

## Geolite\* Modifier 210

### Description

Geolite Modifier 210 is a stabilizing additive whose technology can offer ways 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 can facilitate 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 airflow. 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.

### Key Features and Benefits

- 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**

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

**Processing Recommendations**

**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. More over, 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.

**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:

<b>Foam Grade (pcf/25% IFD, lb)</b>	<b>1.0/15</b>	<b>1.2/20</b>	<b>1.6/22</b>
<b>European Grade (kg/m<sup>3</sup>/25% IFD, N/323 cm<sup>2</sup>)</b>	<b>16.0/67</b>	<b>19.2/89</b>	<b>25.6/98</b>
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
Niix Catalyst A-133	0.06	0.1	0.17
Niix Silicone L-620	1.2	1.2	1.2
Geolite Modifier 210	3.5	2.7	1.7
Index	85	93	95

**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 should review the latest Safety Data Sheet (SDS) and label for product safety information, safe handling instructions, personal protective equipment if necessary, emergency service contact information, and any special storage conditions required for safety. Momentive Performance Materials (MPM) maintains an around-the-clock emergency service for its products. SDS are available at [www.momentive.com](http://www.momentive.com) or, upon request, from any MPM representative. For product storage and handling procedures to maintain the product quality within our stated specifications, please review Certificates of Analysis, which are available in the Order Center. Use of other materials in conjunction with MPM 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.

**Contact Information**

For product prices, availability, or order placement, contact our customer service at [Momentive.com/Customerservice/](https://www.momentive.com/Customerservice/)

For literature and technical assistance, visit our website at: [www.momentive.com](http://www.momentive.com)

**DISCLAIMER:**

**THE MATERIALS, PRODUCTS AND SERVICES OF MOMENTIVE PERFORMANCE MATERIALS INC. AND ITS SUBSIDIARIES AND AFFILIATES (COLLECTIVELY “SUPPLIER”), ARE SOLD SUBJECT TO SUPPLIER’S STANDARD CONDITIONS OF SALE, WHICH ARE INCLUDED IN THE APPLICABLE DISTRIBUTOR OR OTHER SALES AGREEMENT, PRINTED ON THE BACK OF ORDER ACKNOWLEDGMENTS AND INVOICES, AND AVAILABLE UPON REQUEST. ALTHOUGH ANY INFORMATION, RECOMMENDATIONS, OR ADVICE CONTAINED HEREIN IS GIVEN IN GOOD FAITH, SUPPLIER MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, (i) THAT THE RESULTS DESCRIBED HEREIN WILL BE OBTAINED UNDER END-USE CONDITIONS, OR (ii) AS TO THE EFFECTIVENESS OR SAFETY OF ANY DESIGN INCORPORATING ITS PRODUCTS, MATERIALS, SERVICES, RECOMMENDATIONS OR ADVICE. EXCEPT AS PROVIDED IN SUPPLIER’S STANDARD CONDITIONS OF SALE, SUPPLIER AND ITS REPRESENTATIVES SHALL IN NO EVENT BE RESPONSIBLE FOR ANY LOSS RESULTING FROM ANY USE OF ITS MATERIALS, PRODUCTS OR SERVICES DESCRIBED HEREIN.**

Each user bears full responsibility for making its own determination as to the suitability of Supplier’s materials, services, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating Supplier’s products, materials, or services will be safe and suitable for use under end-use conditions. Nothing in this or any other document, nor any oral recommendation or advice, shall be deemed to alter, vary, supersede, or waive any provision of Supplier’s standard Conditions of Sale or this Disclaimer, unless any such modification is specifically agreed to in a writing signed by Supplier. No statement contained herein concerning a possible or suggested use of any material, product, service or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Supplier covering such use or design, or as a recommendation for the use of such material, product, service or design in the infringement of any patent or other intellectual property right.

\*Geolite is a trademark of Momentive Performance Materials Inc.1033

**Momentive and the Momentive logo are trademarks of Momentive Performance Materials Inc.**