NIAX™ ADDITIVES BY MOMENTIVE

ALWAYS ONE STEP AHEAD

POLYURETHANE ADDITIVES FOR

MATTRESS IN A BOX FOAMS

MOMENTIVE®

LEADER IN POLYURETHANE ADDITIVES

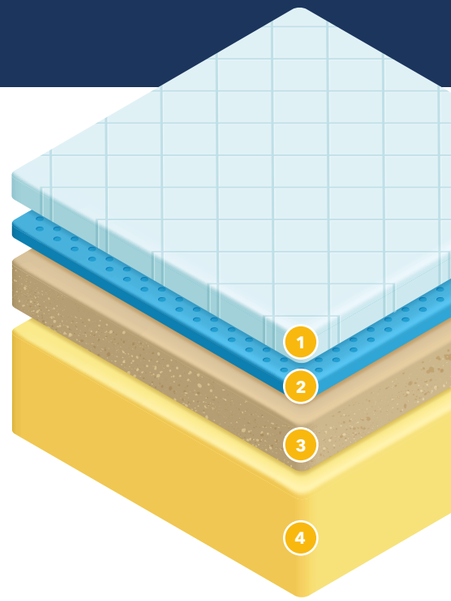
Momentive's broad range of Niax™ additives can enable the latest production and performance requirements of polyurethane foams used in Mattress in a Box. **GeoCell™** is our new line of Niax additives and foam solutions designed for the Mattress in a Box market. Our additives contribute to the ultimate 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 NIAX 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 Niax additives and foam solutions can help the foamer to address this challenge.

FOAM MANUFACTURER

- Improved air flow
- Minimize density and ILD 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 rest
- No odor
- Improved foam durability
- Improved foam recovery

CUSTOMER

- Deep restful sleep

Foam Type	Momentive Surfactants	Momentive Catalysts	Momentive Additives	Surfactant Performance Comments
Supersoft	L-895 L-838	EF-600S EF-700 EF-100S	GM-206	**L-895:** Lower emission, higher efficiency resulting in higher foam yields. **L-838:** Lower emission, broad processing latitude, supersoft, open foam, silky feel.
HR Foam	L-3684 L-3685	EF-600S EF-700 EF-100S	GM-206	**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	**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	GM-206	**L-417:** Lower emission, fine cell structure, excellent mechanical properties.
Conventional	L-894	EF-600S EF-700 EF-100S	GM-206	**L-894:** Lower emission, 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, Niax Silicone L-417 is an excellent candidate for production of specialized MDI and TDI viscoelastic foam.

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, Niax silicone L-417 concentration and isocyanate index
- Avoids need for specialty raw materials, custom production equipment and highly controlled ambient conditions

Minimizes odor, emissions and off-gassing

- Hydrolytically stable and presents 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.

Niax 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 CO_2
- Wider processing latitudes and compatibility with standard polyols
- Compatible with readily available raw materials
- Improved productivity in production of conventional foams in Mattress in a Box without compromising on quality

Minimizes 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

In addition to our featured offerings, Momentive specialists are available to understand your specific foam manufacturing needs and recommend the best specialty additive from our extended portfolio.

ADDITIONAL SURFACTANT RECOMMENDATIONS

NIAX SILICONE L-895

- High potency, lower emission silicone surfactant
- Demonstrated outstanding performance for low density foams
- CO_2 compatible

NIAX SILICONE L-818

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

NIAX SILICONE Y-16420

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

NIAX SILICONE L-838

- Low potency, lower emission silicone surfactant
- Excellent candidate for high density foams
- CO_2 compatible
- Cell-opening co-surfactant for MDI and 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 reduce VOCs
- Suitable for use in 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

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 help support the chemical formulation and manufacturing conditions.

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

KEY FEATURES & TYPICAL BENEFITS

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

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

Data based on relative comparison of production value.

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

GEOLITE™ MODIFIER 206

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

GEOCELL ADDITIVE GM-280

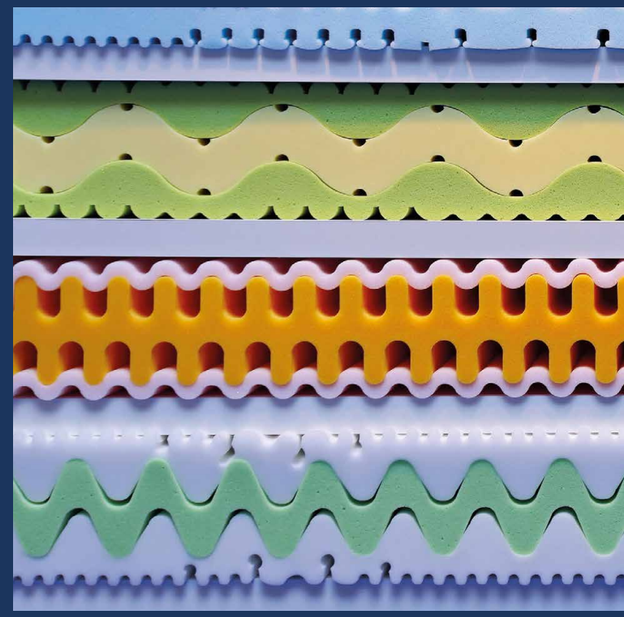
- Processing additive that offers **excellent foam processing latitude and enhances dimensional stability**
- Prevents / reduces **cold flow, improves foam curing and reduces density and hardness gradients in foam block**

MOMENTIVE'S GEOCELL LINE OF NIAX 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.



NIAX ADDITIVES

CUSTOMER SERVICE CENTERS

AMERICAS
+1 800 295 2392 Toll free*
+ 704 805 6946 Direct Number

LATIN AMERICA

BRAZIL
+55 11 4534 9650 Direct Number

MEXICO
+52 55 2169 7670 Direct Number

*All American countries

EMEAI- EUROPE, MIDDLE EAST, AFRICA & INDIA

EUROPE
+ 390510924300 Direct number

INDIA, MIDDLE EAST & AFRICA
+ 91 44 71212207 Direct number*

*All Middle Eastern countries, Africa, India, Pakistan, Bangladesh, Sri Lanka.

ASIA PACIFIC

CHINA
800 820 0202 Toll free
+86 21 3860 4892 Direct number

JAPAN
+81 3 5544 3111 Direct number

KOREA
+82 2 6201 4600 Direct number

SOUTH EAST ASIA, AUSTRALIA & NEW ZEALAND
+60 3 9206 1543 Direct number*

*South East Asia countries (Malaysia, Singapore, Thailand, Indonesia, Vietnam, Philippines, Cambodia, Myanmar / other countries located in Pacific region).

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