



AMERICAS

POLYURETHANE ADDITIVES GUIDE

RIGID & MOLDED FOAMS, SPECIALTY APPLICATIONS









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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 FOAMS AND SPECIALTY APPLICATIONS



SILICONES FOR MOLDED FOAMS Automotive seating Head rest NVH applications



SILICONES FOR SPECIALTY **APPLICATIONS**

Shoe soling Automotive parts Cushioning Mechanical froth CASE





SILICONES FOR RIGID FOAMS

Appliances Panels Discontinuous applications Spray One Component Foam



CATALYSTS Amine catalysts Trimerisation catalysts and additives Metal catalysts Low-emission catalysts

NIAX MOLDED FOAMS



Silicones	HR TDI	TDI / MDI	HR MDI	VE MDI	Product Description
L-3881				0	Stabilizing low-emission silicone for viscoelastic foams, co-silicone together with L-3639
L-3882				0	Balanced low-emission silicone for viscoelastic foams, fine cell structure, stand alone
L-3639		0	0	0	Very low-emission, medium-potency silicone providing good stabilization along with good foam openness, co-silicone for VE
L-36395		0	0	0	Very low-emission, medium-potency silicone offering good stabilization along with good foam openness, co-silicone for VE, water-soluble
L-3415			0		Lower-emission silicone with high cell-opening
L-3416		0	0		Lower-emission silicone with medium cell-opening
L-3620	0	0			Low potency cell regulator, lower emissions for TDI/MDI Technology
L-3640	0	0			High-efficiency, lower-emission silicone for TDI/MDI Technology
L-3556S	0	0			Low-emission, medium-potency, water-soluble silicone
L-3185	0				Low-emission, high-efficiency balanced silicone
L-3167	0	0			Cell regulator; co-silicone surfactant for TDI
L-5309J	0	0	0		High-efficiency balanced silicone
L-3001		0	0		High cell-opening silicone
L-3002		0	0		Medium cell-opening silicone, low freezing point
L-3222		0	0		Medium-potency, high-efficient cell-opening
Y-10366J	0	0	0		High-efficiency; balanced silicone

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 D
Low-emissi	ion Catalysts			
EF-100	0			Reactive low-
EF-150	0			Delayed-actio
EF-600		0	0	Balanced cata
EF-602		0	0	Balanced dela
EF-620		0	0	Balanced cata
EF-680		0	0	Balanced dela
EF-700	0	0		Balanced cata
EF-705	0	0		Balanced cell-
Niax Cataly	/sts			
A-1	0			Standard blov
A-107	0			Delayed-actio
A-400	0			Delayed-actio
A-440	0			Delayed-actio
A-4	0			Catalyst for in
C-174	0			HR MDI blow
C-225		0		Balanced dela
C-247			0	Delayed-actio
A-300			0	Delayed-actio
A-305			0	Stronger dela
A-33R			0	Key gel cataly

Description

-emission blow catalyst

ion reactive low-emission blow catalyst

talyst; predominantly gel

elayed catalyst; predominantly gel

talyst, predominantly gel, high-efficiency, low water

elayed catalyst; predominantly gel can offer improved curing

talyst; predominantly blow

ll-opening delayed catalyst; predominantly blow

ow catalyst

ion blow catalyst

ion load building (TDI), cell-opening, improved flowability MDI

ion load building (TDI), higher cell-opening, improved flowability MDI, low water

improved surface cure

w catalyst

elayed-action catalyst

ion gel catalyst

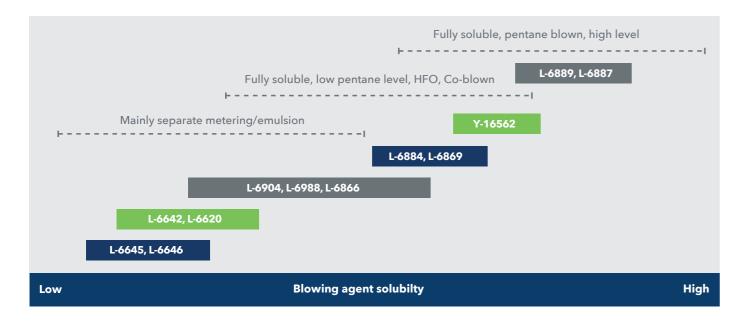
ion load-building; cell-opening gel catalyst (low corrosion)

layed action load building; cell opening gel catalyst (low corrosion)

lyst



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



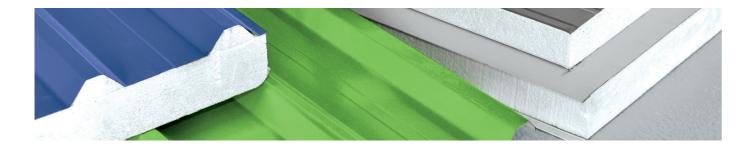
NIAX RIGID FOAMS

SILICONES FOR DISCONTINUOUS APPLICATIONS

Silicones	Fine Cour	Pentane Solubili.	Elowing Agent	Cell Stabili.	Foam Flore	Void Reduce:	Product Description
L-6869	0000	000	000	000	0000	000	Can be used with hydrocarbons or HFO to improve foam flowability and provide low thermal conductivity
Y-16562	0000	0000	000	000	000	0000	High-purity silicone, can be used with hydrocarbons or HFO to improve foam voids and provide low thermal conductivity and excellent solubility
L-6887	0000	0000	0000	0000	000	000	Excellent polyol/pentane solubility - can provide very fine cells for discontinuous applications especially refrigerators
L-6884	0000	000	00	0000	000	000	Can improve polyol/pentane or HFO compatibility - can provide very fine cells and good flow, for refrigerators and all discontinuous applications
L-6866	0000	00	00	0000	000	0000	For pentane-blown refrigerators and discontinuous panels to reduce surface voids formation, while still delivering excellent lambda value
L-6988	0000	00	000	000	000	000	Very fine cells with pentane and HFO/HC, increase froth shear stability thus reducing voids formation, good storage stability in acidic condition
L-6904	0000	00	0000	0000	0000	000	Strong emulsifier, fine cells with all blowing agents - continuous and discontinuous applications
L-6889	000	0000	000	0000	0000	000	Very high polyol-pentane solubility for excellent blend stability, good flow and void reduction
L-6112	00	0000	00	000	000	0000	High-purity silicone, can be used with hydrocarbons or HFO, produce foams with good dimensional stability, low voids, and good fire properties
Y-16533	00	0000	00	000	0000	000	High-purity silicone, excellent storage stability with HFO, improved flow and fire properties

HFO = Hydroflouoro Olefin, **PIR** = Polyisocyanurate, **PUR** = Polyurethane, **HC** = Hydrocarbons Features: Strong = ••••, Moderate = •





SILICONES FOR CONTINUOUS APPLICATIONS

Silicones	Fine Cells	Pentane Solubility In Polyou	Ellowing Agents Emulsific Agents	Cell Stabilization	Foam Flow	Void Reduce.	Product Description
Metal Pan	el						
L-6620	0000	00	000	00	000	000	For HFO and pentane, good flow and dimensional stability
L-5440	00	0000	00	0000	000	0	For HFC's and pentane co-blown with water, good flow and dimensional stability
L-6633	000	000	000	000	000	000	Reduced foam voids formation in continuous and discontinuous applications
L-6645	00	00	00	00	000	0000	Excellent silicone properties offering a reduction in foam voids
L-6642	000	00	00	00	0000	000	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	Emulsis: Emulsis:	Flow/Flatton	Compressive Strees	Surface Quality.	Pentaner	Key Performance Benefit
PIR Flex Fa	ice						
L-5111	0000	000	00	0	00	С	Fine cells with mainly cyclo-pentane blowing agents - for PIR/PUR boardstock
L-5112	000	0000	00	00	000	n/i/c	Improves mixing quality and emulsification of pentane up to high usage level of iso- pentane, improved foam quality and yield, and reduced laydown defects
L-5151	000	000	000	000	000	n/i	Broad processing window silicone with good compatibility and flow in PIR formulations
L-5466	000	000	000	000	0000	n/i/c	Strong nucleation and stabilization can reduce surface voids when using gas-tight facings, helps compatibility with APP's
L-5141	000	000	0000	0000	0000	n/i	Good flow, good compressive, good surface finish
Y-16548	0000	000	000	000	000	n/i/c	Highest aged R-Value and TDRV
Y-16561	0000	000	0000	0000	0000	n/i	High aged R-Value and TDRV good compressive strength, and good surface finish

HFO = Hydroflouoro Olefin, **PIR** = Polyisocyanurate, **PUR** = Polyurethane, **TDRV**=Temperature Dependent R- Value Features: Strong = ••••, Moderate = •



SILICONES FOR ONE COMPONENT FOAMS

Silicones	Yield	Dimensional Stabili	Structure	Flow	Solubility	
L-5345	0000	000	000	000	000	E) e)
L-5348	0000	000	000	000	000	Н
L-5350	00	00	000	00	00	M
L-5351	0000	000	000	000	000	In Re
L-5360	00	00	000	00	00	B
Y-16371	0000	00	0000	0000	000	E) ra
Y-16450	0000	0000	000	0000	000	In
L-5388	0000	00	000	0000	00	E) pi
L-6164					0000	V

Product Description

Excellent candidate for fine cells and good dimensional stability performance. Can provide excellent performance in summer/winter formulations with high levels of fillers

ligh froth volume, good compatibilization, and excellent storage stability

Multipurpose stabilizer mainly for straw foam applications

Improved miscibility of components, smooth flow, fine cells, and good dimensional stability. Recommended for high-yield foams, winter grades and formulations, including chloroparaffin

Balanced properties in a variety of formulation types also when high levels of fillers are used

Excellent performances in winter conditions and premium foams. Easy flow and low expansion rate

mproved dimensional stability at low density, well balanced, easy flow and pop-corn like froth

Excellent for low-density foams, also open cells spray and packaging. Wide compatibility with polyethers and polyesters, strong foam stabilization

/ery efficient cell-opener and cell regulator, use level 0.1 - 0.7 % on prepolymer composition



SILICONES FOR SPRAY FOAM SYSTEMS

Closed Cells Spray Foam Systems

Silicones	k.Factor	Surface Finice	Flow	HFO Shelfs1 :z	Fire Resistant	Product Description
L-6972	0000	000	000	0000	0	Excellent thermal insulation properties, good flow and fine cells
L-6888	0000	000	00	0000	0000	Good thermal conductivity and surface quality. Improved fire performance
L-5107LF	0	0000	0000	0000	00	Excellent cell stabilization for improved mechanical properties and compressive strength
L-5420	00	00	00	00	0000	Medium-high efficiency silicone, wide processing latitude. Excellent cell stabilization
L-6110	0	00	00	000	0000	Good dimensional stability and fire properties
L-6642	0000	0000	000	0000	00	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
Y-16533	00	0000	000	0000	0000	High-purity silicone, excellent storage stability with HFO, improved flow and fire properties

HFO = Hydroflouoro Olefin

Open Cells Spray Foam Systems

Silicones	Fine Cells	Cellopenin	Cell Stabili _{tsae:}	Product Description
L-6186	00	0000	00	Open-cells systems, polyester or polyether-based, for densities up to 30 kg/m ³
L-6189	0000	000	000	Excellent for low-density foams, 10-15 kg/m³, water-blown, polyethers or polyesters-based, fine and homogeneous cell structure, good polyol solubility
L-5388	000	0	0000	Excellent for low-density foams such as packaging and OCF. Wide compatibility with polyethers and polyesters, strong foam stabilization
Y-16312	000	00	0000	Surfactant for improved yield and processing

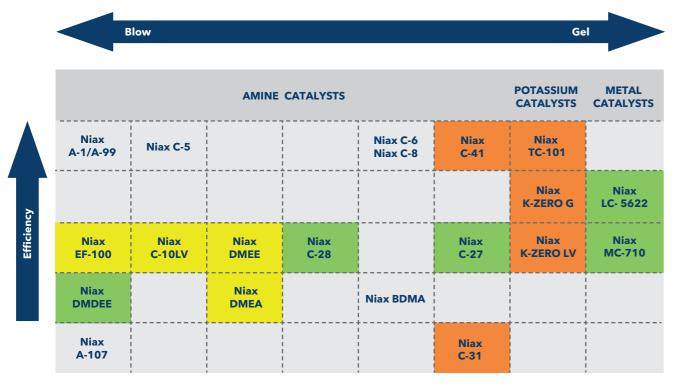
Catalysts	PUR Discontinuc.	Lamination 2.005	Lamination 2 Lous	Vater Blown PILC	Packaging, Oc.	Product Description
A1/A-99	0	0	0	0	0	Very effective blowing catalyst, promote selectively water-NCO reactions, can improve foam flow and rate of expansion
C-5	0	0	0			General-purpose blowing catalyst
EF-100	0	0	0	0	0	Reactive blow catalyst, excellent candidate for applications where low odor is a relevant feature
C-8	0	0		0	0	General-purpose PUR catalyst
C-10LV		0	0	0	0	Reactive amine catalyst, ideal for spray and open-cell applications. Blowing catalyst giving a smooth reaction profile, good candidate also in flexible molded foams
BDMA	0	0		0	0	Dimethylbenzylamine, weak gel catalyst, can reduce surface friability and can improve foam adhesion in particular with mainly water-blown foams
DMEA	0	0				Moderate odour, typically cost-effective, reactive catalyst
DMEE	0			0	0	Moderate odour, typically cost-effective, reactive catalyst, more blowing efficiency compared to DMEA
DMDEE	0				0	Moderate-activity blow catalyst, excellent storage stability also in isocyanate and prepolymers, 1K/OCF foams
C-27	0	0	0	0	0	Low odor catalyst offering improved shelf life for water co-blown systems
C-28	0	0	0	0	0	Balanced blow-gel catalyst, good shelf life with HFO-1233zd
C-31	0	0	0	0		Delayed-action catalyst for PIR and PUR, improve green strength and surface curing, reduce post expansion in thick panels
C-41	0	0	0			Strong gel catalyst promoting both PUR and PIR reaction, promote fast crosslinking, can reduce demold time and improve foam adhesion
A-107	0			0		Acid-blocked delayed-action blow catalyst
MC-710					0	Bismuth-based catalyst, exhibiting strong gel catalytic activity

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

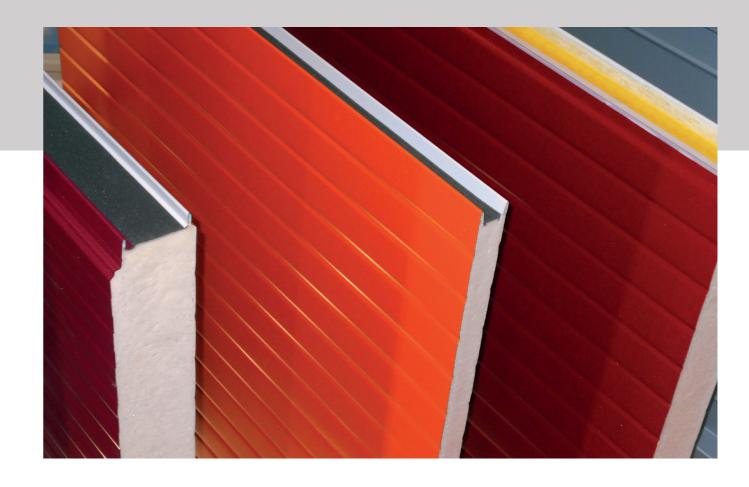
Catalysts Niax Special Addi	PUR Discontinue	PIR Discontinuous Panels	Lamination of	Spray	Water Blown Plin	Packaging, Oc	Product Description
RA-1		0	0		0		Can speed up foam hardening and adhesion without influencing gel time, in particular for PIR foam made with aromatic polyester polyols
AP-01	0	0	0		0		Adhesion promoter additive, can reduce surface friability in high water and/or high index formulations
FRP Polyols	0	0	0	0	0	0	Halogen free additives to help improve fire properties in both PUR or PIR foams
NA-01			0				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

Niax Catalysts for Rigid Foams Applications



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



NIAX TRIMERISATION CATALYSTS

Catalyst	Viscosity (typical value @ 25 °C)
Potassium Octoate LV	2200-2800
Potassium Octoate	5000-7000
K-ZERO G	3000
K-ZERO LV	600
Potassium Acetate	120
TC-101	180

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

Product Description

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

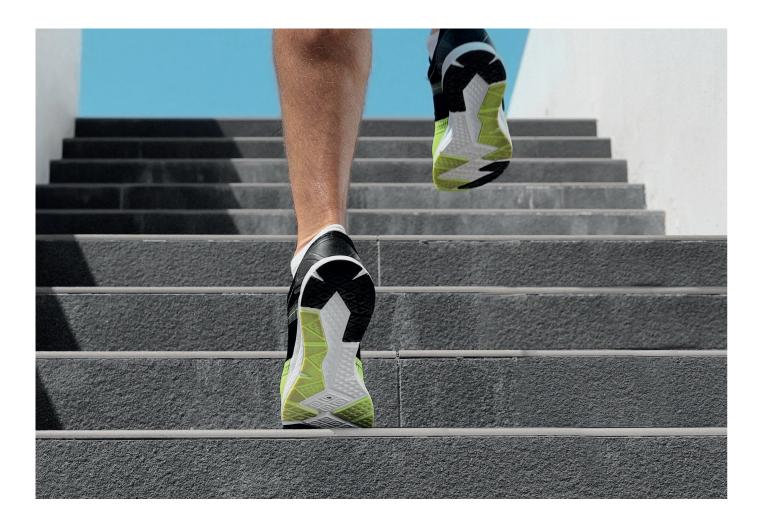
Potassium-based trimerisation catalyst, 15% K, also used as curing additive in PUR formulations for lamination

Glycol-free potassium octoate, reduced MDI use and improved cell isotropy in the production of PIR panels

Glycol-free potassium octoate, reduced MDI use, low viscosity to facilitate in-line metering

15% K containing PIR catalyst

Trimerisation catalyst based on a non-reprotoxic salt, increased efficiency and enhanced trimer conversion versus standard octoates. Low viscosity to facilitate on-line metering





NIAX SPECIALTY APPLICATIONS

NIAX SILICONES

Silicones	Microcellular (Polyeth, ular	Microcellular (Polyocellular	SRIM/Com.	Integral Skin Foam	PU Leather/Coatings	wechanical Froth
L-1500		0				Standard su
L-1501	0	0				Wide proce
L-1507	0	0		0		Low-density (> 0,3 g/cc)
L-1568	0	0		0		Low density skin and fin
L-1541		0	0			High-densi
L-1510	0		0	0		General-pu
L-5309J	0		0	0		Surfactant
L-5306	0			0		Low VOC st
L-5302	0		0	0		Medium-st polyether-b
L-1131					0	Cell stabiliz DMF and w
L-1160					0	Linear reac leveling in
L-1169					0	Linear reac
L-5614					0	Industry-st
L-5617					0	Low VOC su
L-5639					0	A low VOC r reducing bo
L-5690					0	Co-surfacta mechanica
L-5641					0	Low VOC su

HFO = Hydroflouoro Olefin

POLYURETHANE COATINGS, ADHESIVES, SEALANTS, AND ELASTOMERS (CASE)

Product Description

surfactant for microcellular systems (PES)

cessing lattitude with excellent open cells for low-medium density systems

ty polyester or polyether-based microcellular systems with excellent emulsification

ty (0,25-0,35 g/cc) polyester or polyether based microcellular systems, good stabilization, ine cell structure

sity polyester-based microcellular systems with thick skin and SRIM applications

purpose surfactant for polyether shoe sole and rigid foam systems, low freezing point

t for I-skin with HFO or CP, medium-low stabilization, good open foam content

strong stabilizing surfactant for I-skin and high-density microcellular applications

stabilizing surfactant can be considered for use in integral skin and high-density -based microcellular systems

lizer for wet process PU leather, provides good deposition, increases thickness, speeds up water exchange

active silicone, enhance anti-sticking property, good solubility in PU system. Improves n coating application

active silicone, enhance anti-sticking property, good leveling, and silky hand feeling

standard surfactant for the mechanically frothed foam process

surfactant analog of L-5614, used in the mechanically frothed foam processes

mechanical froth surfactant, non-hydrolysable, provides high closed cell content while both froth density and shear induced-cell collapse

tant that enhances froth stability and reduce foam density when used with standard cal froth surfactants

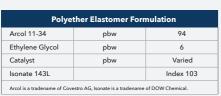
surfactant for increased closed cell content and decreased density (< 300 kg/m³)

NIAX AMINE & SPECIALTY CATALYSTS

Catalysts	Microcellul	SRIM 12	EL EL	Spractomers	Inter-	- ^y al Skin Foam PU Leather/Coatings	Product Description		PotLife	Curing Speed Hydrolytic Stabil:	()
A-440	0	0			0		Delayed-action, blowing-selective amine catalyst developed for microcellular foams	2	2	4	
A-533	0	0	0	0	0	0	Industry-standard TEDA catalyst in (mono)ethylene glycol	1	4	4	
A-535		0	0			0	Delayed-action gel catalyst for microcellular/SRIM/PUL applications	3	3	4	
A-575	0	0	0		0		DBU based temperature activated, delayed-action, powerful, gelling-selective catalyst	3	2	4	
A-577		0	0		0		Delayed-action, powerful, gelling-selective catalyst	3	2	4	
LC-5636		0	0			0	Heat-activated catalyst Sn/Hg/Ni free	4	1	2	
MC-710	0	0		0	0	0	Enhanced reactivity and stability over MC-810	1	4	3	
MC-810	0	0		0	0	0	Tin free metal based catalysts, strong gelling, can replace DBTDL	1	3	2	
LC-2901						0	Heat-activated catalyst for isocyanate binder formulations (Sn-free)	3	2	4	

4 = more ; 1 = less

30000 25000 viscosity cPs 20000 15000 10000 5000 0 200 400 600 800 0 Seconds



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.



••• Visc. A-535 at 0.25 pph

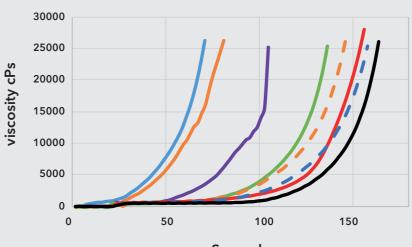
36 at 0.5 pph	
at 0.30 pph	
36 at 1.0 pph	
54 at 0.017 pph	
29 at 0.021 pph	
t 0.33 pph	

NIAX METAL CATALYSTS BASED ON SN

Catalysts	, in the second s	Ela.	Leath.	One Short	Elastomers	Product Description		^{rot} Life	Hydroi.
	8		/ ¹ / ¹	/ క్			/		Hyd
LC-5601	0	0	0	0		Good hydrolytic stability and moderate high activity. Can be used for molded foams	1	3	4
LC-5604	0	0	0	0		General-purpose organotin catalyst (DBTDL)	1	4	1
LC-5606	0	0	0	0		Moderate hydrolytic stability and delayed reactivity. Good for long flow applications	2	2	3
LC-5611	0	0	0	0		General purpose, high performance organotin widely used in polyurethane CASE applications	1	2	2
LC-5622	0	0	0			Higher active organotin analog of Niax LC-5632, especially suitable for HFO-containing formulations	1	4	3
LC-5628	0	0	0	0	0	Highest active organotin catalyst, low freezing point	1	4	1
LC-5629	0	0	0			Most delayed organotin catalyst, improved flow, can be used in mechanical frothed foam applications	2	3	2
LC-5632	0	0	0			Organotin catalyst with very good hydrolytic stability	1	4	3
LC-5638	0	0	0	0		Organotin catalyst with moderate activity compared to Niax LC-5604 for improved flow combined with an improved hydrolytic stability	1	4	2
LC-5650	0	0	0	0	0	Organotin catalyst analog to Niax LC-5628 with improved hydrolytic stability	1	4	2
LC-5654	0	0	0			More active organotin catalyst analog to Niax LC-5629 with powerful end-cure activity at elevated temperatures	2	3	2
LC-5659	0	0	0	0		General-purpose organotin catalyst (DOTDL)	1	4	2

HFO = Hydroflouoro Olefin

4 = more ; 1 = less



Seconds

 Visc. MC-710 at 0.03 pph
Visc. LC-5604 at 0.018 pph
 Visc. A-533 at 0.30 pph
 Visc. LC-5654 at 0.017 pph
 Visc. LC-5628 at 0.014 pph
 Visc. LC-5622 at 0.02 pph
 Visc. LC-5632 at 0.021 pph
 Visc. LC-5659 at 0.021 pph



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