

SPUR+* 1050 Prepolymer



MARKETING BULLETIN

SILANES - ADHESIVES & SEALANTS ADDITIVES

SPUR+ 1050 prepolymer is a silylated prepolymer, plasticizer-free, with low viscosity, for use in the manufacture of one-part, moisture-curing sealants. It is an excellent material of choice as a base resin for medium modulus sealants and adhesives in industrial and transportation applications where higher tensile strength is required.

Key Features and Typical Benefits

- Broad formulation latitude
- Cost-effective
- Easy application characteristics
- Excellent adhesion to many surfaces without primer
- High durability indoors and outdoors
- Good water and chemical resistance
- High elastic recovery
- Long shelf life

Typical Physical Properties

	SPUR+ 1050 Prepolymer
Appearance	Clear, Viscous liquid
Viscosity (25 °C) (mPa)	≈ 35,000
Plasticizer	none
Shelf Life (months)	24
Tensile Strength (N/mm ²)	0.68
Elongation (%)	150
100% Modulus (N/mm ²)	0.55
Shore A	29
Elastic Recovery (%)	87

Typical properties are average data and are not to be used as or to develop specifications.

Key Features of SPUR+ Prepolymer Technology

Silane-terminated polyurethanes (SPUR+ prepolymers) have become increasingly attractive to manufacturers of adhesives, sealants and coatings. This hybrid technology is appealing because of the synergy between the silane-curing mechanism and polyurethane backbone properties.

Formulations developed through this technology offer fast room-temperature cure and good durability, while the sealants or adhesives they produce are free of unreacted isocyanate. Benefits of the resulting products also include freedom from bubbling during cure and a broadening of the formulation latitude compared to conventional polyurethane technologies. These prepolymers allow the formulator to use a wide variety of additives and adhesion promoters to meet end users' performance needs, such as:

1. Good elasticity and durability
2. Primerless adhesion to both organic and inorganic, porous and non-porous substrates
3. Superior chemical resistance, such as to automotive fluids
(e.g., glycols, motor and transmission fluids)
4. Minimal shrinkage
5. Excellent weatherability
6. Immediate paintability
7. Non-staining of porous substrates

Performance of SPUR+ Sealants

The following generic sealant formulae may be used to evaluate the performance characteristics of SPUR+ prepolymers.

Ingredients
SPUR+ 1050 Prepolymer
Plasticiser (DIDP)
Moisture Scavenger (Silquest A-171* Silane)
Calcium carbonate
UV stabilizers
SiO ₂
TiO ₂
Adhesion Promoter (Silquest* A-1110 Silane)
Tin catalyst

The SPUR+ prepolymer content represents 23% of the total formulation.

The mechanical properties are measured after curing the sealants for 2 weeks at 23 °C/50% relative humidity, and testing according to ISO 37 (tensile properties), ISO 868 (Shore A hardness).

	SPUR+ 1050 Prepolymer
Elongation at break (%)	305
100% Modulus (N/mm ²)	1.24
Tensile Strength (N/mm ²)	1.97
Hardness Shore A	46.1

References

- [1] Saunder, J.H. and K.C. Frisch, Polyurethanes: Chemistry and Technology, Vol. I, Part I, Interscience, NY (1962), P. 273. (b)
- [2] (a) Feng, T.M. and B.A. Waldman, "Silylated Urethane Polymers Enhance Properties of Construction Sealants," *Adhesives Age*, April 1995. (b) Landon, S.J. A. Guillet and R.R. Johnston, ("Silylated Urethane Polymers for Sealants,") *European Adhesives and Sealants*; Dec. 1995.
- [3] Landon, S.J., M.B. Dawkins, B.A. Waldman, R.R. Johnston, "The Adhesion of Hybrid Resins to Plastic Substrates;" *Adhesives Age*, April 1997.
- [4] Huang, M.W., and R. Handel, "New Developments in Silylated Polyurethane Technology," *Adhesives Age*, April 1999.
- [5] Johnston, R.R. and P. Lehmann, US 5,990,257.

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