

Magnasoft™ TLC Hydrophilic Softener

Magnasoft* TLC

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/yd²)(44 g/m²)]

| 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 ⁽¹⁾ | 1.0 | 5.0 |
| Wettability ⁽²⁾ , sec | 3.0 | >300 |
| Elmendorf Tear ⁽³⁾ , 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/yd²) (102 g/m²)]

| 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 ⁽¹⁾ | 1.0 | 5.0 |
| Wettability ⁽²⁾ , sec | 5.0 | 6.0 |

(1) 1 = Softest, 5 = Harshesht

(2) AATCC 79-1980

100% Polypropylene Nonwoven [(0.7 oz/yd²) (24 g/m²)]

| 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 ⁽¹⁾ | 1.0 | 5.0 |
| Wettability ⁽²⁾ , sec | <1 | >300 |

(1) 1 = Softest, 5 = Harshesht

(2) AATCC 79-1980

100% Fused Polyester Nonwoven [(0.5 oz/yd²) (17 g/m²)]

| 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 ⁽¹⁾ | 1.0 | 5.0 |
| Wettability ⁽²⁾ , sec | Immediate Strike Through | >300 |
| Elmendorf Tear ⁽³⁾ , 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/yd²) (125 g/m²)]

| 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 ⁽¹⁾ | 1.0 | 5.0 |
| Wettability ⁽²⁾ , sec | 5.0 | >300 |
| Elmendorf Tear ⁽³⁾ , 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/yd²) (25.5 g/m²)] 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/yd²) (25.5 g/m²)]

| 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:

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

Table 2: Comparison of Kawabata and Hand Panel Softness Values⁽¹⁾ for 100% Polypropylene Nonwoven [(0.75 oz/yd²) (25.5 g/m²)]

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

(1) 1 = Softest, 10 = Harshesht, 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

Standard copy to come

Product Safety, Handling and Storage

Standard copy to come

Limitations

Standard copy to come

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