CNSL-BASED PU FOAMS
GUIDE FORMULATIONS

PUR APPLIANCE PANELS WITH CNSL BASED POLYOLS

GX-9102/NX-9001 (PU2-CNSL) or NX-5285 (PU5-CNSL) as replacement for o-TDA initiated polyether polyol:

- Better thermal properties than petro-based polyol
- Lower exothermicity
- Faster reactivity and faster temperature release with shorter demolding time

Guide Formulations

Ingredients (Parts by wt)	PU-Ref	PU1-CNSL	PU2-CNSL	PU3-CNSL	PU4-CNSL	PU5-CNSL
Voranol RN490[1] (sucrose/glycerine initiated polyether polyol)	30					
Voranol RN482[1] (high func polyether polyol)	20					
Isoter 801SA[2] (propoxylated sorbitol polyether polyol)	24					
TD-405[3] (o-TDA initiated polyether polyol)	10			10		10
Elapol 80250[4] (aromatic saturated polyester)	4	4	4		4	
GX-9102[5] (CNSL Mannich Polyol)		10	7		7	
NX-9001[5] (CNSL Novolac Polyol)			3			
GX-9104[5](CNSL Mannich Polyol)				4		
GX-9006[5] (CNSL Novolac Polyol)					3	
NX-5285[5] (CNSL Aromatic Polyol)						4
Dabco DC193[6]	1					
DMCHA	1					
Tegoamin A-33[6]	1					
Cyclopentane	9					
pMDI Index	105					
Mix Time (sec)	10					
String Time (sec)	86	59	61	70	46	49
Tack Free Time (sec)	110	84	91	88	70	80
Density (kg/m3)	48.4	48.7	49.4	50.3	46.4	48.8
Exothermicity (°C)	133.8	129.5	106.2	112.7	120.8	129.9
Compression Parallel (kPa) Vertical (kPa)	293 261	255 253	248 259	280 270	265 233	269 255
Thermal conductivity (W/(m·K))	0.0257	0.0274	0.0253	0.0264	0.0295	0.0250

[1] Dow Chemical [2] COIM [3] Kukdo [4] Elachem [5] Cardolite [6] Evonik

PROCESSING

On lab scale, polyurethane formulations are prepared by properly weighing all the Part B components (polyols, catalysts, silicone, flame retardant additives, water) in a paper cup or in a plastic container. The mixture is then stirred for 600 rpm for 1.5 minutes. pMDI (Part A) is weighed in a different container (typically a paper cup). The correct amount of the blowing agent is then added to Part B, mixed for 10-15 seconds till a homogenous mixture is obtained. Part B's weight is then controlled to check whether any blowing agent loss has occurred during mixing. If so, the necessary amount of blowing agent is added. Part A is then poured onto Part B and the resulting mixture stirred at 2000-3000 rpm (depending on mechanical stirrer type) for the proper amount of time (some seconds, depending on systems reactivity). The resulting mixture is then poured in a mold (wood or metal one) to record the reactivity or left freely rising (e.g. for spray systems).

Please refer to each supplier's material safety data sheet (MSDS) for the most current safety and handling information.

DISCLAIMER

Cardolite
Chemistry for Tomorrow

Cardolite Corporation
140 Wharton Rd
Bristol, PA 19007
United States of America
T: +1-800-322-7365
www.cardolite.com