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Niax* Catalyst A-1

Product Description

Niax catalyst A-1 contains 70 percent bis(2-dimethylaminoethyl) ether, one of the most active urethane foam amine catalysts known. As a matter of convenience, the pure amine ether has been diluted with 30 weight percent dipropylene glycol to facilitate metering and to permit the use of conventional quantities in foam formulations.

Typical Physical Properties

Specific Gravity at 20/20°C (68/68°F)	0.9022
Viscosity at 20°C (68°F), cP	4.1
Freezing Point	Sets to glass below -80°C (-112°F)
Vapor Pressure, mm Hg	0.01
Solubility in Water at 20°C (68°F)	Complete
Solubility in Benzene at 20° (68°F)	Complete
Refractive Index, n_D 25°C	1.4346
Flash Point, °C (°F)	
Pensky-Martens Closed Cup(1)	74 (165)

(1) ASTM Method D 93

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.

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Catalytic Activity

The basic chemical reactions important in the polyether foaming process are the polyol/isocyanate reaction and the water/isocyanate reaction. Table 1 shows how Niax catalyst A-1 compares to various amine catalysts in promoting these two basic reactions. In the polyol/isocyanate (alcohol/isocyanate) reaction, Niax catalyst A-1 gives a specific rate constant that is about 10 percent higher than a similar blend of triethylenediamine, the next most active amine. In the water/isocyanate reaction, however, Niax catalyst A-1 has a specific rate constant that is 50 percent greater than triethylenediamine, the next most active amine.

The strong catalytic effect of Niax catalyst A-1 toward the water/isocyanate reaction facilitates the balancing of the catalysis of the polyol/isocyanate reaction by small variations in the stannous octoate level. This control is important in the production of commercial open-celled, split-free, flexible urethane foam. The level of Niax catalyst A-1 can be adjusted over a wide range to permit control of foam rise time without a sacrifice in tin operating range.

Table 1: Reaction Rate Constants of Niax Catalyst A-1 Compared to Conventional Amine Catalysts

Alcohol/Isocyanate Reactions[1]	Specific Rate Constant[2], K_a/C_a (min^{-1})
Niax Catalyst A-1	56
Triethylenediamine	49
N,N-Dimethylethanolamine	10
N-Methyl Morpholine	7.5
N-Ethyl Morpholine	5.0
Water/Isocyanate Reactions[3]	
Niax Catalyst A-1	158
Triethylenediamine	98
N,N-Dimethylethanolamine	68
N-Methyl Morpholine	14
N-Ethyl Morpholine	10

(1) Equal parts stannous octoate used with each amine
(2) Kinetic data obtained with a model reaction system consisting of butanol and phenyl isocyanate at 25°C in a solvent blend of 90 percent toluene and 10 percent dimethylformamide
(3) Kinetic data obtained with a model reaction system consisting of water and phenyl isocyanate at 25°C in a solvent blend of 90 percent toluene and 10 percent dimethylformamide

Performance in Urethane Foam

Niax catalyst A-1, when used alone or as part of the amine catalyst system, helps improve the processing characteristics and physical properties of the following types of flexible foams:

- High-density unfilled foam
- Filled foam
- High-load-bearing flexible foam
- Low-density foam
- High Resilience molded foam

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 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

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:

Location	Momentive Performance Materials Products	All Chemical Products
Mainland U.S., Puerto Rico	518.233.2500	CHEMTREC: 800.424.9300
Alaska, Hawaii	518.233.2500	CHEMTREC: 800.424.9300
Canada	518.233.2500	CANUTEC: 613.996.6666 (collect) or CHEMTREC: 800.424.9300
Europe, Middle East, Africa	+32.(0)14.58.45.45 (Belgium)	CHEMTREC: +1-703.527.3887 (collect)
Latin America, Asia/Pacific, all other locations worldwide	+518.233.2500	CHEMTREC: +1-703.527.3887 (collect)
At sea	Radio U.S. Coast Guard, which can directly contact Momentive Performance Materials at 518.233.2500 or CHEMTREC at 800.424.9300.	

DO NOT WAIT. Phone if in doubt. You will be referred to a specialist for advice.

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