



MOMENTIVE
performance materials

Products for the textile industry Textile Enhancers



Our Program

The textile market is undergoing major changes. Brand new fibres are invented and developed, new application areas are exploited and niche market segments are being targeted. This inevitably leads to increasing diversification but also imposes ever more demanding requirements on numerous chemicals that are used in the production of fabrics and garments. One direct result is the requirement to run machines at textile mills at higher production rates, stretching both machines and personnel to their limits. Inevitable mistakes do take place and only the most robust and well developed products may ensure an error-free production. At Momentive Performance Materials we recognized this trend and responded by developing a series of products that can deliver superior benefits to fabrics, be easily formulated and yield formulations of excellent stability. They are our range of Textile Enhancers.

Selector Tool

Property		Magnasoft SRS textile softener	Magnasoft JSS hydrophilic textile enhancer	Magnasoft DerMa NT textile enhancer
Softness	Natural	++	++	+++
	Synthetics	+++	Data not available	++
Hydrophilicity	Natural	---	++	+++
	Synthetics	+++	Data not available	++
Absorbency	Natural	++	++	+++
	Synthetics	++	Data not available	+++
Durability		+	+	++
Yellowing		+++	++	+++
Emulsion Stability		++	+++	++
Ease of formulating		+++	+++	++
Typical Target Fabrics		Polyester Acrylic Fibres Wool Cashmere	Cotton Knit Viscose Rayon Tencel	Cotton, Polycotton, Wovens Cotton Spandex Cotton Knit Bamboo
Effect		Slippery and Full	Bulky and Full	Silky and Bulky
Wash Durability of effects		1-3 Laundry Cycles	1-3 Laundry Cycles	10 Laundry Cycles
Alkaline Stability		Good	Excellent	Moderate
Recommended Application Process		Continuous, Padding Jet Flow Overflow	Jet Flow Overflow Winch Padding	Exhaust Jet Flow Overflow Winch Padding

Table 1: Product selector tool for Momentive Performance Materials Textile Enhancers (+++ = excellent; --- = poor).

Products Description

Momentive Performance Materials Textile Enhancers are the result of several years of surface chemistry research in our laboratories and are likely to alter the way the industry views silicone products. Textile Enhancers are multi-functional silicones developed to cover a broad range of application and performance needs. These molecules are based on our patented or patent-pending block copolymer technology. In addition to a powerful softening ability, they can deliver a whole spectrum of benefits like brilliant, more natural hand, low-yellowing potential, ease of formulating, end-use formulation stability and many more. This excellent combination of typical benefits may enable product differentiation and allow formulations with best-in-class benefits or products that perform under the most demanding conditions.

Portfolio

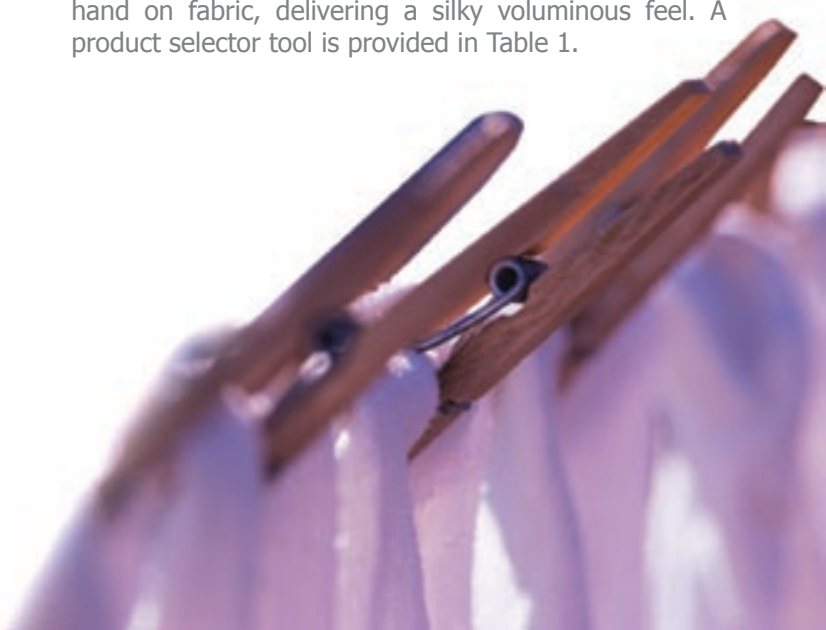
We offer a selection of three Textile Enhancers - see Table 2 below. They are available as concentrates or solutions. Each of them has been optimized to perform best either in formulation stability, treatment of natural or treatment of synthetic fibres:

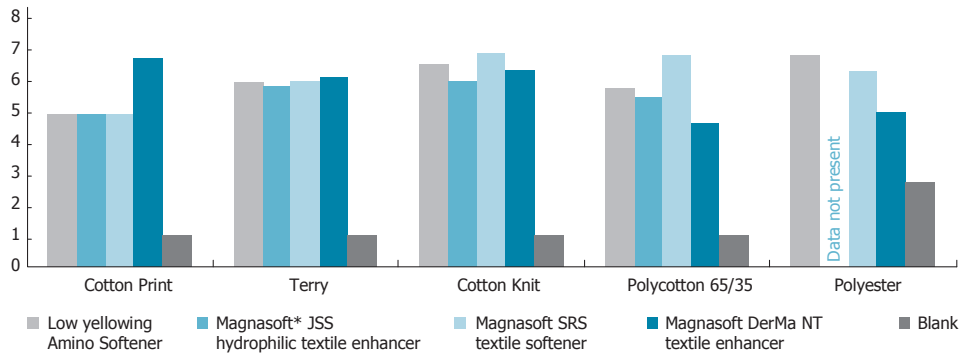
Product	Delivery Form	Active Level	Viscosity [mPas]	Chemistry
Magnasoft JSS hydrophilic textile enhancer	Concentrate	70%	4500	Amino
Magnasoft SRS textile softener	Solution	30%	6500	Amino
Magnasoft DerMa NT textile enhancer	Solution	85%	10000	Quat

Table 2.

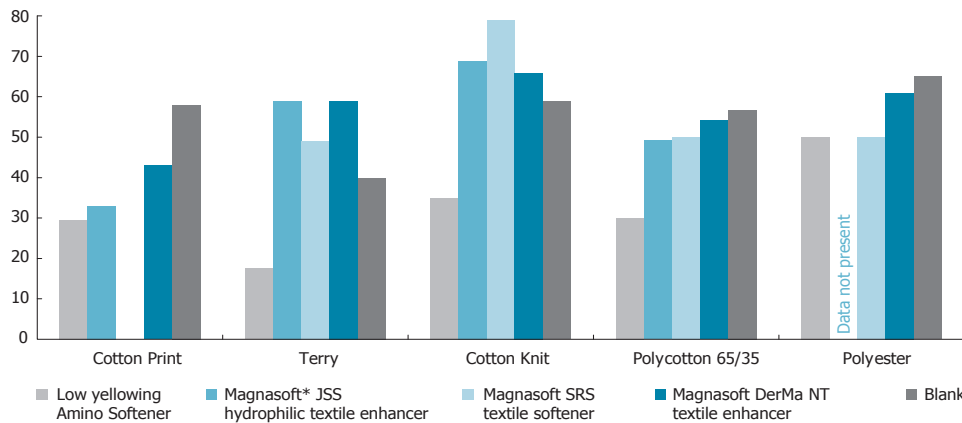
Supporting Data

Our Textile Enhancers can impart superior softening compared to traditional silicone softeners and at lower addition levels (Graph 1). Furthermore, standard amino silicone softeners render fabrics hydrophobic, whereas Magnasoft* JSS hydrophilic textile enhancer and Magnasoft DerMa NT textile enhancer typically maintain or improve the water absorbency (Graph 2) and hydrophilicity (Graph 3) of all tested fabrics. Also, they typically confer a distinguishable, excellent hand on fabric, delivering a silky voluminous feel. A product selector tool is provided in Table 1.

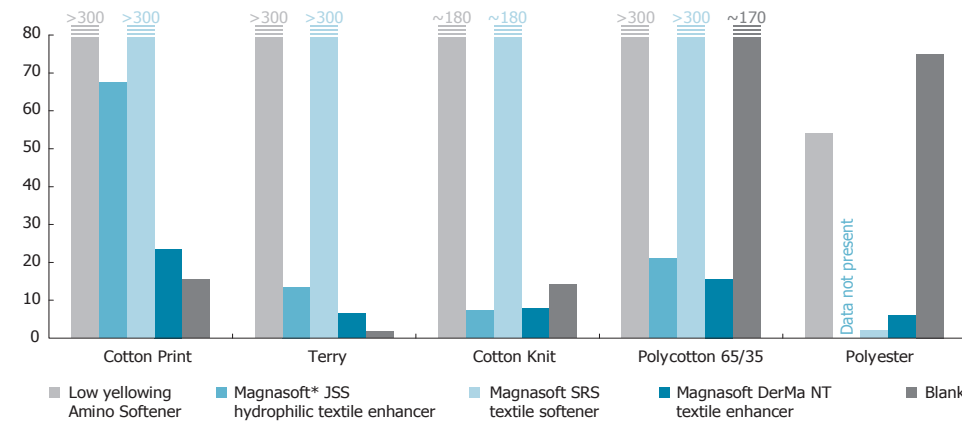




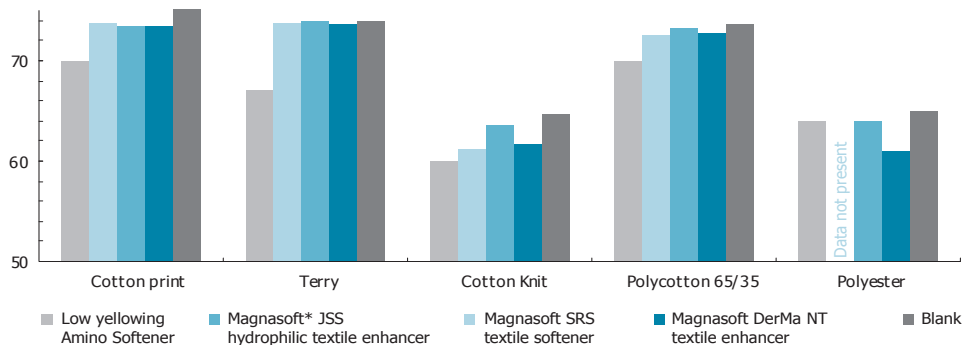
Graph 1: Softness evaluation hand panel (the higher the number the softer), 0.5% add-on level, ASTM standard D-5237.



Graph 2: Wicking Height [mm] (the higher the number the more absorbent), 0.5% add-on level, ASTM standard D-5237-9.0.



Graph 3: Wetting Data [sec.] (the lower the number the quicker the wetting, 300sec. maximum observation time), 0.5% add-on level.



Graph 4: Whiteness Data (the higher the number the whiter), 0.5% add-on level, ASTM standard D-5237.

Note: Test data. Actual results may vary.



Excellent for soil release treated fabrics, synthetics and wool - Magnasoft* SRS textile softener

Product Description

Magnasoft SRS textile softener is a new $(AB)_n$ linear, siloxane-amino-polyether block-copolymer. Magnasoft SRS textile enhancer can provide soft silky, full hand to synthetic and wool fabrics. It is an excellent candidate to consider as a softener for fluorocarbon soil release treated fabrics, as it typically provides softening benefits while exhibiting little or no interference with the soil release properties (see Table 3).

Key Performance Criteria

- Can provide a high level of softness to all types of fabrics, especially synthetics.
- Does not typically interfere with the soil release properties of fluorocarbon agents.
- Little or no yellowing.
- Water dispersible.
- Ready to use product.

Application

Magnasoft SRS textile softener does not need emulsification. It is self dispersible in water with moderate stirring. The dilution can then be added into the finishing bath to deliver the desired effect. Use levels of 0.05 to 0.5% of silicone active BOWF are recommended. More information is available in the technical data sheet or from our Technical Service Specialists. Magnasoft SRS textile softener can be particularly effective on polyester and specifically polyester fleece fabrics. Used under typical exhaust conditions and levels of 3 to 5g/l (1:10 liquor to goods ratio), it can deliver excellent softness and bulkiness. Similar effects can be delivered on wool and wool/cashmere blends.

Treatment	Soil Release Rating ^{a)} (dirty Motor Oil)				Softness ^{b)}		
	Initial	1 st Wash	5 th Wash	Re Stain & 1 Wash	Initial	1 st Wash	5 th Wash
SRS/ FC-248/ Resin	1.0	3.0	3.5	3.5	7.0	7.0	6.0
SRS/ FC-248/ Resin	1.0	1.5	3.0	2.0	8.0	6.0	5.0
FC-248/ Resin	1.0	3.5	4.0	4.0	2.0	2.0	2.0

Table 3: Soil Release Rating, Softness and Silicone Durability on 100% Cotton Twill Fabric treated with 1.0% FC 248, 1.0% Silicone, BOWF.

^{a)} Soil release was determined by AATCC method 130-1990, using the stain replic scale: 1-5. Washed with 60°C water.

^{b)} Softness was rated by a hand panel of five people: Softness rating scale: 8 = very soft, 1 = harsh.

Note: Test data. Actual results may vary.

Our solution for the most challenging process conditions - Magnasoft* JSS hydrophilic textile enhancer

Product Description

Magnasoft JSS hydrophilic textile enhancer is a revolutionary product whose aqueous dispersions possess excellent stability under alkaline and high temperature conditions. Conventional amino silicone emulsions in such an environment would separate and cause silicone spots. Dilutions of Magnasoft JSS hydrophilic textile enhancer are extremely shear stable, even at the highly alkaline pH of 14 and at the high temperature of 100°C. Furthermore, its dilutions typically remain stable even after boiling at a high pH, conditions that are often encountered in dye houses when dyes need to be stripped off a poorly dyed fabric. Magnasoft JSS hydrophilic textile enhancer can deliver a soft, silky and full hand feel combined with a hydrophilic character to a range of fabrics at lower use levels than traditional products. It is an excellent candidate to consider for cotton knits and cotton garments. In summary, Magnasoft JSS hydrophilic textile enhancer may be the ideal hydrophilic silicone softener for tough operating conditions.

Key Performance Criteria

- Excellent pH, temperature and shear stability.
- Easy to handle liquid that can be readily diluted in water with minimal stirring.
- Little or no yellowing.
- Amazing silicone softness.
- Typically imparts hydrophilic properties.
- Ready to use product.



Picture 1:
1% Conventional amino silicone softener emulsion after boiling at 100°C, pH: 12.



Picture 2:
1% Magnasoft JSS hydrophilic Textile Enhancer water solution after boiling at 100°C, pH: 12.

Note: Test data. Actual results may vary.

Application

Magnasoft* JSS hydrophilic textile enhancer can be used as received or diluted to any active level. The preferred range is 5.0 to 30.0% of Magnasoft JSS hydrophilic textile enhancer according to Table 4. The optimum treatment will depend on the required softness of the fabric or yarn after dyeing and rinsing. The use of 0.05 to 0.5% of silicone active BOWF is recommended. Application can be done by pad-dry-cure, exhaustion or during the garment washing process. Magnasoft JSS hydrophilic textile enhancer is an excellent candidate to consider for yarn finishing. More information is available in the technical data sheet or from our Technical Service Specialists.

Sample formulation

Formulation	1 [%]	2 [%]	3 [%]	4 [%]
Magnasoft JSS	5.00	10.00	20.00	30.00
Alcohol Ethoxylated-EO ₁₅	-	00.30	01.00	01.50
Biocide	00.05	00.05	00.05	00.05
Water	94.95	89.65	78.95	68.45

Table 4: Formulation guidelines for Magnasoft JSS hydrophilic textile enhancer.

Process:

1. Charge water and surfactant into mixing vessel, stir at 400 rpm until surfactant is completely dissolved.
2. Add Magnasoft JSS hydrophilic textile enhancer slowly under stirring and continue to stir for 5 minutes.
3. Add biocide if needed. Mix for an additional 10 minutes.
4. Filter to a container.

Product formulations are included as illustrative examples only. Momentive makes no representation or warranty of any kind with respect to any such formulation, including, without limitation, concerning the efficacy or safety of any product manufactured using such formulations.



Our premium, permanent, exhaustible softener - Magnasoft* DerMa NT textile enhancer

Product Description

Magnasoft DerMa NT textile enhancer is a revolutionary textile auxiliary agent that can deliver a hydrophilic, voluminous, silky hand to many types of fabrics at typically lower use levels than other products and, very significantly, retain these performance attributes through several home laundry cycles.

Magnasoft DerMa NT textile enhancer is based on our patented, new, linear (AB)_n block-copolymer platform. It is a hydrophilic, quat functional silicone copolymer that can deliver a highly desirable key new benefit: increased permanency of effects. Graph 5 shows the excellent durability performance of Magnasoft DerMa NT textile enhancer versus standard hydrophobic and hydrophilic amino softeners.

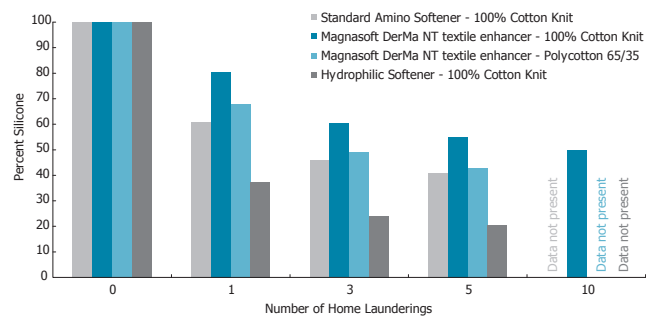
Magnasoft DerMa NT textile enhancer may not only coat the fibre surface (Picture 3), delivering an unusual full and rich hand, but also penetrate deeply and homogeneously into the interior of natural fibres (Picture 4 and 5), modifying each fibre and therefore enhancing the fabric's performance.

Easily emulsified, Magnasoft DerMa NT textile enhancer can be applied by padding but may be better suited for exhaust applications where its excellent emulsion stability may enable it to deliver full benefits to the end user.

Key Performance Criteria

- Excellent durability to laundering.
- Bulky softness as opposed to a greasy or slick feel.
- Better on natural fibres than synthetic fibres.
- Excellent for exhaustion applications.
- Fibre elasticity and shape recovery.
- Good hydrophilicity.
- Shear stable formulations.

Wash Durability of Magnasoft DerMa NT textile enhancer

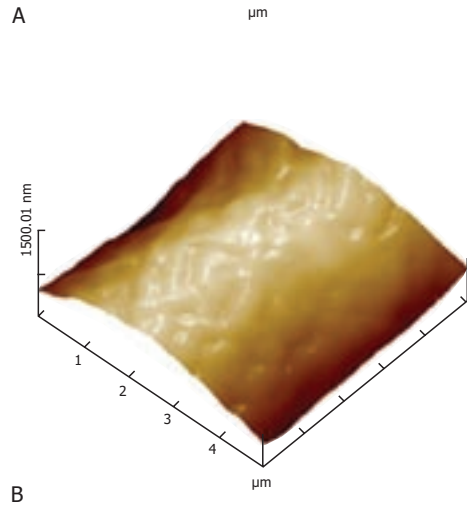
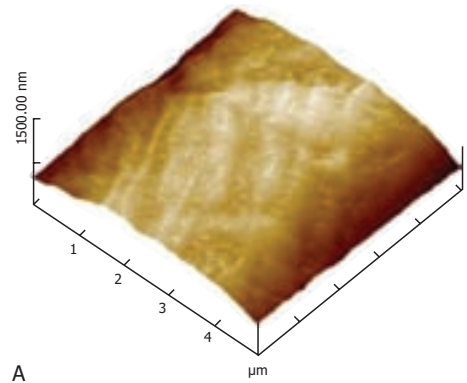


Graph 5: Silicone softener remaining on fabrics after several laundry cycles (EU full cycle wash conditions, 40°C, Low Duty Liquid).

Note: Test data. Actual results may vary.

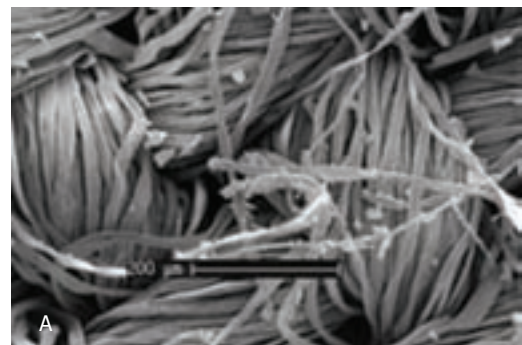
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Surface Treatment



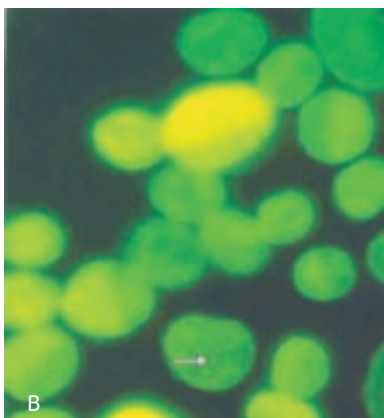
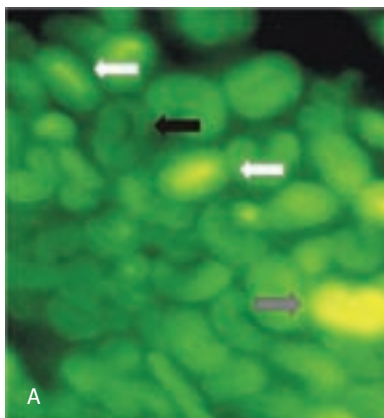
Picture 3: Atomic force micrographs of a single cotton fibre surface: A) untreated, B) treated with Magnasoft DerMa NT textile enhancer.

Homogeneous Treatment



Picture 4: Micrographs of 100% cotton woven: A) untreated, B) fluorescently labeled Magnasoft DerMa NT textile enhancer visualizing the homogeneous treatment of fabrics.

Fibre Penetration



Picture 5: Micrographs of cross sections of fibres treated with fluorescent labelled Magnasoft DerMa NT textile enhancer, visualizing the complete penetration of the fibre interior: A) cotton, B) wool.

Application

Magnasoft* DerMa NT textile enhancer needs to be emulsified before use. The preferred concentration is 5.0 to 35.0% of Magnasoft DerMa NT textile enhancer. A 35 weight-% actives emulsion recipe and emulsification procedure is provided in Table 5, all other concentrations are generated by simply diluting the emulsion with water under moderate stirring (Table 6). The optimum dosage of the emulsion in the finishing bath will depend on the required softness of the fabric or yarn after dyeing and rinsing. The use of 0.10 to 0.50% of silicone active BOWF is recommended.

Application can be done by pad-dry-cure, exhaustion or garment washing process. However, the most recommended process is exhaust as this should allow Magnasoft DerMa NT textile enhancer to deliver its full range of benefits. More information is available in the technical data sheet or from our Technical Service Specialists.

Sample Formulation

Materials	Blend [#]	Amount [Weight-%]	Function
Magnasoft DerMa NT textile enhancer	1	41.20	Active
C ₁₃ -alcohol-EO ₆ (HLB11.5)	1	15.00	Emulsifier
Sodium Acetate	2	0.75	Buffer 1
Acetic acid	2	1.00	Buffer 2
Water	2	43.80	Continuous Phase

Table 5: Micro-emulsion formulation guidelines for Magnasoft DerMa NT textile enhancer.

Process for the formulation provided in Table 5:

1. Blend 1: Charge Magnasoft DerMa NT textile enhancer and emulsifier into mixing vessel, stir at 400 rpm until homogeneously blended.
2. Blend 2: Completely dissolve Buffer 1 and Buffer 2 in the water.
3. Add slowly or in 4 to 6 portions Blend 2 under stirring to Blend 1. In case of portions insure homogeneous blending between portion additions.
4. A water-clear, colorless to slightly yellow micro-emulsion should be obtained.

Formulation	Dilution 1% [Weight-%]	Dilution 5% [Weight-%]	Dilution 10% [Weight-%]
Magnasoft DerMa NT textile enhancer 35%	2.90%	14.25%	28,50%
Water	97.10%	85.75%	71.50%

Table 6: Dilution guidelines for Magnasoft DerMa NT textile enhancer 35% Emulsion.

Process for the formulation provided in Table 6:

1. Charge Magnasoft DerMa NT textile enhancer (35weight-% active) into mixing vessel.
2. Add slowly water, stir at 400 rpm until homogeneous.
3. A water-clear, colourless to slightly yellow micro-emulsion should be obtained.

Note: Test data. Actual results may vary.



Patent Status

Technical subject matter in this publication is described and protected by one or more of the following U.S. Patents and their foreign counterpart patents and/or patent applications: U.S. Patents Nos US 6,475,568 and US 5,807,956. Other US and foreign patents and/or patent applications not listed covering the subject matter may be relevant.

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 www.momentive.com or, upon request, from any Momentive Performance Materials representative. Use of other materials in conjunction with Momentive Performance Materials products (for example, primers) 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.

Emergency Service

Momentive Performance Materials maintains an around-the-clock emergency service for its products. The American Chemistry Council (CHEMTREC), Transport Canada (CANUTEC), and the Chemical Emergency Agency Service also maintain an around-the-clock emergency service for all chemical products:

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