



ALWAYS ONE
STEP AHEAD

POLYURETHANE ADDITIVES FOR
MATTRESS IN A BOX FOAMS



LEADER IN POLYURETHANE ADDITIVES

Momentive's broad range of Niax™ additives can enable the latest production and performance requirements of polyurethane foams used in Mattress in a Box. **GeoCell™** is the new Momentive line of additives and foam solutions designed for the Mattress in a Box market. Our additives contribute to the ultimate foam solution that can mean a deep restful sleep for your consumers.

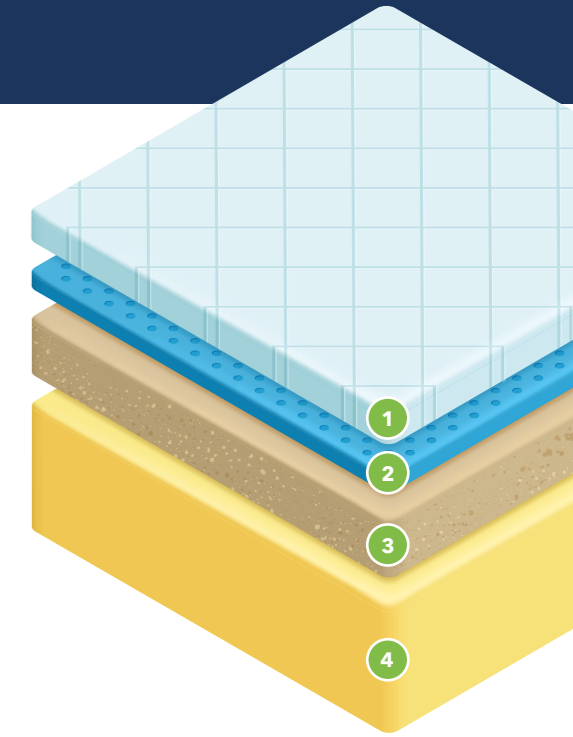
Innovative and cost-effective foam production depends largely upon selecting the right surfactants, catalysts, and other additives. In support of your success, Momentive has a team of experts available with the technical know-how to help solve your production challenges, or we can craft Niax additives solutions tailored to your unique foam needs.



MATTRESS IN A BOX FOAM LAYERS AND RECOMMENDED NIAAX ADDITIVES

Momentive's GeoCell line of additives are specifically designed to bring value to each and every foam layer.

- 1 **Supersoft**
- 2 **Viscoelastic**
- 3 **High-Resilience (HR)**
- 4 **Conventional**



MATTRESS IN A BOX VALUE CHAIN NEEDS

At Momentive, we understand the challenges of the Mattress In a Box foam process and packaging. The process of compressing, folding, and rolling the foam demands better foam properties. Our GeoCell line of additives and foam solutions can help the foamer address these challenges.

FOAM MANUFACTURER

- Improved air flow
- Minimized density and hardness gradients from top to bottom
- Lower glass transition temperature
- Lower emission surfactants
- Better tensile, tear, elongation
- Wider processing latitude



MATTRESS IN A BOX MANUFACTURER

- Consistent temperature management
- Improved pressure point support
- Consistent feel over full night's rest
- No odor
- Improved foam durability
- Improved foam recovery



CUSTOMER

- Deep restful sleep



Foam Type	Niix/ GeoCell Surfactants	Niix Catalysts	GeoCell/ Geolite Additives	Surfactant Performance Comments
 Supersoft	L-895 L-838 L-422	EF-600S EF-700 EF-100S	GM-206 GM-225	L-895: Lower emission, higher efficiency resulting in higher foam yields L-838: Lower emission, broad processing latitude, supersoft, open foam, silky feel L-422: Lower emission for MDI-based supersoft foam, good stabilization, very open foam
 HR Foam	L-3684 L-3685 L-2112	EF-600S EF-700 EF-100S	GM-280	L-2112, L-3684, L-3685: Lower emission, wide processing latitude
 Visco - Open Cell	L-894 L-417 L-818 L-819 L-820	EF-600S EF-700 EF-100S	GM-206 GM-280	L-894: Lower emission, wide processing latitude, medium-potency L-417: Lower emission co-surfactant, fine cell structure L-818/L-819 and L-820: Lower emission, wide processing latitude, open foam
 Visco - Pneumatic	L-417	EF-600S EF-700 EF-100S		L-417: Lower emission, fine cell structure, excellent mechanical properties
 Conventional	L-894 L-884	EF-600S EF-700 EF-100S	GM-206 GM-225	L-894: Lower emission, wide processing latitude, medium-potency, open foam L-884: Lower emission, very wide processing latitude, medium-potency, open foam

SURFACTANTS

Polyurethane foams used in Mattress in a Box rely heavily on the use of specialized raw materials. By using a silicone surfactant, you can achieve desired foam properties using standard, readily available raw materials. Silicone surfactants are crucial for foam stabilization. They can control cell structure and foam openness, as well as help define final foam properties.

NIAX SILICONE L-417

Considering the unique foam needs of Mattress in a Box manufacturers, Niaux silicone L-417 is an excellent candidate for production of specialized MDI and MDI/TDI viscoelastic foams.

KEY FEATURES & TYPICAL BENEFITS

Control of pneumatic effect

- Precise control of pneumatic effect can enable the use of low T_g polyol systems without any negative impact on viscoelastic properties of the mattress foam
- Outstanding viscoelastic recovery of foam at wider temperature ranges

Wider processing latitudes and compatibility with standard polyols

- Compatible with readily available raw materials, such as conventional and high ethylene oxide polyether polyols for producing specialty foam grades
- Desired foam properties can typically be achieved by adjusting water level, Niaux silicone L-417 concentration, and isocyanate index
- No need for specialty raw materials, custom production equipment, and highly controlled ambient conditions

Minimized odor, emissions, and off-gassing

- Hydrolytically stable and low-emission characteristics, which are key influencing factors in mattress design and consumer purchase decisions

NIAX SILICONE L-894

Conventional foams play an important role in providing cradle support for the top layers of a Mattress in a Box. It is crucial for this layer to provide uniform and consistent load support. Well-balanced conventional foam enables superior structural design of Mattress in a Box products.

Niaux silicone L-894 provides good stability, fine cell structure and can enable enhanced cell-opening characteristics, which can improve air flow uniformity.

KEY FEATURES & TYPICAL BENEFITS

Balanced potency silicone stabilizer

- Promotes well-balanced foam processing to yield fine, regular cells, and good property distribution
- Provides optimal balance of foam stabilization and foam openness over a broad range of foam densities
- Compatible with CO₂
- Wider processing latitudes and compatibility with standard polyols
- Compatible with readily available raw materials
- Improved productivity in the manufacturing of conventional foams in Mattress in a Box without compromising on quality

Minimized odor, emissions, and off-gassing

- Removing low molecular weight and non-reactive components from the surfactant chemical composition helps enable the low-emission characteristics, which are key influencing factors in the consumer purchase decision process

Good top and side skin quality

- Excellent foaming stability and processing latitude offered by the surfactant supports yield of good top and side skin quality
- Offers reduced scrap rate and improved output from foam batch
- Momentive's specialists are available to understand your specific foam manufacturing needs and recommend the best specialty additive from our extended portfolio

GEOCELL SILICONE L-884

Conventional foams play an important role in providing cradle support for the top layers of a Mattress in a Box. It is crucial for this layer to provide uniform and consistent load support. Well-balanced conventional foam enables superior structural design of Mattress in a Box products.

GeoCell silicone L-884 provides good stability, fine cell structure and very wide processing latitude characteristics in combination with good foam breathability.

KEY FEATURES & TYPICAL BENEFITS

Balanced potency silicone stabilizer

- Medium-potency with good cell stabilization properties for enlarged processing characteristics
- Suitable for compressed and vacuumized foam application, also Mattress in Box
- Suitable for liquid CO₂ process, providing fine cell structure
- Stable in water-amine pre-blends
- Suitable for all types of foaming machines, both low and high pressure

Minimized odor, emissions, and off-gassing

- Removing low molecular weight and non-reactive components from the surfactant chemical composition helps enable the low-emission characteristics, which are key influencing factors in the consumer purchase decision process

Good compression set and recovery after compression

- Excellent compression set characteristics also in low-density conventional foam, supporting enhanced foam recovery properties after compression

ADDITIONAL SURFACTANT RECOMMENDATIONS

NIAX SILICONE L-895

- High-potency, lower emission silicone surfactant
- Demonstrated outstanding performance for low-density foams
- CO₂ compatible

NIAX SILICONE L-629LE2

- Cell-opening, lower emission silicone surfactant for TDI viscoelastic foams

NIAX SILICONE L-800

- Medium-potency silicone surfactant
- Provides an optimized balance of cell-opening capabilities and foam stabilization
- Wide processing latitude
- Medium FR efficiency
- Low cyclic content provides reduced VOCs
- Excellent candidate for a variety of foam applications and grades:
 - **Viscoelastic** foam applications > both TDI and MDI
 - **Conventional** foam applications > wide range of grades
 - **FR polyether** foam applications

NIAX SILICONE L-818

- Medium-potency, lower emission silicone surfactant
- Recommended for conventional and viscoelastic foams
- Medium FR properties

NIAX SILICONE L-838

- Low-potency, lower emission silicone surfactant
- Excellent candidate for high-density foams
- CO₂ compatible
- Cell-opening co-surfactant for MDI and TDI viscoelastic foams

CATALYSTS

NIAX CATALYST EF-700

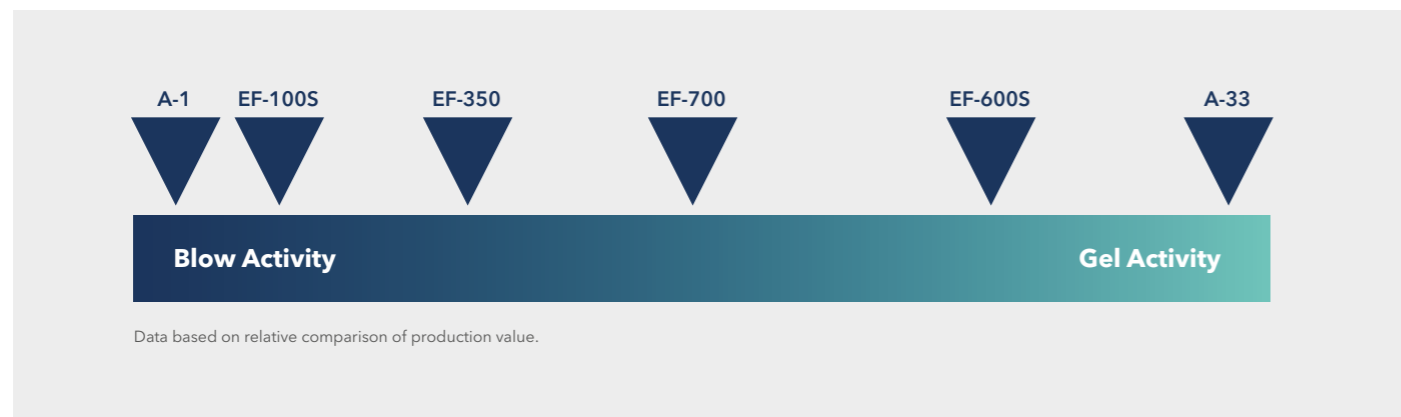
Amine catalysts play a pivotal role in the manufacturing of polyurethane foam. A quality foam is only made possible by proper catalysis that helps support the chemical formulation and manufacturing conditions.

In addition to comfort, manufacturers and end-users are consciously focusing on reduced emissions from mattress foams. Niaux catalyst EF-700 can replace conventional volatile amines when emissions and odor need to be reduced in the foaming process.

KEY FEATURES & TYPICAL BENEFITS

Designed to control cream and rise time during the foam production and to minimize amine emissions

- Reduced emissions from the mattress are a key influencing factor in consumers purchase decisions
- Balanced catalyst that can be used as the sole amine catalyst in certain formulations



GEOCELL CATALYST D-25

Momentive's new 2-EHA free stannous (II) based catalyst with strong gelling characteristics.

KEY FEATURES & TYPICAL BENEFITS

- Comparable use level with stannous octoate across a wide range of foam formulations
- Free from 2-ethylhexanoic acid
- Medium viscosity, easy-to-meter
- Standard FR characteristics
- Excellent solubility in polyether polyol and most organic solvents
- Stored and handled using same conditions as stannous octoate



ADDITIONAL ADDITIVE RECOMMENDATIONS

GEOHITE MODIFIER 206

- Processing aid for enhanced stability, improved density and ILD gradients

GEOCELL ADDITIVE GM-280

- Processing additive that offers excellent foam processing latitude and enhances dimensional stability
- Prevents/reduces cold flow, improves foam curing, and reduces density and hardness gradients in foam block

GEOCELL ADDITIVE GM-225

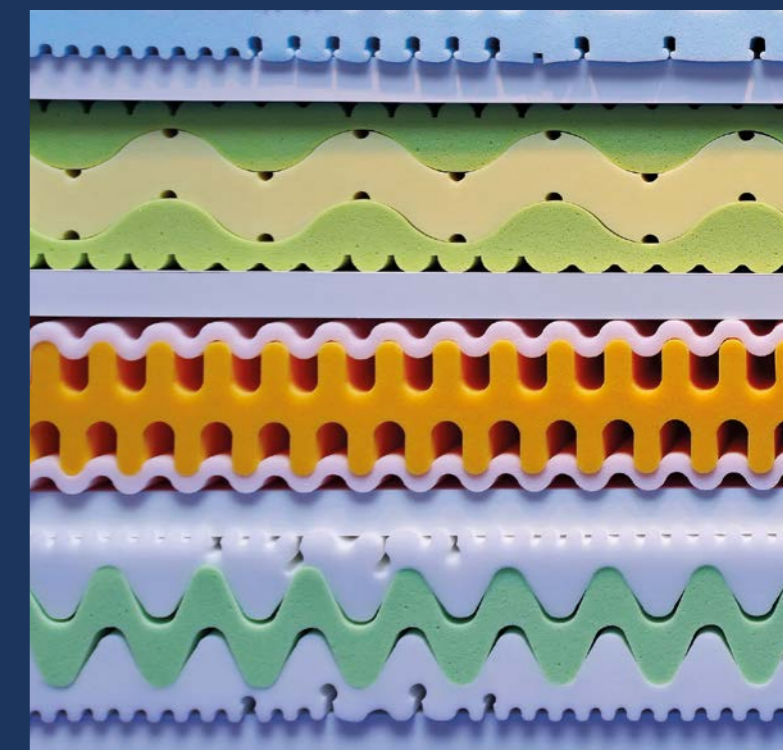
- Processing additive minimizing density and hardness gradients
- Wider processing latitude for improved processability

MOMENTIVE'S GEOCELL LINE OF ADDITIVES & FOAM SOLUTIONS

Our extensive experience and technical know-how of PU additives offers innovative advantages to foam and Mattress in a Box manufacturers.

Momentive's technology experts are excited to closely collaborate and develop a custom foam formulation meeting your stringent and specific requirements.

In-depth knowledge of surfactants, catalysts, modifiers and their compatibility with MDIs, TDIs, and polyols help you push the boundaries of product innovation.



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