

# Geolite<sup>\*</sup> Modifier 210

## Product Description

Geolite modifier 210 is a stabilizing additive whose technology offers a novel way to fully eliminate or dramatically reduce the use of auxiliary blowing agents (ABAs) in many grades of conventional slabstock foam.

Like our earlier Geolite products, this technology is based on the principle of lowering the hardness of foam by reducing isocyanate index. This permits the use of higher water and lower blowing agent levels to achieve desired foam hardness.

The use of Geolite modifier 210 facilitates the production of numerous foam grades at very low indices (down to about 85), while maintaining acceptable physical properties and processing latitude. The addition of Geolite modifier 210, or its sister product Geolite modifier 205, is necessary for the production of such low-index foams.

Relative to Geolite modifier 205, foams made using Geolite modifier 210 should reduce more ABA, be softer, possess improved "hand", and exhibit compression set improvements over other additives and technologies used to reduce consumption of ABAs. Geolite modifier 210 also allows the manufacture of foams possessing greater air flow. Therefore, it may offer greater processing latitude, depending on foaming equipment. A consequence of this may be the need for slightly higher concentrations of tin catalyst.

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Momentive Performance Materials provides versatile materials as the starting point for our creative approach to ideas that help enable new developments across hundreds of industrial and consumer applications. We are helping customers

solve product, process, and performance problems; our silanes, fluids, elastomers, sealants, resins, adhesives, urethane additives, and other specialty products are delivering innovation in everything from car engines to biomedical devices.

From helping to develop safer tires and keeping electronics cooler, to improving the feel of lipstick and ensuring the reliability of adhesives, our technologies and enabling solutions are at the frontline of innovation.



## Geolite\* Modifier 210

### Key Features and Typical Benefits

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- Requires no major capital investment
- Uses existing urethane raw materials
- Provides stability for use at isocyanate index as low as 85
- Yields softer foam over previous Geolite products, giving improved processing
- Often eliminates all ABAs
- Good properties in most grades, comparable to conventional foam
- Best processability of all currently available soft foam technologies
- Useful with varied processing technologies, including mechanical cooling
- Plant operational in one to two days
- Reduces amine and tin catalyst levels

### Typical Physical Properties

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Physical Form	Liquid
Specific Gravity at 25°C	1.115
Weight per Gallon at 25°C (77°F), lb (kg)	9.27 (4.20)
Viscosity at 25°C (77°F), cSt	78
Freezing Point, °C (°F)	< -35 (-31)
Vapor Pressure at 20°C (68°F), mm Hg	> 1
Coefficient of Expansion at 55°C (130°F), per °C	0.00071
Flash Point °C (°F)	47 (116)
Boiling Point, °C (°F)	> 100 (212)
Solubility in Water at 20°C (68°F)	Complete
Water Content, % by wt	22.4
TDI/Geolite Modifier 210 Ratio	2.84/1
Hydroxyl Number (with water), mg KOH/g	1835

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## Foam Properties

Using this technology with low-index, high-water formulations yields foam with improved physical properties – near those obtained in conventional, lower water, ABA-based systems. In certain cases, with mechanical cooling processes, for example, this technology leads to foams with vastly improved physical properties, including compression sets. Moreover, this technology allows the production of soft, ABA-free foams of many densities. Soft foams with densities ranging from less than 1.05 pcf (17 kg/m<sup>3</sup>) to greater than 2.5 pcf (40 kg/m<sup>3</sup>) have been produced using Geolite modifier 210.

Formulation examples of several representative formulations using this Geolite Modifier 210 technology are shown in the following table.

Table 1: Performance in Slabstock Foams

Density, pcf	1	1	1.25	1.25	1.25	1.25	1.5	1.5	1.5	1.5	1.8	1.8	1.8	1.8
IFD, 25%	15	20	15	20	25	30	15	20	25	30	15	20	25	30
GM-210, pphp	3.5	3.6	2.4	2.5	2.6	2.7	1.7	1.9	2.0	2.1	1.1	1.3	1.5	1.6
Index 105.0	85.0	93.0	85.0	93.0	99.0	105.0	85.0	93.0	99.0	105.0	85.0	93.0	99.0	
MeCl <sub>2</sub> , pphp	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Water, total, pphp	6.65	6.30	5.12	4.92	4.76	4.63	4.17	4.03	3.92	3.83	3.41	3.31	3.24	3.18
% ABA Reduction	100	100	100	100	100	100	100	100	100	100	100	100	100	100

The base case is a MeCl<sub>2</sub>-blown foam (Momentive Performance Materials formulas).

All formulations calculated on same basis: do not include effect of amine, tin, surfactant and other additives.

## Geolite\* Modifier 210

### Processing Considerations

The formulated grades of foam using Geolite technology will exhibit higher reaction exotherms than conventional formulations since higher water concentrations are required. This concern must be addressed prior to the adoption of this technology. Lower index formulations serve to reduce this high exotherm, but higher than normal exotherms should be expected.

Geolite modifier 210 utilizes an environmentally friendly technology. The additive eliminates the emission of ABAs, and, when used with low-index formulations, TDI emissions into the plant environment may be greatly reduced.

Geolite modifier 210 contains 22.4 percent water. This must be taken into account when calculating a foam formulation. It is recommended that Geolite modifier 210 be kept in polyethylene or stainless steel tanks, kept above 50°F and pumped through heat-traced lines when possible.

### Formulations

The following are some typical formulations utilizing Geolite modifier 210:

Foam Grade (pcf/25% IFD, lb)	1.0/15	1.2/20	1.6/22
European Grade (kg/m <sup>3</sup> /25% IFD, N/323 cm <sup>2</sup> )	16.0/67	19.2/89	25.6/98
Polyol, 3000 Molecular Weight	100	100	100
Water, total	6.6	5.14	3.7
Stannous Octoate, T-9	0.24	0.23	0.26
Niax Catalyst A-133	0.06	0.1	0.17
Niax Silicone L-620	1.2	1.2	1.2
Geolite Modifier 210	3.5	2.7	1.7
Index	85	93	95

## Geolite\* Modifier 210

### 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.

### Product Safety, Handling and Storage

Customers considering the use of this product should review the latest Material Safety Data Sheet and label for product safety information, handling instructions, personal protective equipment if necessary, and any special storage conditions required. Material Safety Data Sheets are available at [www.momentive.com](http://www.momentive.com) or, upon request, from any Momentive Performance Materials representative. Use of other materials in conjunction with Momentive Performance Materials products (for example, primers) may require additional precautions. Please review and follow the safety information provided by the manufacturer of such other materials.

### Limitations

Customers must evaluate Momentive Performance Materials products and make their own determination as to fitness of use in their particular applications.

## Emergency Service

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Momentive Performance Materials maintains an around-the-clock emergency service for its products. The American Chemistry Council (CHEMTREC), Transport Canada (CANUTEC), and the Chemical Emergency Agency Service also maintain an around-the-clock emergency service for all chemical products:

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At sea	Radio U.S. Coast Guard, which can directly contact Momentive Performance Materials at 518.233.2500 or CHEMTREC at 800.424.9300.	

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