



ALWAYS ONE  
STEP AHEAD

# POLYURETHANE ADDITIVES GUIDE

FLEXIBLE SLABSTOCK FOAM



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## A LEADER IN POLYURETHANE ADDITIVES

Momentive Performance Materials offers one of the most trusted and diverse polyurethane additive product lines in the industry, ranging from a broad array of silicone stabilizers and a full portfolio of amine and metal-based catalysts to a selection of organic-based property modifiers.

Developed in 1962, Niax™ brand additives have long been essential ingredients in polyurethane formulations used to meet the specialized processing and performance needs of customers across the globe. Niax grades include a comprehensive line of silicones, catalysts, and process modifiers for polyurethane foam production. Momentive also offers GeoCell™ additives and foam solutions designed for the Mattress in a Box market and Geolite™ modifiers to help flexible slabstock foam producers broaden their offering of foam grades.

Momentive is a pioneer in the polyurethanes additives industry and continues to serve customers with leading innovations, creative solutions, and excellent application expertise.

## POLYURETHANE ADDITIVES FOR FLEXIBLE SLABSTOCK APPLICATION

Polyurethane slabstock foams are used in a variety of sectors including furniture & bedding, medical, automotive, and specialty applications.

| SILICONES  | CATALYSTS  | PROCESS MODIFIERS   |
|--|--|---|
|  <ul style="list-style-type: none"> <li>• Conventional</li> <li>• Universal</li> <li>• High-Resilience</li> <li>• Viscoelastic</li> <li>• Polyester</li> <li>• Specialty</li> </ul> |  <ul style="list-style-type: none"> <li>• General Amine</li> <li>• Metal</li> <li>• Low-Emission Amine</li> </ul> |  <ul style="list-style-type: none"> <li>• Antioxidant</li> <li>• Antistatic</li> <li>• Color Pastes</li> <li>• Flame Lamination</li> <li>• Foam Hardeners</li> </ul> |

## POLYURETHANE ADDITIVES GUIDE

### The Role of Silicone Surfactants in Polyurethane Foam:

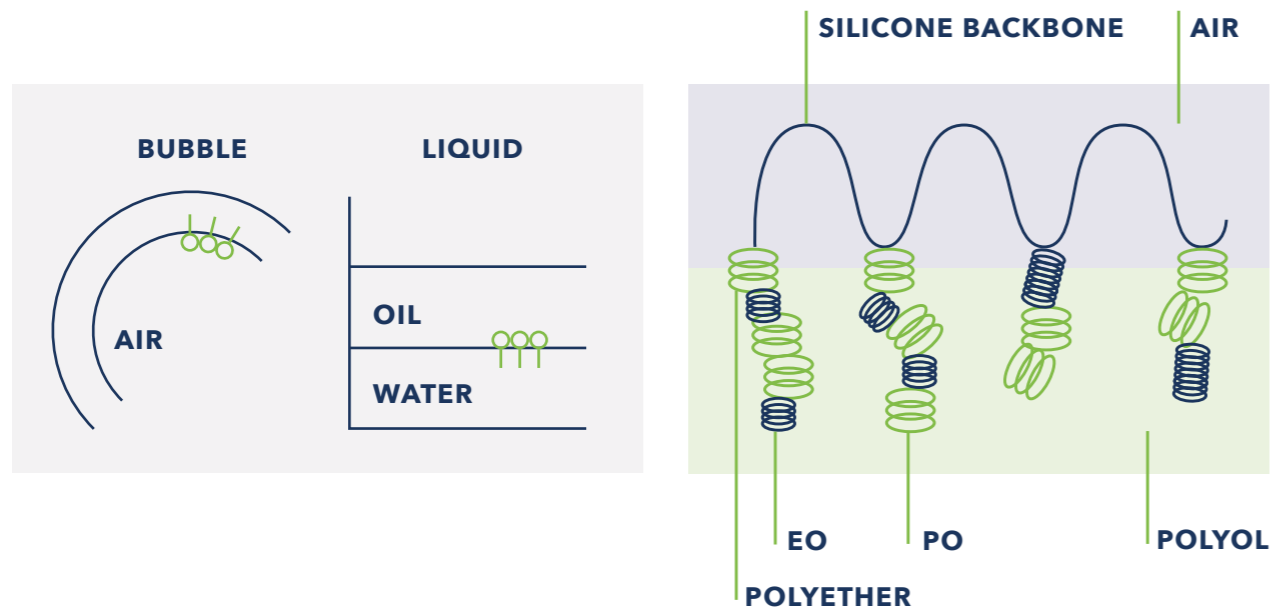
- ✓ Improve reaction mix compatibility, widen formulation selection, and process latitude
- ✓ Provide bulk foam stabilization to prevent phase separation and collapse
- ✓ Regulate cell size and cell opening. Affect dimensional stability, comfort, elasticity, and viscoelastic behavior
- ✓ Enhance physical properties and improve fire behavior

Momentive has designed a full range of high-performing standard, universal, and specialty silicones for the production of flexible polyurethane slabstock foam, that allow foam producers to tailor solutions to customers, and to offer a broad variety of foam grades.



### The Surfactant Acts at the Interface of Poorly Compatible Formulation Components:

- The silicone backbone has an affinity for hydrophobic/non-polar materials
- The polyether pendants are drawn towards more hydrophilic/polar materials



## NIAX/GEOCELL CONVENTIONAL SILICONES

| Product        | Low-Emission | Efficiency  | Liquid CO <sub>2</sub> | Hydrolytic Stability | Regional Availability | Typical Benefits   |
|----------------|--------------|-------------|------------------------|----------------------|-----------------------|--|
| Niax L-895     | □            | High        | •                      |                      | ●                     | Higher foam block and improved foam yield  |
| Niax L-595LE   | □            | High        | •                      |                      | ●                     | Optimized block height and foam yield  |
| Niax L-595LO   | □            | High        | •                      |                      | ●                     | Low-odor, optimized block height and foam yield  |
| Niax L-580LE   | □            | Medium-High | •                      | •                    | ●                     | Effective performance in low-density and/or filled formulations  |
| Niax L-894     | □            | Medium      | •                      |                      | ●                     | Improved side and top skin, very good foam physical property distribution                              |
| GeoCell L-882  | □            | Medium      | •                      | •                    | ●                     | Wide processing latitude, general-purpose use  |
| GeoCell L-884  | □            | Medium      | •                      | •                    | ●                     | Very wide processing latitude, general-purpose silicone with improved recovery after compression       |
| Niax L-854     | □            | Low-Medium  | •                      |                      | ●                     | Wide processing, yielding fine and regular cells with improved foam porosity                           |
| Niax L-633     |              | Very High   |                        |                      | ●                     | Effective performance in ultra-low-density foam formulations   |
| Niax L-570     |              | High        | •                      |                      | ●●                    | Effective performance with low-density foams that use inorganic filler and/or auxiliary blowing agents |
| Niax L-595     |              | High        | •                      |                      | ●                     | Higher foam block and improved foam yield  |
| Niax L-580     |              | Medium-High | •                      | •                    | ●                     | Effective performance in low-density formulations, water premix stability                              |
| Niax L-580LO   |              | Medium-High | •                      | •                    | ●                     | Effective performance in low-density and/or filled formulations  |
| Niax L-594Plus |              | Medium      | •                      |                      | ●                     | Improved side and top skin, very good foam physical property distribution                              |
| Niax L-540     |              | Medium      | •                      |                      | ●●                    | General-purpose; effective performance in low to medium density formulations                           |
| Niax SC-240    |              | Medium      | •                      | •                    | ●                     | Wide processing latitude, general-purpose, premix-stable   |

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## NIAX UNIVERSAL SILICONES



## NIAX/GEOCELL SILICONES FOR VISCOELASTIC FOAM



| Niax  | Low-Emission | Efficiency  | CO <sub>2</sub> Blown Foams | Hydrolytic Stability | Regional Availability | Typical Benefits  |
|-------|--------------|-------------|-----------------------------|----------------------|-----------------------|---|
| L-820 | □            | Medium-High |                             |                      | ●                     | Wide processing with medium FR performance  |
| L-850 | □            | Medium      | •                           |                      | ●                     | Outstanding FR performance in flame lamination and FR foam formulations               |
| L-855 | □            | Medium      |                             |                      | ●                     | Exceptional FR property, fine cells with minimal required liquid flame retardant      |
| L-835 | □            | Medium      | •                           |                      | ●                     | Fine cells in liquid CO <sub>2</sub>  |
| L-818 | □            | Medium      |                             |                      | ●                     | Wide processing with medium FR performance  |
| L-819 | □            | Medium      |                             |                      | ●                     | Wide processing with medium FR performance, suitable for MDI visco foam               |
| L-620 |              | Medium-High |                             |                      | ●                     | Wide processing with medium FR performance  |
| L-690 |              | Medium-High |                             | •                    | ●                     | Medium FR performance silicone, broad effectiveness in activator blends               |
| L-616 |              | Medium      |                             |                      | ●●                    | Wide processing with medium FR performance and enhanced stabilization characteristics |
| L-618 |              | Medium      |                             |                      | ●                     | Wide processing with medium FR performance  |
| L-638 |              | Medium      | •                           |                      | ●                     | Wide processing in conventional and FR slabstock formulations                         |
| L-680 |              | Low-Medium  |                             | •                    | ●                     | Medium FR performance silicone, broad effectiveness with activator blends             |
| L-668 |              | Low-Medium  |                             |                      | ●                     | Wide processing in high-density and viscoelastic formulations                         |

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| Product       | Low-Emission | Cell Opening | TDI | MDI | Pneumatic | Regional Availability | Typical Benefits  |
|---------------|--------------|--------------|-----|-----|-----------|-----------------------|---|
| Niax L-629LE2 | □            | •            | •   | •   |           | ●                     | Low-emission, low-viscosity cell-opening with TDI viscoelastic foams                                  |
| Niax L-417    | □            |              |     | •   | •         | ●                     | Low-emission, fine cell structure, and good mechanical properties with MDI based pneumatic visco foam |
| Niax L-838    | □            |              | •   | •   |           | ●                     | Low-potency, optimum cell size and air flow control with both TDI and MDI based systems               |
| Niax L-418    |              |              |     | •   | •         | ●                     | Fine cell structure and good mechanical properties with MDI based pneumatic visco foam                |
| Niax L-627    |              |              | •   | •   |           | ●                     | Low-viscosity cell-opening silicone with TDI viscoelastic foam  |

## NIAX SILICONES FOR HIGH-RESILIENCE FOAM



| Niax   | Low-Emission | General-Purpose | High-Density | TDI/MDI | Regional Availability | Typical Benefits   |
|--------|--------------|-----------------|--------------|---------|-----------------------|--|
| L-2112 | □            | •               | •            | •       | ●                     | Universal silicone; wide processing and medium efficiency  |
| L-2113 | □            | •               | •            | •       | ●                     | Universal silicone formulated with natural source raw materials; wide processing and low-medium efficiency |
| L-2106 | □            | •               |              | •       | ●                     | General-purpose surfactant; low-emission   |
| L-3684 | □            | •               |              | •       | ●                     | General-purpose surfactant; low-emission   |
| L-3685 | □            | •               | •            | •       | ●                     | General-purpose surfactant; improved processing latitude and low-emission                                  |
| U-2000 |              | •               |              | •       | ●                     | General-purpose surfactant; wide processing  |
| L-2166 |              | •               |              | •       | ●                     | Effective performance with PHD and SAN systems   |
| L-5333 |              | •               | •            | •       | ●                     | Wide processing, enablement of easy-to-crush effect, and improved stability                                |

## NIAX SURFACTANTS FOR POLYESTER FOAM



| Niax      | Low-Emission | Efficiency  | FR Property | Cell Structure | Regional Availability | Typical Benefits  |
|-----------|--------------|-------------|-------------|----------------|-----------------------|---|
| SE-232    | ■            | High        |             | Regular        | ●                     | General-purpose silicone surfactant   |
| Y-16455   | ■            | High        | •           | Regular        | ●                     | Low-odor silicone surfactant combining high-efficiency, flame retardancy, and cell structure control                                  |
| L-530     | ■            | High-Medium |             | Regular        | ●                     | Low-odor universal silicone surfactant  |
| L-537XF   | ■            | Medium      |             | Fine           | ●                     | Universal silicone; promotion of fine and open-cell structure   |
| Y-16435   | ■            | Low         | •           | Very Fine      | ●                     | Low-odor silicone surfactant with good balance of efficiency, flame retardancy, and fine cell structure for improved foam quality     |
| L-553NPF  | ■            | Low         |             | Fine           | ●                     | Silicone surfactant; promotion of fine cells  |
| B-320NPF  |              | High        |             | Coarse         | ●                     | Silicone surfactant; promotion of fine and uniform cells over a wide density range; formulated without nonylphenol                    |
| B-325NPF  |              | Low-Medium  |             | Regular        | ●                     | Silicone surfactant; promotion of fine and uniform cells over a wide density range; formulated without nonylphenol                    |
| B-350NPF  |              | Medium      |             | Regular        | ●                     | Silicone surfactant; promotion of fine and uniform cells over a wide density range; formulated without nonylphenol                    |
| ES-1058   |              | n.a.        | •           | Coarse         | ●                     | Organic surfactant; effective performance with medium to high density foam  |
| A-2420    |              | n.a.        | •           | Fine           | ●                     | Organic surfactant with emulsifying properties  |
| M-6682NPF |              | n.a.        | •           | Fine           | ●                     | Organic surfactant; effective performance with die-cuttable and FR ester foams of medium-high density; formulated without nonylphenol |

## NIAX SILICONES FOR SPECIALTY APPLICATIONS



| Niax     | Regional Availability | Typical Benefits  |
|----------|-----------------------|---|
| L-636LE2 | ●                     | Low-emission silicone; effective performance with gasketing and sealing applications  |
| L-422    | ●                     | Low-emission silicone; super-soft, open-cell with MDI foam  |
| L-450    | ●                     | Low-emission; cell regulation as co-surfactant with conventional, HR and viscoelastic foam, improved recovery after compression   |
| L-500    | ●                     | Low-emission additive; cell regulation with viscoelastic MDI foam. Improved dimensional stability of HR/CMHR foams  |
| L-410    | ●                     | Foam hardener offering enhanced hardness to conventional TDI-based foam   |
| L-435    | ●                     | Low-emission foam hardener offering enhanced hardness to conventional TDI-based foam  |
| L-670    | ●                     | Medium-potency, enhanced processing and physical properties in flexible slabstock foam operations that use natural oil polyol; can be used for CO <sub>2</sub> processing |

## GEOLITE/ GEOCELL MODIFIERS

The Geolite / GeoCell Modifiers product family comprises various processing aid additives that are typically used to eliminate or substantially reduce the use of auxiliary blowing agents. Furthermore, these modifiers can allow foam producers to improve on the foam quality and physical property distribution whenever special foaming conditions are applied.

| Product                 | Regional Availability | Typical Benefits   |
|-------------------------|-----------------------|--|
| Geolite Modifier 91     | ●                     | Processing aid additive, improved foam quality and reduced risk of splits with critical formulations   |
| Geolite Modifier 206    | ●                     | Additive enabling safe processing with soft foam grades at 90-100 TDI index  |
| Geolite Modifier 210    | ●                     | Chemical stabilizer; enhanced softening with low-index formulations  |
| GeoCell Additive GM-225 | ●                     | Processing aid additive minimizing density and hardness gradients; providing additional stability  |
| GeoCell Additive GM-280 | ●                     | Low-fogging, stabilizing additive offering rectangular block shape for high-resilience and high-density conventional and viscoelastic foam; enhanced foam curing |

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## NIAX/GEOCELL PROCESS MODIFIERS

Our process and foam modifiers offer enhancement of existing material processes properties. From improved adhesion and reduced discoloration, to increased load-bearing and more, Momentive process and foam modifiers can be easily incorporated into current manufacturing processes.

| Product               | Regional Availability | Typical Benefits   |
|-----------------------|-----------------------|--|
| <b>Niax DP-1022</b>   | ●                     | Processing aid additive, may improve mechanical properties in filled foams   |
| <b>Niax FH-350</b>    | ●                     | Foam hardener additive, improved tear, tensile, and elongation properties  |
| <b>Niax FH-450</b>    | ●                     | Foam hardener additive, blendability with polyether polyol   |
| <b>GeoCell FH-700</b> | ●                     | Additive acting as a load builder and increasing foam hardness in high-resilience slabstock application; enhanced foam curing                    |
| <b>Niax AT-38</b>     | ●                     | Antistatic additive; effective performance with conventional slabstock foam  |
| <b>Niax CS-11</b>     | ●                     | High-performance antioxidant with good process tolerance and improved VOC characteristics  |
| <b>Niax CS-14</b>     | ●                     | High-performance antioxidant minimizing foam scorching with polyether foam   |
| <b>Niax CS-15</b>     | ●*                    | Antioxidant; effective performance with low-density polyether foam   |
| <b>Niax CS-16</b>     | ●                     | Antioxidant; improved anti-UV yellowing properties with polyether foam   |
| <b>Niax CS-20LF</b>   | ●                     | Additive for flame and heat lamination; enhanced adhesion properties, suitable for textile and automotive applications                           |
| <b>Niax CS-22LF</b>   | ●                     | Additive for flame and heat lamination; improved indirect light stability with polyether and polyester foams                                     |
| <b>Niax CS-25LF</b>   | ●                     | Additive for flame and heat lamination with improved processing latitude and indirect light stability suitable for polyether and polyester foams |
| <b>Niax FLE-200LF</b> | ●                     | Flame lamination additive; improved bonding properties with flame lamination foam  |
| <b>Niax FLE-500LF</b> | ●                     | Flame lamination additive; improved bonding properties with flame lamination foam  |
| <b>Niax SC-300</b>    | ●                     | Additive for polyether sea sponge foam   |
| <b>Niax DCF</b>       | ●                     | Improved clickability and foam recovery after compression in polyester foam  |

\*All regions except Europe

## NIAX AMINE CATALYSTS

| Niax              | Low-Emission | Blow | Balanced | Gel | Polyester Foam | Regional Availability | Typical Benefits  |
|-------------------|--------------|------|----------|-----|----------------|-----------------------|---|
| <b>EF-100S</b>    | □            | •    |          |     | •              | ●                     | Low-viscosity, high-efficiency reactive blow catalyst                                 |
| <b>EF-350</b>     | □            | •    | •        |     |                | ●                     | Low-viscosity, high-potency balanced catalyst   |
| <b>EF-600S</b>    | □            |      | •        | •   |                | ●                     | Low-emission gel catalyst, may reduce foam smell                                      |
| <b>EF-700</b>     | □            | •    | •        |     |                | ●                     | Low-emission blow catalyst, may reduce foam smell                                     |
| <b>EF-867</b>     | □            |      | •        |     |                | ●                     | Low-emission balanced catalyst, may reduce foam smell                                 |
| <b>A-30NPF</b>    |              | •    |          |     | •              | ●                     | High-efficiency, low-odor blow catalyst; nonylphenol-free formulation                 |
| <b>B-9NPF</b>     |              |      | •        |     | •              | ●                     | High-efficiency, low-odor balanced catalyst, nonylphenol-free formulation             |
| <b>C-131NPF</b>   |              | •    |          |     | •              | ●                     | Blow catalyst for low-fogging polyester foam; nonylphenol-free formulation            |
| <b>KST-100NPF</b> |              |      | •        |     | •              | ●                     | Balanced catalyst for low-fogging polyester foam; nonyl-phenol-free formulation       |
| <b>A-1_S</b>      |              | •    |          |     |                | ●                     | High-efficiency blow catalyst   |
| <b>A-133</b>      |              | •    |          |     |                | ●                     | Dilution of A-1 for easy metering   |
| <b>A-230</b>      |              |      | •        |     |                | ●●                    | Balanced catalyst, optimum performance with square blocks, Flat top or Maxfoam system |
| <b>A-33</b>       |              |      |          | •   |                | ●                     | Gel catalyst  |
| <b>B-18</b>       |              |      | •        |     |                | ●                     | Balanced catalyst; extended cream time for Maxfoam process                            |

## NIAX/GEOCELL METAL CATALYSTS

| Product                | Regional Availability | Typical Benefits                                      |
|------------------------|-----------------------|---|
| <b>Niax Sn Octoate</b> | ●                     | Stannous Octoate                                      |
| <b>GeoCell D-10</b>    | ●                     | Lower viscosity Sn Neodecanoate for improved metering |
| <b>GeoCell D-25</b>    | ●                     | Sn Neodecanoate                                       |
| <b>GeoCell D-26</b>    | ●                     | Sn Neodecanoate                                       |

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