

## Niax\* catalyst A-33

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#### Description

Niax catalyst A-33 imparts a high level of activity and good physical properties to flexible foam systems. Optimum performance of this catalyst can be achieved when it is used in conjunction with Niax catalyst E-A-1 or Niax catalyst A-10 in flexible foam formulations.

#### Typical Physical Properties

Specific Gravity at 20°C (68°F)	1.033
Average Weight per Gallon, lb	8.59
Viscosity, cP	
at 0°F (-17.8°C)	7000
at 36°F (2.2°C)	700
at 75°F (23.9°C)	100
Solubility at 20°C (68°F)	
in Water	Infinite
in Urethane-Grade Polyol	Completely miscible
in Fluorocarbon Polyol	50% by wt
Vapor Pressure, mm Hg	
at 100°F (37.8°C)	2
at 200°F (93.3°C)	17
at 300°F (148.9°C)	65
Flash Point, Pensky-Martens Closed Cup <sup>(1)</sup> , °C (°F)	88 (190)
Storage Life	Unlimited in enclosed container

(1) ASTM D 93

#### Processing Recommendations

Niax catalyst A-33 was evaluated using bench foam techniques. The effects of varying tin at constant amine and varying amine at constant tin were both evaluated. The ranges of tin and amine concentrations were well within the “operating range” of each. The dependent variables measured were: reactivity, top collapse, height of rise, breathability, density, cell count, and foam hardness (IFDs). Top and bottom gradients for breathability and density were defined.

Table 1 shows the foam screening formulation and foaming conditions. Table 2 provides evaluations of the foams produced at various tin and amine levels using Niax catalyst A-33 and a Niax catalyst A-10/Niax catalyst A-33 blend.

**Table 1: Test Foam Formulation and Foaming Conditions**

Foam Formulation	Parts by Wt
3000 MW EO/PO Polyol	100.0
CFC-11 Blowing Agent	5.0
Methylene Chloride	3.0
Water	4.5
Amine Catalyst	Varied
Niax Silicone L-580	1.5
Stannous Octoate, D-19	Varied
Toluene Diisocyanate (TDI), 80:20	
Index	114
Parts	59.7
Bench Foaming Conditions	
Polyol Charge, g	600
Mixing Speed, rpm	2700
Box Size, in	14 x 14
Oven Curing Temperature, °C (°F)	125 (257)
Oven Curing Time, min	10

**Table 2: Properties of Foam with Niax Catalyst A-33**

	Niax Catalyst A-33					Niax Catalyst A-10/A-33 <sup>(1)</sup>				
Amine Level	0.26	0.26	0.26	0.21	0.31	0.25	0.25	0.25	0.20	0.30
D-19 Level	0.22	0.25	0.28	0.25	0.25	0.22	0.25	0.28	0.25	0.25
Polyol Temperature, °F (°C)	74 (23.3)					74 (23.3)				
Cream Time, sec	14	13	12	14	12	13	13	12	13	12
Rise Time, sec	101	96	93	102	92	102	97	93	102	92
Top Collapse, in	0.4	0.4	0.4	0.3	0.2	0.4	0.3	0.3	0.3	0.2
Height of Rise, in	13.0	13.0	13.2	13.0	13.1	13.0	13.0	13.4	13.1	13.2
Cells per in	45–50					45–50				
Breathability, SCFM										
Top	5.5	5.2	4.7	5.2	4.7	5.5	5.2	4.7	4.7	5.2
Middle	3.0	2.3	1.6	2.3	2.3	2.9	2.5	1.8	2.0	2.3
Bottom	0.9	0.7	0.6	0.7	0.7	0.8	0.7	0.6	0.7	0.7
Density, pcf										
Top	1.13	1.10	1.12	1.11	1.12	1.13	1.09	1.09	1.10	1.10
Middle	1.13	1.12	1.13	1.11	1.13	1.12	1.10	1.11	1.11	1.11
Bottom	1.25	1.24	1.23	1.23	1.24	1.23	1.20	1.21	1.21	1.21
IFD, 12 in x 12 in x 4 in, lb										
25%	30	28	31.5	29	28	28	31	32	32	30
65%	53	51	55	50	50	55	53	57	57	54

(1) 3/1 Blend

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