption	Useful in sporting equipment, heavy duty cushioning applications and energy absorption
High capacity for heat and cold	Hot and cold compresses or packs
Moldable	Will maintain an infinite variety of shapes
Sterilization via radiation	Medical applications
Exceptionally hydrophilic	Forms stable high water-containing gels and can be formulated to generate foams with great aqueous absorption capacity
Contains no TDI	Low toxicity and fewer handling concerns

Typical Chemical Profile	
Property	Aquapol® PI-13000-31 Prepolymer
Viscosity @ 77 °F (cP)	12,000-25,000
Density @ 25 °C (lb/gal)	9.2-9.3
Storage Temperature (°F)	60-80
Shelf Life* (months)	4
NCO (%)	3.00-3.40

*Shelf life is dependent on storage conditions. Aquapol® PI-13000-31 Prepolymer should be stored in tightly capped containers with nitrogen blanketed head-space. Aquapol® PI-13000-31 Prepolymer should be stored in a temperature controlled environment of approximately 75°F. Avoid extreme temperatures and significant changes in temperature. Always have an SDS available.

Carpenter Co.
Chemical Systems Division
Customer Service 800-444-5132
www.carpenter.com

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Processing & Safety Information

Mix Ratio

Options*	Ingredients	Procedure
1	79 pbw water 20 pbw Aquapol® PI-13000-31 Prepolymer 1 pbw triethanolamine (TEA)	Mix 2 minutes. Gel time** = 7 minutes.
2	33 pbw water 1 pbw TEA 20 pbw Aquapol® PI-13000-31 Prepolymer 36 pbw chain extender	Premix water, TEA, and Aquapol® PI-13000-31 Prepolymer for 15 seconds. Add chain extender immediately and mix for 30 seconds. Gel time** = 10 minutes.
3	33 pbw water 1 pbw TEA 20 pbw Aquapol® PI-13000-31 Prepolymer 36 pbw chain extender	Premix water, TEA, and chain extender for 15 seconds. Add Aquapol® PI-13000-31 Prepolymer immediately and mix 2 minutes. Gel time** = 10 minutes.
4	33 pbw water 1 pbw TEA 20 pbw Aquapol® PI-13000-31 Prepolymer 36 pbw modifying resin	Premix modifying resin and Aquapol® PI-13000-31 Prepolymer for 30 seconds. Add water and TEA immediately and mix for 2 minutes. Gel time** = 30 minutes.

*The formulation ratios are listed in the order of decreasing firmness.

** Gel times are influenced by mix efficiency, component temperatures, and ambient conditions.

The above formulations are typical and intended only as a guide. Varying the order of addition of the chain extenders and concentrations will provide an infinite range of finished properties. Note that the modifying chain extenders replace water in the formulations, while the amount of Aquapol® PI-13000-31 Prepolymer remains constant.

Safety

All sales of products manufactured by Carpenter Co. and described herein are made solely on the condition that our customers comply with applicable health and safety laws, regulations, and orders relating to the handling of our products in the workplace.

Before using, please read all product labels and Safety Data Sheets for each product. A general Safety, Health, and Toxicity bulletin is also available from Carpenter. All this literature, if presently not on your site, can be obtained from the Customer Service Representative.

Polyurethane products manufactured or produced from this liquid system may represent a serious fire hazard if improperly used or allowed to remain exposed or unprotected. The character and magnitude of any such hazard will depend upon a broad range of factors which are controlled and influenced by the manufacturing and production process, by the mode of application or installation, and by the function and usage of the particular product. **Any flammability rating contained in this literature is not intended to reflect hazards presented by this or any other material under actual fire conditions. These ratings are used solely to measure and describe the product's response to heat and flame under controlled laboratory conditions.** Each person, firm, or corporation engaged in the manufacture, production, application, installation, or use of any polyurethane product should carefully determine whether there is a potential fire hazard associated with such product in a specific usage and utilize all appropriate precautionary and safety measures. In case of an emergency please call **Chemtrec** at :

800-424-9300.

Ordering

Molecular Chemical Systems™ are available in bulk (tankwagon), tote bin, or 55-gallon drum.

To place an order or obtain additional information, please call **Customer Service at 800-444-5132.**