

# **SILCAT\* R Silane**













Performance properties of silanecrosslinked polyethylene can meet or exceed those of peroxidecrosslinked polyethylene, while offering advantages in broader processing latitude and lower fabrication costs. Silcat R crosslinking vinylsilane incorporates grafting and crosslinking catalysts in a ratio suitable for crosslinking polyethylene in commercially available extrusion equipment. Silcat R crosslinking silane modifies polyethylene resins chemically during melt processing (i.e., extrusion) and effects polymer crosslinking upon exposure of the fabricated polyethylene to moisture.

# **Key Features and Typical Benefits**

- higher maximum use temperature
- reduced deformation under load (creep)
- improved chemical resistance
- superior environmental stress crack resistance
- increased abrasion resistance
- memory characteristics (for shrink film and tubing)
- improved impact strength

Typical Physical Properties	
Physical Form	Clear liquid
Flash Point, Tag Closed Cup, ASTM D56-79, °F (°C)	68 (20)
Specific Gravity at 25/25°C	0.9762
Viscosity at 25°C, cSt	0.7
Color	Light straw

# Advantages of Silane Versus Radiation or Peroxide Crosslinking

- low capital investment
- low operating costs
- higher productivity
- processing versatility
- thick, thin, or variable thickness possible
- complex shapes possible
- wider processing latitude (control of premature crosslinking)
- useful with filled composites
- applicable to all polyethylene densities and copolymers

#### **Reaction Sequence**

The following reactions describe the basic chemistry:

#### Grafting

#### Crosslinking

$$\begin{array}{c|c} \text{2(CH}_2\text{CH}_2\text{CHCH}_2)_n & \xrightarrow{\text{Catalyst}} & \text{(CH}_2\text{CH}_2\text{CHCH}_2)_n \\ & \downarrow & \downarrow & \downarrow \\ & \text{CH}_2\text{CH}_2\text{Si}(\text{OH})_3 & \text{CH}_2\text{CH}_2\text{Si} \\ & \downarrow & \downarrow & \downarrow \\ & \text{CH}_2\text{CH}_2\text{Si} & \downarrow & \downarrow \\ & & \downarrow & \downarrow & \downarrow \\ & & \text{CH}_2\text{CH$$

#### **Patent Status**

Nothing contained herein shall be construed to imply the nonexistence of any relevant patents or to constitute the permission, inducement or recommendation to practice any invention covered by any patent, without authority from the owner of the patent.

### **Product Safety, Handling and Storage**

Customers considering the use of this product should review the latest Material Safety Data Sheet and label for product safety information, handling instructions, personal protective equipment if necessary, and any special storage conditions required. Material Safety Data Sheets are available at <a href="www.momentive.com">www.momentive.com</a> or, upon request, from any Momentive Performance Materials representative. Use of other materials in conjunction with Momentive Performance Materials products may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

#### Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

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# **Emergency Service**

Momentive Performance Materials maintains an around-the-clock emergency service for its products. The American Chemistry Council (CHEMTREC) and CareChem24 International also maintain an around-the-clock emergency service for all chemical products:

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	(Albanian, Czech, Danish, Dutch, English, Finnish, French, German, Greek, Hungarian, Italian, Lithuanian, Norwegian, Polish, Portuguese, Romanian, Russian, Serbo-Croatian, Slovak, Spanish, Swedish, Turkish, Ukrainian)	
Middle East,	F40 000 0F00	004.0.407.007.(  -
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DO NOT WAIT. Phone if in doubt. You will be referred to a specialist for advice.

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