

## Magnasoft\* TLC

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#### Description

Magnasoft TLC softener is a watersoluble organomodified silicone fluid designed to impart softness and hydrophilicity to a variety of woven and nonwoven fabrics. Substrates to which Magnasoft TLC softener has been successfully applied are 100% synthetics, such as polyester, polypropylene, and polyethylene, as well as a variety of polyester/cotton blends.

Magnasoft TLC softener is nonionic in nature and, therefore, compatible with a broad range of other formulating components with which it might be used. In addition, Magnasoft TLC softener increases the tear strength and flex abrasion properties of certain fabrics.

Magnasoft TLC softener markedly improves the hydrophilicity of hydrophobic substrates and does not interfere with the wettability of hydrophilic substrates. With only limited durability, Magnasoft TLC softener is suggested primarily for single-use or limited-life products.

#### Key Features and Benefits

- Water-soluble
- Excellent hydrophilicity
- Imparts good softening properties
- Improves fabric strength
- Shear-stable
- Excellent compatibility with other formulating components
- Economical

#### Typical Physical Properties

Appearance	Clear Liquid
Percent Actives	100
Ionic Nature	Nonionic
Nominal Viscosity, cSt	425

Cloud Point, 1% solution, °C (°F)	48 (118)
Solvents	Water, Alcohol

### Processing Recommendations

#### 100% Polyester Nonwoven [(1.3 oz/yd<sup>2</sup>)(44 g/m<sup>2</sup>)]

Pad Bath Formulation	Weight Percent	
	Magnasoft TLC softener	Water
Magnasoft TLC Softener	0.65	—
Water, distilled	99.35	100.0
Solids Pick-up, %	0.9	0.0
Dry/Cure Cycle at 340°F (170°C), min	1.5	1.5
Performance		
Softness <sup>(1)</sup>	1.0	5.0
Wettability <sup>(2)</sup> , sec	3.0	>300
Elmendorf Tear <sup>(3)</sup> , g	1020	635

(1) 1 = Softest, 5 = Harshesht

(2) AATCC 79-1980

(3) ASTM D1424-83

#### Polyester/Cotton = 65/35 Woven Broadcloth [(3.0 oz/yd<sup>2</sup>) (102 g/m<sup>2</sup>)]

Pad Bath Formulation	Weight Percent	
	Magnasoft TLC softener	Water
Dp Resin (38%)	15.00	15.00
Resin Catalyst (64%)	2.25	2.25
Magnasoft TLC Softener	1.18	—
Water, distilled	81.57	82.75
Silicone Solids Pick-up, %	1.0	0.0
Dry/Cure Cycle at 340°F (170°C), min	1.5	1.5
Performance		
Softness <sup>(1)</sup>	1.0	5.0
Wettability <sup>(2)</sup> , sec	5.0	6.0

(1) 1 = Softest, 5 = Harshesht

(2) AATCC 79-1980

#### 100% Polypropylene Nonwoven [(0.7 oz/yd<sup>2</sup>) (24 g/m<sup>2</sup>)]

Pad Bath Formulation	Weight Percent	
	Magnasoft TLC softener	Water
Magnasoft TLC Softener	0.33	—
Water, distilled	99.67	100.0
Silicone Solids Pick-up, %	0.6	0.0
Dry/Cure Cycle at 245°F (118°C), min	1	1
Performance		
Softness <sup>(1)</sup>	1.0	5.0
Wettability <sup>(2)</sup> , sec	<1	>300

(1) 1 = Softest, 5 = Harshesht

(2) AATCC 79-1980

### 100% Fused Polyester Nonwoven [(0.5 oz/yd<sup>2</sup>) (17 g/m<sup>2</sup>)]

Pad Bath Formulation	Weight Percent	
	Magnasoft TLC softener	Water
Magnasoft TLC Softener	0.5	—
Water, distilled	99.5	100.0
Silicone Solids Pick-up, %	0.9	0.0
Dry/Cure Cycle at 340°F (170°C), min	1.5	1.5
Performance		
Softness <sup>(1)</sup>	1.0	5.0
Wettability <sup>(2)</sup> , sec	Immediate Strike Through	>300
Elmendorf Tear <sup>(3)</sup> , g	1710	1040

(1) 1 = Softest, 5 = Harshesht

(2) AATCC 79-1980

(3) ASTM D1424-83

### 100% Polyester Woven Fabric, Heat Set [(3.7 oz/yd<sup>2</sup>) (125 g/m<sup>2</sup>)]

Pad Bath Formulation	Weight Percent	
	Magnasoft TLC softener	Water
Magnasoft TLC Softener	1.18	—
Water, distilled	98.82	100.0
Silicone Solids Pick-up, %	1.0	0.0
Dry/Cure Cycle at 340°F (170°C), min	1.5	1.5
Performance		
Softness <sup>(1)</sup>	1.0	5.0
Wettability <sup>(2)</sup> , sec	5.0	>300
Elmendorf Tear <sup>(3)</sup> , g		
Warp	8000	6700
Fill	5000	4200

(1) 1 = Softest, 5 = Harshesht

- (2) AATCC 7H9-1980
- (3) ASTM D1424-83

**Kawabata Softness Evaluations**

Softness may also be evaluated with Kawabata instrumentation and correlated to hand panel evaluations. The Kawabata Evaluation System (KES) is designed to measure the low deformation forces encountered when manipulating fabric for softness. The result of Kawabata evaluations on polypropylene nonwoven [(0.75 oz/yd<sup>2</sup>) (25.5 g/m<sup>2</sup>)] treated with 0.3 percent Magnasoft TLC add-on are listed in Table 1.

**Table 1: Evaluation of Low Deformation Forces by Kawabata Instrumentation for 100% Polypropylene Nonwoven [(0.75 oz/yd<sup>2</sup>) (25.5 g/m<sup>2</sup>)]**

Finish	Force		
	G	RC	RT
Untreated	7.6	62.1	54.6
Magnasoft TLC Softener	6.2	61.9	56.5

Where:

- G = Shear rigidity (the larger the value, the more difficult to shear), g/cm•degree
- RC = Compressional resilience (the larger the value, the better the recovery), %
- RT = Tensile resilience (the larger the value, the better the recovery properties), %

Table 2 illustrates the correlation between Kawabata calculated data and hand panel evaluations for treated and untreated polypropylene substrates. The softness values are calculated according to the expression:

$$\text{Softness} = -194.3 + 11.5 (\ln [G]) + 2.8(\text{RC}) + 0.12(\text{RT}) \pm 0.46$$

**Table 2: Comparison of Kawabata and Hand Panel Softness Values<sup>(1)</sup> for 100% Polypropylene Nonwoven [(0.75 oz/yd<sup>2</sup>) (25.5 g/m<sup>2</sup>)]**

Finish	Hand Panel	Kawabata
Untreated	10.0	9.6
Magnasoft TLC Softener	6.5	6.8

(1) 1 = Softest, 10 = Harshes, 5 = Epoxy silicone standard

As the data show, the calculated values from the Kawabata evaluation are in good agreement with those obtained through a hand panel.

**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.

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