

AMERICAS

POLYURETHANE ADDITIVES GUIDE

RIGID, MOLDED, AND
SPECIALTY APPLICATIONS



ALWAYS ONE
STEP AHEAD



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A LEADER IN POLYURETHANE ADDITIVES

Momentive Performance Materials, Inc. offers one of the most trusted and diverse polyurethane additive product lines in the industry, ranging from a broad array of silicone stabilizers and a full portfolio of amine and metal-based catalysts to a selection of organic-based property modifiers.

Developed in 1962, Niax brand additives have long been essential ingredients in polyurethane formulations used to meet the specialized processing and performance needs of customers across the globe. Niax grades include a comprehensive line of silicones, catalysts, and process modifiers for polyurethane foam production.

Momentive is a pioneer in the polyurethanes additives industry and continues to serve customers with leading innovations, creative solutions, and excellent application expertise.

MOMENTIVE POLYURETHANE
ADDITIVES GLOBAL SITES



POLYURETHANE ADDITIVES FOR
RIGID, MOLDED, AND SPECIALTY
APPLICATIONS



SILICONES FOR RIGID FOAMS

Appliances
Panels
Discontinuous applications
Spray
One Component Foam



SILICONES FOR MOLDED FOAMS

Automotive seating
Head rest
NVH applications



SILICONES FOR SPECIALTY
APPLICATIONS

Shoe soling
Automotive parts
Cushioning
Mechanical froth
CASE

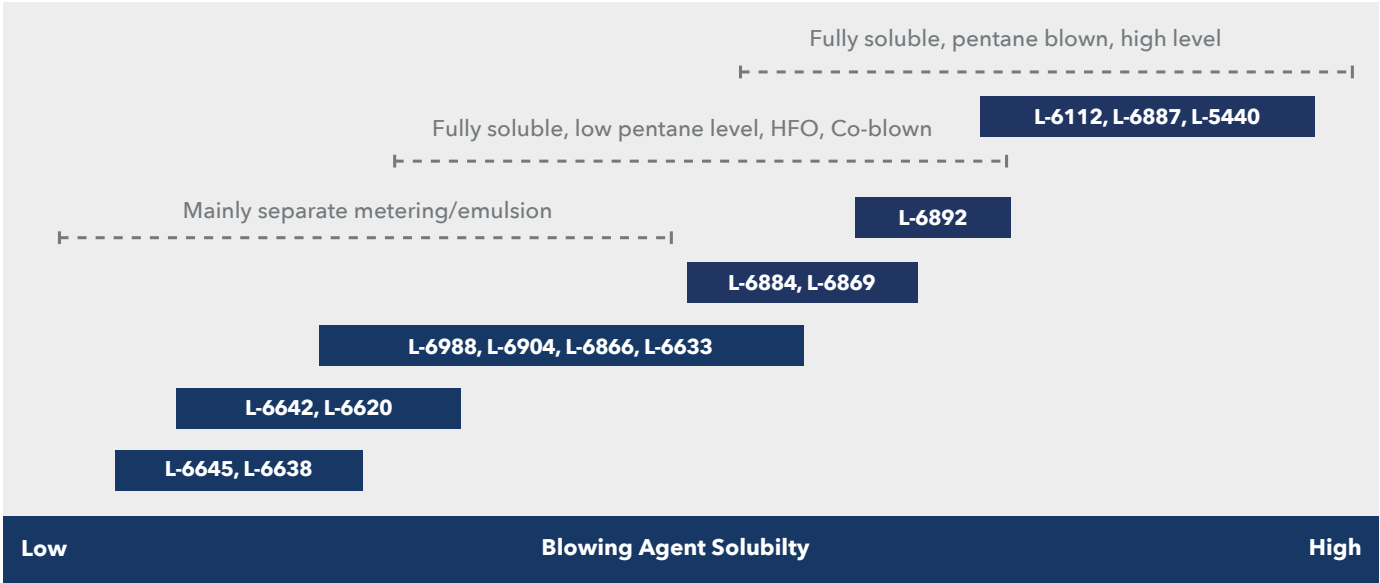


CATALYSTS

Amine catalysts
Trimerisation catalysts and additives
Metal catalysts
Reduced-emission catalysts



Relative Scale of Niaux Silicone Contribution to Blowing Agent Solubility in Rigid Foam System Applications



SILICONES FOR DISCONTINUOUS APPLICATIONS

Silicones	Fine Cells	Pentane Solubility In Polyols	Blowing Agents Emulsification	Cell Stabilization	Foam Flow	Void Reduction	Product Description
Appliance							
L-6869	●●●●	●●●	●●●	●●●	●●●●	●●●	Can be used with hydrocarbons or HFO to improve foam flowability and provide low thermal conductivity
L-6866	●●●●	●●	●●	●●●●	●●●	●●●●	For pentane-blown refrigerators and discontinuous panels to reduce surface voids formation, while still delivering excellent lambda value
L-6892	●●●●	●●●●	●●●	●●●	●●●	●●●●	High-purity silicone, can be used with hydrocarbons or HFO to improve foam voids and provide low thermal conductivity and excellent solubility
L-6981	●●●●	●●	●●	●●●●	●●●●	●●●●	Best for flow and void reduction
L-6988	●●●●	●●	●●●	●●●	●●●	●●●	Very fine cells with pentane and HFO/HC, increase froth shear stability thus reducing voids formation, good storage stability in acidic condition
Pour in Place							
L-6110	●●	●●●	●●	●●●	●●●	●●●	High-purity silicone that can be used in a range of rigid applications with good fire properties
L-6112	●●	●●●●	●●	●●●	●●●	●●●●	High-purity silicone, can be used with hydrocarbons or HFO, produce foams with good dimensional stability, low voids, and good fire properties
L-6904	●●●●	●●	●●●●	●●●●	●●●●	●●●	Strong emulsifier, fine cells with all blowing agents - continuous and discontinuous applications
General Purpose							
L-6887	●●●●	●●●●	●●●●	●●●●	●●●	●●●	Excellent polyol/pentane solubility - can provide very fine cells for discontinuous applications especially refrigerators
L-6894	●●●●	●●●●	●●	●●●●	●●●●	●●●	High-purity silicone that can be used with hydrocarbons or HFO, improved flow, and improved thermal conductivity

HFO = Hydrofluoro Olefin, PIR = Polyisocyanurate, PUR = Polyurethane, HC = Hydrocarbons
Features: Strong = ●●●●, Moderate = ●●



SILICONES FOR CONTINUOUS APPLICATIONS

Silicones	Fine Cells	Pentane Solubility In Polyols	Blowing Agents Emulsification	Cell Stabilization	Foam Flow	Void Reduction	Product Description
Metal Panel							
L-5440	●●	●●●●	●●	●●●●	●●●	●	For HFO and pentane co-blown with water, good flow and dimensional stability
L-6620	●●●●	●●	●●●	●●	●●●	●●●	For HFO and pentane, good flow and dimensional stability
L-6634	●●●	●●●	●●●	●●●	●●●	●●●	Reduced foam voids formation in continuous and discontinuous applications
L-6638	●●	●●	●●	●●	●●●●	●●●●	Versatile surfactant broadly compatible with typical rigid polyol blends
L-6642	●●●	●●	●●	●●	●●●●	●●●	Balanced stabilizer with good voids control and flow for both continuous and discontinuous processes, suitable for all blowing agents included formic acid and HFOs

Silicones	R Value	Pentane Emulsification	Flow/Flatness	Compressive Strength	Surface Quality	Pentane Isomer	Key Performance Benefit
PIR Flex Face							
L-5111	●●●●	●●●	●●	●	●●	c	Fine cells with mainly cyclo-pentane blowing agents - for PIR/PUR boardstock
L-5151	●●●	●●●	●●●	●●●	●●●	n/i	Broad processing window silicone with good compatibility and flow in PIR formulations
L-5141	●●●	●●●	●●●●	●●●●	●●●●	n/i	Good flow, good compressive, good surface finish
Y-16548	●●●●	●●●	●●●	●●●	●●●	n/i/c	Highest aged R-Value and TDRV
Y-16561	●●●●	●●●	●●●●	●●●●	●●●●	n/i	High aged R-Value and TDRV good compressive strength, and good surface finish

HFO = Hydrofluoro Olefin, PIR = Polyisocyanurate, PUR = Polyurethane, TDRV=Temperature Dependent R-Value
Features: Strong = ●●●●, Moderate = ●



SILICONES FOR ONE COMPONENT FOAMS

Silicones	Yield	Dimensional Stability	Structure	Flow	Solubility	Product Description
L-5345	●●●●	●●●	●●●	●●●	●●●	Excellent candidate for fine cells and good dimensional stability performance. Can provide excellent performance in summer/winter formulations with high levels of fillers
L-5348	●●●●	●●●	●●●	●●●	●●●	High froth volume, good compatibilization, and excellent storage stability
L-5350	●●	●●	●●●	●●	●●	Multipurpose stabilizer mainly for straw foam applications
L-5351	●●●●	●●●	●●●	●●●	●●●	Improved miscibility of components, smooth flow, fine cells, and good dimensional stability. Recommended for high-yield foams, winter grades and formulations, including chloroparaffin
L-5360	●●	●●	●●●	●●	●●	Balanced properties in a variety of formulation types also when high levels of fillers are used
L-5388	●●●●	●●	●●●	●●●●	●●	Excellent for low-density foams, also open cells spray and packaging. Wide compatibility with polyethers and polyesters, strong foam stabilization
L-6164					●●●●	Very efficient cell-opener and cell regulator, use level 0.1 - 0.7 % on prepolymer composition
Y-16371	●●●●	●●	●●●●	●●●●	●●●	Excellent performances in winter conditions and premium foams. Easy flow and low expansion rate
Y-16450	●●●●	●●●●	●●●	●●●●	●●●	Improved dimensional stability at low density, well balanced, easy flow and pop-corn like froth



SILICONES FOR SPRAY FOAM SYSTEMS

Closed Cells Spray Foam Systems

Silicones	K-Factor	Surface Finish	Flow	HFO Shelf-Life	Fire Resistance	Product Description
L-6265	●●●	●●●●	●●●●	●●●●	●●●	Ideal for roof and flat surface applications. Excellent surface finish, cell stabilization, and compressive strength
L-6642	●●●●	●●●●	●●●	●●●●	●●	Balanced stabilizer giving excellent nucleation, fast foam thickening with good voids control and flow, also used in continuous and discontinuous panels production, can be used for all blowing agents
L-6888	●●●●	●●●	●●	●●●●	●●●●	Good thermal conductivity and surface quality. Improved fire performance
L-6972	●●●●	●●●	●●●	●●●●	●	Excellent thermal insulation properties, good flow and fine cells
Y-16659	●●	●●●	●●●	●●●●	●●●●	General surfactant, good dimensional stability, good fire properties, and reduced freeze point

HFO = Hydrofluoro Olefin
Features: Strong = ●●●●, Moderate = ●

Open Cells Spray Foam Systems

Silicones	Fine Cells	Cell-opening	Cell Stabilisation	Product Description
L-5388	●●●	●	●●●●	Excellent for low-density foams such as packaging and OCF. Wide compatibility with polyethers and polyesters, strong foam stabilization
L-6186	●●	●●●●	●●	Open-cells systems, polyester or polyether-based, for densities up to 30 kg/m³
L-6189	●●●●	●●●	●●●	Excellent for low-density foams, 10-15 kg/m³, water-blown, polyethers or polyesters-based, fine and homogeneous cell structure, good polyol solubility
Y-16312	●●●	●●	●●●●	Surfactant for improved yield and processing



Additives	PUR Discontinuous	PIR Discontinuous Panels	PIR Continuous Lamination & Block	Spray	Water Blown PUR	Packaging, Open Cells Foam	Product Description
Niax Special Additives							
RA-1		●	●		●		Can speed up foam hardening and adhesion without influencing gel time, in particular for PIR foam made with aromatic polyester polyols
AP-01	●	●	●		●		Adhesion promoter additive, can reduce surface friability in high water and/or high index formulations
FRP 240/40	●	●	●	●	●	●	Halogen free additives to help improve fire properties in both PUR or PIR foams
NA-01			●				Silicone-based composition enhancing the nucleation of gas. In combination with a conventional silicone, it reduces the cell size, potentially leading to lower foam thermal conductivity

PIR = Polyisocyanurate, PUR = Polyurethane

CATALYSTS FOR RIGID FOAMS

Catalysts	PUR Discontinuous	PUR Continuous Lamination & Block	PIR Continuous Lamination & Block	Water Blown PUR	Packaging, Open Cells Foam	Product Description
Blow Catalyst						
A-1/A-99	●	●	●	●	●	Very effective blowing catalyst, promote selectively water-NCO reactions, can improve foam flow and rate of expansion
C-5	●	●	●			General-purpose blowing catalyst
A-107	●			●		Acid-blocked delayed-action blow catalyst
EF-100S	●	●	●	●	●	Reactive blow catalyst, excellent candidate for applications where low odor is a relevant feature
C-10LV		●	●	●	●	Reactive amine catalyst, ideal for spray and open-cell applications. Blowing catalyst giving a smooth reaction profile, good candidate also in flexible molded foams
DMDEE	●				●	Moderate-activity blow catalyst, excellent storage stability also in isocyanate and prepolymers, 1K/OCF foams
Balanced Catalyst						
DMEA	●	●				Moderate odour, typically cost-effective, reactive catalyst
DMEE	●			●	●	Moderate odour, typically cost-effective, reactive catalyst, more blowing efficiency compared to DMEA
C-28	●	●	●	●	●	Balanced blow-gel catalyst, good shelf life with HFO-1233zd
C-15	●			●	●	Reactive amine catalyst ideal for spray and open cell applications. Balanced catalyst, predominantly gel
C-27	●	●	●	●	●	Low odor catalyst offering improved shelf life for water co-blown systems
Gel Catalyst						
C-8	●	●		●	●	General-purpose PUR catalyst
BDMA	●	●		●	●	Dimethylbenzylamine, weak gel catalyst, can reduce surface friability and can improve foam adhesion in particular with mainly water-blown foams
MC-710					●	Bismuth-based catalyst, exhibiting strong gel catalytic activity
Trimerization/Post Cure						
C-41	●	●	●			Strong gel catalyst promoting both PUR and PIR reaction, promote fast crosslinking, can reduce demold time and improve foam adhesion
C-31	●	●	●	●		Delayed-action catalyst for PIR and PUR, improve green strength and surface curing, reduce post expansion in thick panels

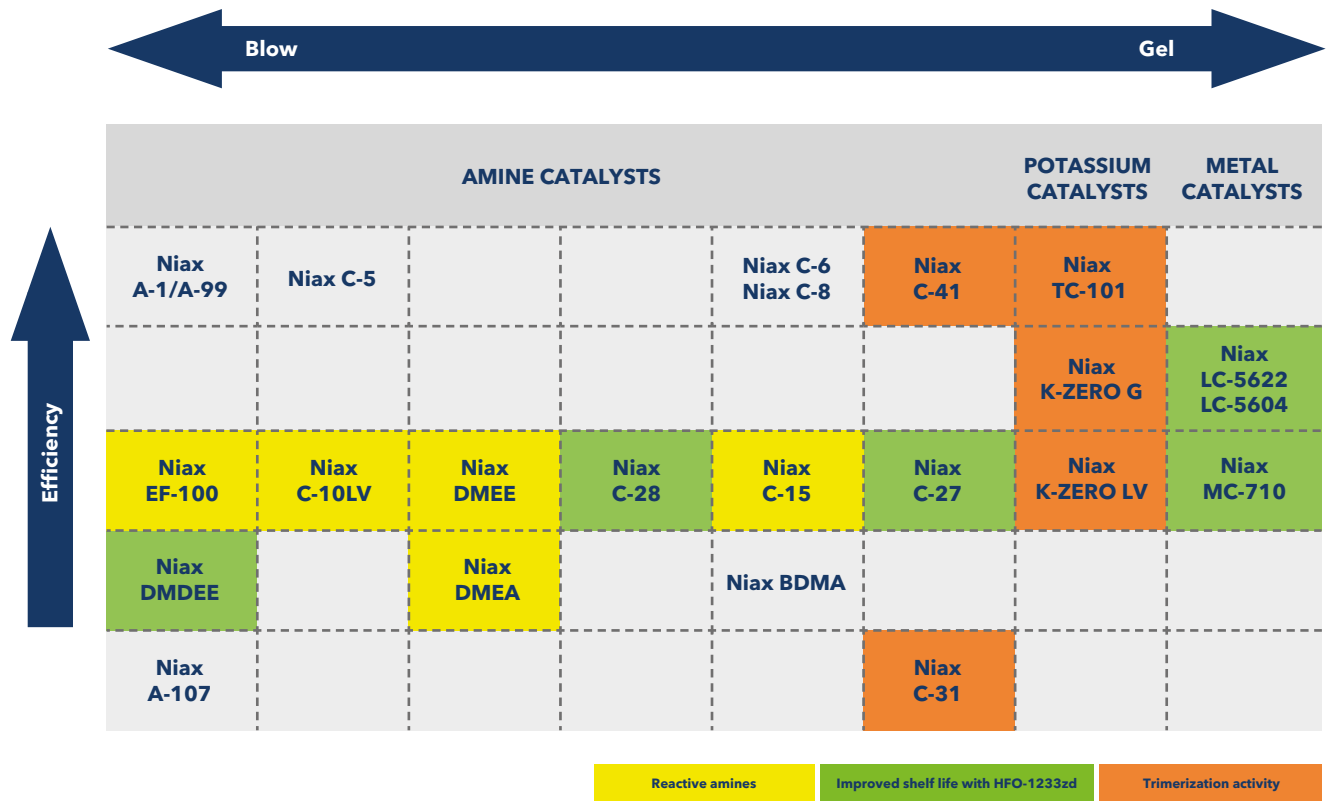
HFO = Hydrofluoro Olefin, PIR = Polyisocyanurate, PUR = Polyurethane

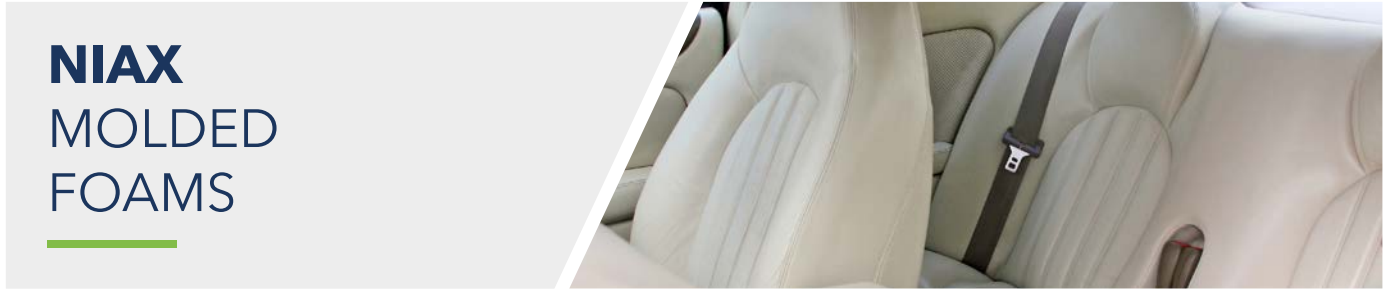
NIAX TRIMERISATION CATALYSTS

Catalyst	Viscosity (typical value @ 25 °C)	Product Description
Potassium Octoate LV	2200-2800	Potassium-based trimerisation catalyst, 15% K, ideal candidate for direct metering in continuous production of PIR panels, also used as curing additive in PUR formulations for lamination
Potassium Octoate	5000-7000	Potassium-based trimerisation catalyst, 15% K, also used as curing additive in PUR formulations for lamination
K-ZERO G	3000	Glycol-free potassium octoate, reduced MDI use and improved cell isotropy in the production of PIR panels
K-ZERO LV	600	Glycol-free potassium octoate, reduced MDI use, low viscosity to facilitate in-line metering
Potassium Acetate	120	15% K containing PIR catalyst
TC-101	180	Trimerisation catalyst based on a non-reprotoxic salt, increased efficiency and enhanced trimer conversion versus standard octoates. Low viscosity to facilitate on-line metering

MDI = Methylene Diphenyl Diisocyanate, PIR = Polyisocyanurate, PUR = Polyurethane

Niax Catalysts for Rigid Foams Applications





Silicones	HR TDI	TDI/MDI	HR MDI	VE MDI	Low Odor	Product Description
Viscoelastic MDI						
L-3881				○		Stabilizing reduced-emission silicone for viscoelastic foams, co-silicone together with L-3639
L-3884				○		Strong stabilizing and cell regulation for MDI viscoelastic foams surfactant; reduced-emissions in accordance with VDA 278
High Resilience Foam						
L-3415			○			Reduced-emission silicone with medium cell-opening
L-3639		○	○	○		Reduced-emission, medium-potency silicone providing good stabilization along with good foam openness, co-silicone for VE
L-3639S		○	○	○		Reduced-emission, medium-potency silicone offering good stabilization along with good foam openness, co-silicone for VE, water-soluble
L-3416		○	○			Reduced-emission silicone with medium cell-opening
L-5309J	○	○	○			High efficiency, very wide process window
Y-10366J	○	○	○			Very high efficiency
L-3551	○	○				Reduced-emission, medium-potency, water-soluble silicone
L-3185	○					Reduced-emission, high-efficiency balanced silicone
Low Odor						
L-3681			○		○	Low VOC, ultra low odor surfactant for HR MDI
L-3682		○	○		○	Low VOC, ultra low odor surfactant for low density HR MDI
L-3686		○			○	Low VOC ultra low odor surfactant, medium potency for TM-20

TDI/MDI = Typically 80/20 blend, TDI = Toluene Diisocyanate, MDI = Methylene Diphenyl Diisocyanate, HR = High Resilience, VE = Viscoelastic



Catalysts	Blow Amine Catalyst	Balanced Amine Catalyst	Gel Amine Catalyst	Product Description
Reduced-emission Catalysts				
EF-100S	○			Reactive reduced-emission blow catalyst
EF-150	○			Delayed-action reactive reduced-emission blow catalyst
EF-640		○	○	High-purity, balanced reactive amine; predominantly gel
EF-600S		○	○	Balanced catalyst; predominantly gel
EF-700	○	○		Balanced catalyst; predominantly blow
Niax Catalysts				
A-1	○			Standard blow catalyst
A-107	○			Delayed-action blow catalyst
A-400	○			Delayed-action load building (TDI), cell-opening, improved flowability MDI
A-440	○			Delayed-action load building (TDI), higher cell-opening, improved flowability MDI, low water
A-4	○			Catalyst for improved surface cure
C-174	○			HR MDI blow catalyst
C-225		○		Balanced delayed-action catalyst
C-247			○	Delayed-action gel catalyst
A-33			○	Key gel catalyst



NIAX

SPECIALTY APPLICATIONS

FOOTWEAR, MECHANICAL FROTH, AND CASE

NIAX SILICONES

Silicones	Microcellular (Polyether)	Microcellular (Polyester)	SRIM/Composite	Integral Skin Foam	PU Leather/Coatings	Mechanical Froth	Product Description
L-1500	●						Standard surfactant for microcellular systems (PES)
L-1501	●	●					Wide processing latitude with excellent open cells for low-medium density systems
L-1507	●	●		●			Low-density polyester or polyether-based microcellular systems with excellent emulsification (> 0,3 g/cc)
L-1541		●	●				High-density polyester-based microcellular systems with thick skin and SRIM applications
L-1568	●	●		●			Low density (0,25-0,35 g/cc) polyester or polyether based microcellular systems, good stabilization, skin and fine cell structure
L-5302	●		●	●			Medium-stabilizing surfactant can be considered for use in integral skin and high-density polyether-based microcellular systems
L-5306	●			●			Low VOC strong stabilizing surfactant for I-skin and high-density microcellular applications
L-5309J	●		●	●			Surfactant for I-skin with HFO or CP, medium-low stabilization, good open foam content
L-1131					●		Cell stabilizer for wet process PU leather, provides good deposition, increases thickness, speeds up DMF and water exchange
L-1160					●		Linear reactive silicone, enhance anti-sticking property, good solubility in PU system. Improves leveling in coating application
L-5614					●		Industry-standard surfactant for the mechanically frothed foam process
L-5617					●		Low VOC surfactant analog of L-5614, used in the mechanically frothed foam processes
L-5639					●		A low VOC mechanical froth surfactant, non-hydrolysable, provides high closed cell content while reducing both froth density and shear induced-cell collapse
L-5641					●		Low VOC surfactant for increased closed cell content and decreased density (< 300 kg/m³)
L-5690					●		Co-surfactant that enhances froth stability and reduce foam density when used with standard mechanical froth surfactants

HFO = Hydrofluoro Olefin

NIAX AMINE & SPECIALTY CATALYSTS

Catalysts	Microcellular/Shoe Sole	SRIM/Composite	Elastomers	Spray Elastomer	Integral Skin Foam	PU Leather/Coatings	Binder	Mechanical Froth	Product Description	Pot Life	Curing Speed	Hydrolytic Stability
A-440	●	●		●					Delayed-action, blowing-selective amine catalyst developed for microcellular foams	2	2	4
A-533	●	●	●	●	●	●			Industry-standard TEDA catalyst in (mono)ethylene glycol	1	4	4
A-570	●	●	●		●				Highly delayed tertiary amine, highly gel selective	3	2	4
A-575	●	●	●		●				DBU based temperature-activated, delayed-action, powerful, gelling-selective catalyst. Low water	3	2	4
A-577		●	●		●				Delayed-action, powerful, gelling-selective catalyst	3	2	4
LC-1370			●	●				●	Delayed-action, thermally activated catalyst with an activation temperature above 70°C	4	1	4
LC-1371			●	●				●	Delayed-action, thermally activated catalyst with an activation temperature above 70°C. Higher activity compared to LC-1370	4	1	4
LC-2901		●	●				●		Heat-activated catalyst for isocyanate binder formulations (Sn-free)	3	2	4
MC-710	●	●		●	●	●			Enhanced reactivity and stability over MC-810	1	4	3
MC-810	●	●		●	●	●			Tin free metal-based catalyst, strong gelling, can replace DBTDL	1	3	2

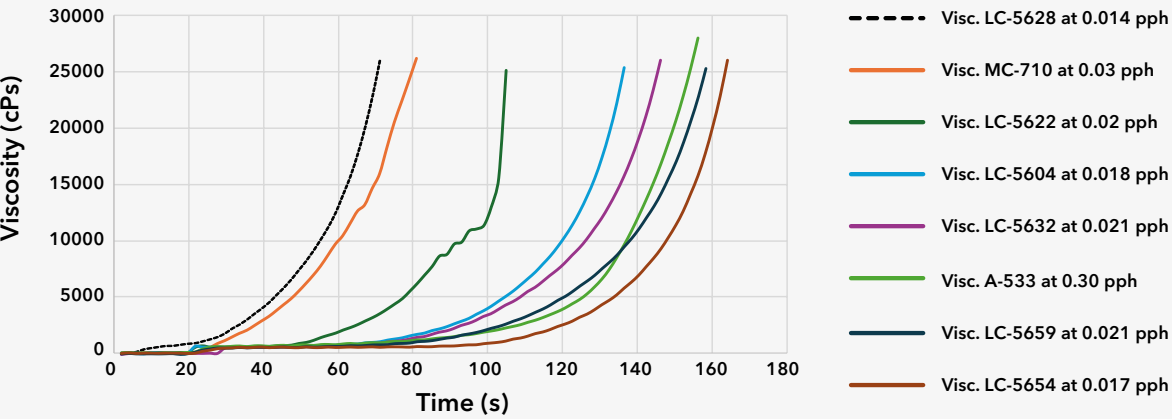
4 = more ; 1 = less

NIAX METAL CATALYSTS BASED ON ORGANOTIN

Catalysts	SRIM/Composite	Elastomers	PU Leather/Coatings	One Shot/Sprayed Elastomers	Aliphatic Reaction	Product Description	Pot Life	Curing Speed	Hydrolytic Stability
LC-5601	●	●	●	●		Good hydrolytic stability and moderate high activity. Can be used for molded foams	1	3	4
LC-5604	●	●	●	●		General-purpose organotin catalyst (DBTDL)	1	4	1
LC-5606	●	●	●	●		Moderate hydrolytic stability and delayed reactivity. Good for long flow applications	2	2	3
LC-5611	●	●	●	●		General purpose, high performance organotin widely used in polyurethane CASE applications	1	2	2
LC-5622	●	●	●			Higher active organotin analog of Niaux LC-5632, especially suitable for HFO-containing formulations	1	4	3
LC-5628	●	●	●	●	●	Highest active organotin catalyst, low freezing point	1	4	1
LC-5629	●	●	●			Most delayed organotin catalyst, improved flow, can be used in mechanical frothed foam applications	2	3	2
LC-5632	●	●	●			Organotin catalyst with very good hydrolytic stability	1	4	3
LC-5638	●	●	●	●		Organotin catalyst with moderate activity compared to Niaux LC-5604 for improved flow combined with an improved hydrolytic stability	1	4	2
LC-5650	●	●	●	●	●	Organotin catalyst analog to Niaux LC-5628 with improved hydrolytic stability	1	4	2
LC-5654	●	●	●			More active organotin catalyst analog to Niaux LC-5629 with powerful end-cure activity at elevated temperatures	2	3	2
LC-5659	●	●	●	●		General-purpose organotin catalyst (DOTDL)	1	4	2

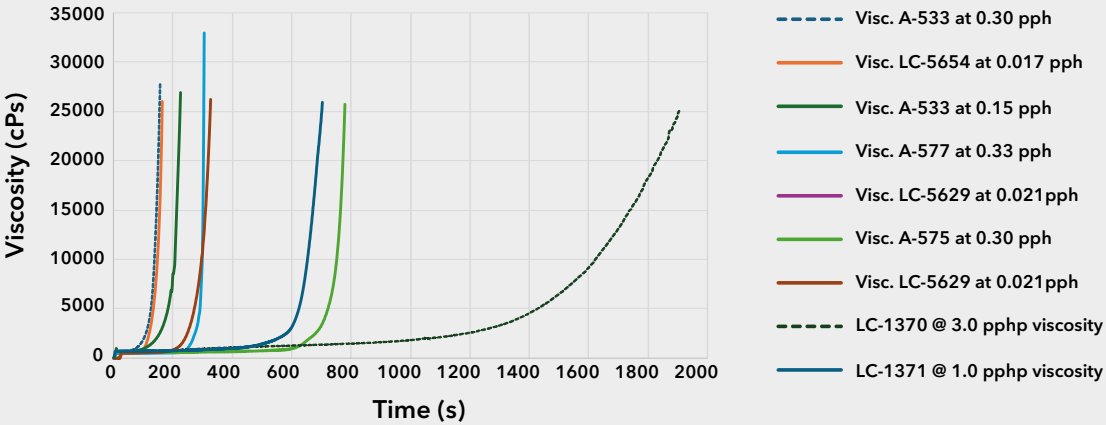
HFO = Hydrofluoro Olefin

4 = more ; 1 = less



Polyether Elastomer Formulation		
Arcol 11-34	pbw	94
Ethylene Glycol	pbw	6
Catalyst	pbw	Varied
Isonate 143L		Index 103

In order to describe the relative behavior, catalysts have been tested in the Polyether based Elastomer formulation shown on the left. Viscosities of reacting mix are determined via Brookfield viscometer (RT cure) coupled with DasyLab software. All chemicals are maintained at 20 °C prior to mixing.



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