



ALWAYS ONE
STEP AHEAD

AMERICAS

POLYURETHANE ADDITIVES FOR
SPRAY FOAM





SILICONE SURFACTANTS

MAIN ROLE & TYPICAL BENEFITS

Reduced surface tension of reactants:

- Easy mixing and emulsification
- Avoidance of phase separation after mixing
- Use of different base polyols and fillers/extenders
- Support for emulsification of insoluble blowing agents
- Support of reaction efficiency and uniform foam formation

Bubble formation:

- Increased nucleation of air and blowing gas
- Regular and uniform cell formation
- Enhanced blowing efficiency and reduced loss of blowing agent

Bubble stabilization:

- Maximized closed cell content when desired
- Stabilization of cells during foam expansion
- Reduced voids and defects
- Generate open cells when desired

Bubble growth/coalescence:

- Control of average cell size
- Isotropy
- Improved key foam properties such as thermal conductivity and compression strength

A LEADER IN POLYURETHANE ADDITIVES

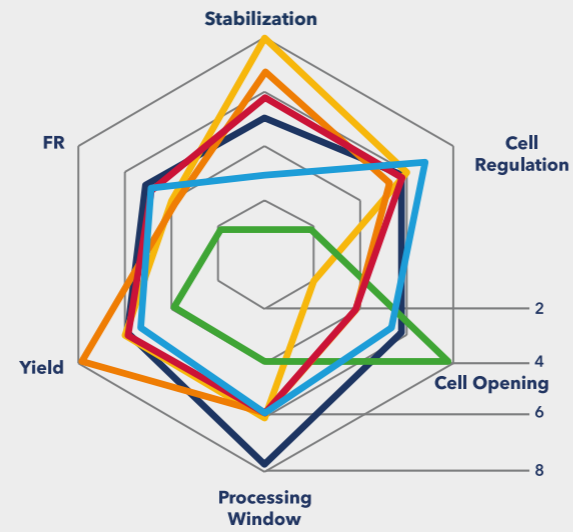
Niax™ polyurethane additives offer a broad range of products able to satisfy the latest requirements of spray foam systems for the production of high-performance insulation foam.

The success of innovative and cost effective foam production depends largely upon selecting the right surfactants, catalysts, and other additives. In support of your success, Momentive Performance Materials, Inc. has a team of experts available with the technical know-how to help solve your production challenges, or to craft Niax Additives solutions tailored to your development needs.

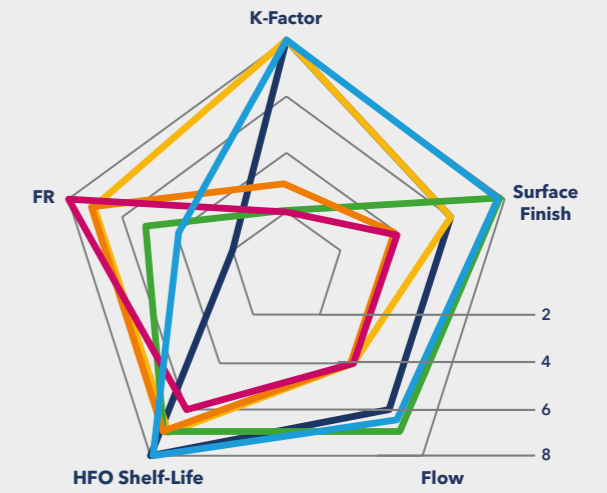


Example of the effect that the surfactant choice can have on final foam characteristics

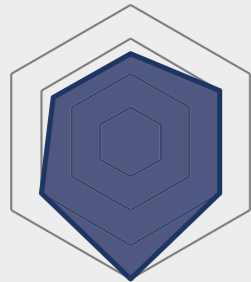
SILICONES FOR OPEN-CELL SPRAY FOAM



SILICONES FOR CLOSED-CELL SPRAY FOAM

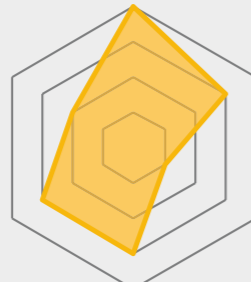


L-6189



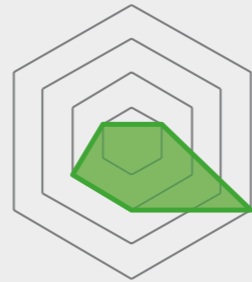
First choice for OCX formulations, can improve formulation compatibility and shelf-life.

L-5388



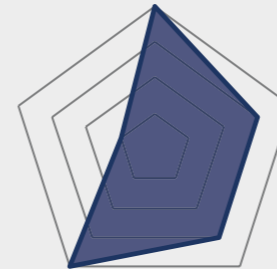
Excellent foam cell structure and foam stability. May need a cell-opening additive. May be used at lower use levels.

L-6186



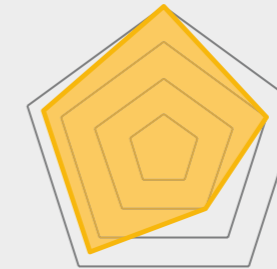
Excellent cell opening at medium-low density and good polyol compatibility. May require a co-surfactant.

L-6972



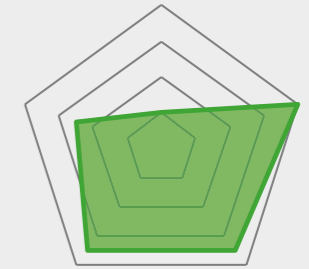
Excellent thermal insulation properties via good flow and fine cells. Excellent chemical stability to support shelf-life.

L-6888



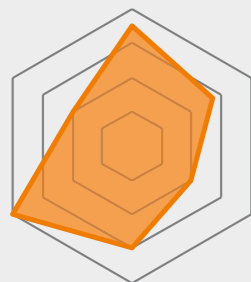
Good thermal conductivity and surface quality. Improved performance in small-scale fire test.

L-5107LF



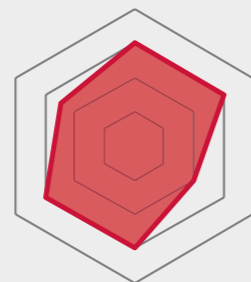
Excellent cell stabilization for improved mechanical properties and compressive strength. Excellent cell isotropy and good flow.

Y-16312



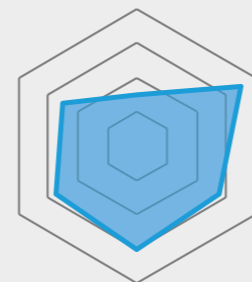
Surfactant for improved yield and processing.

L-6630



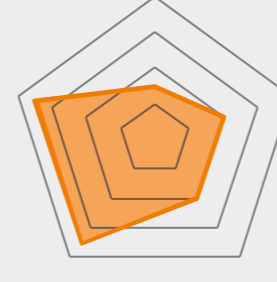
Balanced foam stabilizer for open-cell foam with fine cell structure.

L-6165



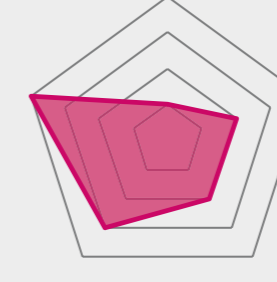
Balanced surfactant that provides good dimensional stability, yield, processing window, and cell opening.

L-5420



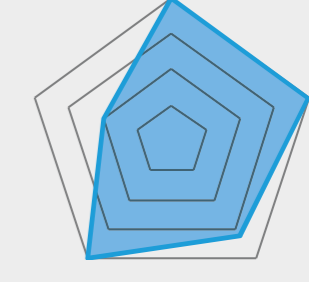
Medium high-efficient silicone, wide processing latitude. Excellent cell stabilization and control. Maximized blowing agent retention via avoidance of cell coalescence.

L-6110



Good dimensional stability and improved fire properties.

L-6642



Good flow, surface voids reduction and storage stability in fully formulated systems. Compatibility with a large variety of blowing agents, including pentane isomers and HFOs.

FR = Fire Rating Contribution
HFO = Hydrofluoro Olefin

NIAX CATALYSTS

MAIN ROLE & TYPICAL BENEFITS

In spray foams, catalysts are responsible for activation of crosslinking reactions, as well as water reaction with development of CO² blowing gas. Exothermic reaction causes physical blowing agent evaporation and further foam blowing.

Catalyst balance between blow and gel determines the viscosity build-up and the overall catalyst level defines the rise and curing times.

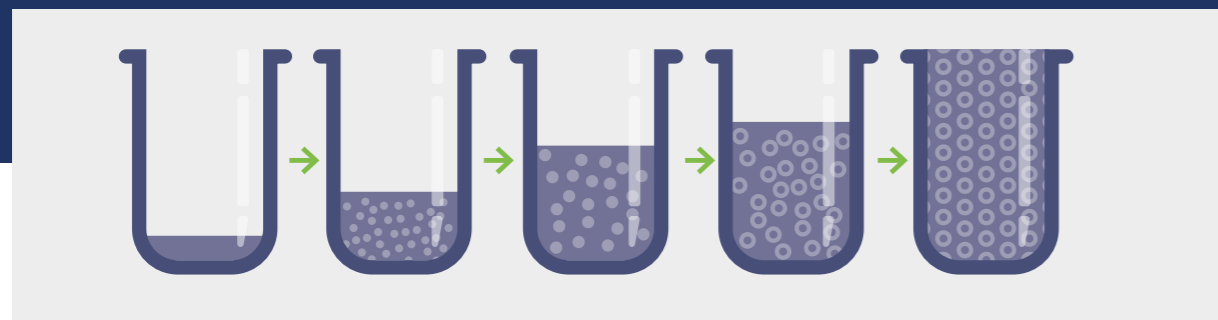
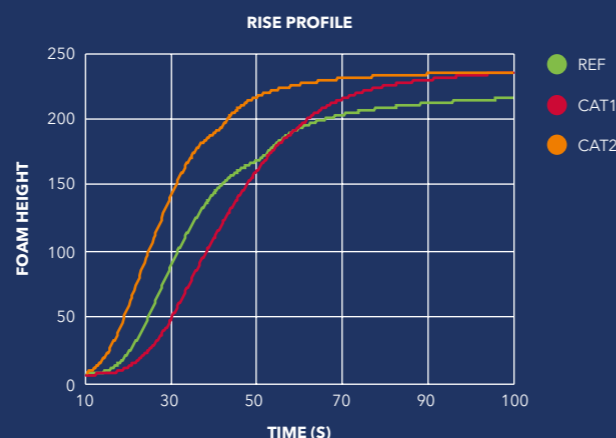
Catalyst level and balance are important for maximizing productivity and achieving a sufficient degree of polymerization. The Niox portfolio includes a range of standard grades, as well as catalysts able to meet specific requirements of PIR boardstock production.

A TYPICAL ROLE SPLIT OF CATALYSTS IS:

Blowing catalysts: promoting MDI-water reaction, thus increasing expansion rate.

Gelling catalysts: promoting the crosslinking reaction, mainly with -OH groups.

Trimerization catalysts: promoting the isocyanurate formation (PIR foams).



Test data. Actual results may vary.

Efficiency ↑	AMINE CATALYSTS					POTASSIUM CATALYSTS	METAL CATALYSTS		
	Niox A-1/A-99	Niox C-5	Niox DMEE	Niox C-28	Niox C-8	Niox C-41	Niox C-27	Niox K Acetate	Niox LC-5604 LC-5622
	Niox EF-100	Niox C-10LV	Niox DMEA	Niox BDMA	Niox C-31	Niox K-Zero G	Niox MC-710		
	Niox DMDEE								
	Niox A-107								

Reactive amines Improved shelf-life with HFO-1233zd Trimerization activity

NIAX PRODUCT RANGE

Product	Viscosity @25 °C cps	Specific Gravity @25 °C
Niox catalyst A-1	4.1	0.90
Niox catalyst A-99	1.4	0.85
Niox catalyst BDMA	26	0.9
Niox catalyst C-5	1.6	0.83
Niox catalyst C-8	3.0	0.85
Niox catalyst C-10LV	10	0.91
Niox catalyst C-27	10	1.04
Niox catalyst C-28	14	1.08
Niox catalyst C-31	100	1.18
Niox catalyst C-41	32	0.92
Niox catalyst DMDEE	29	0.96
Niox catalyst DMEA	3.8	0.89
Niox catalyst DMEE	10	0.96
Niox catalyst EF-100	12	0.95
Niox catalyst K-ZERO G	3000	1.07
Niox catalyst K-ZERO LV	600	1.07
Niox catalyst Potassium Octoate LV	2500	1.11
Niox Potassium Octoate	6000	1.12
Niox catalyst Potassium Acetate	120	1.27
Niox catalyst MC-710	4500	1.16
Niox silicone L-5107 LF	400	1.06
Niox silicone L-5420	350	1.06
Niox silicone L-5388	2500	1.02
Niox silicone L-6110	400	1.08
Niox silicone L-6165	300	1.02
Niox silicone L-6186	320	1.05
Niox silicone L-6189	400	1.02
Niox silicone L-6630	500	1.05
Niox silicone L-6888	1018	1.03
Niox silicone L-6972	2200	1.03
Niox silicone Y-16312	2000	1.03
Niox additive AP-01	6	1.08



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