



The Andur Report



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Comparison of Various Anti-stat Additives

When it comes to anti-static additives for urethane materials, there are a couple of different types of functional materials that can be used.

One type is based on liquid quaternary ammonium compounds which are usually diluted in some type of carrier such as a glycol. In these type of materials, the ammonium group finds its way to the surface of the urethane and attracts water to make a thin layer that will dissipate static electricity as it builds up.

The second type of anti-stat comes in powder form and is based on carbon black or other forms of carbon and since carbon has some conductivity, the parts are able to dissipate

the static due to that. Below is a table with data comparing two quaternary ammonium compounds with a carbon black-based

antistat. The carbon black material is much more effective at lowering the surface resistivity.

Surface Resistivity of a 95A TDI/PTMEG/MBOCA Elastomer

Additive	Additive type	Level	Surface Resistance
None		0%	4.6 x 10 ¹²
Vulcan® XC-72R	Carbon black	5%	1.4 x 10 ⁴
Vulcan® XC-72R	Carbon black	3.50%	4.6 x 10 ⁴
Vulcan® XC-72R	Carbon black	2.50%	1.7 x 10 ⁴
Vulcan® XC-72R	Carbon black	1%	5.2 x 10 ⁵
Vulcan® XC-72R	Carbon black	0.50%	5.6 x 10 ⁷
Vulcan® XC-72R	Carbon black	0.25%	4.1 x 10 ¹²
Solstat® P-107	Quaternary ammonium	1%	4.4 x 10 ¹⁰
Solstat® P-107	Quaternary ammonium	2%	2.9 x 10 ¹⁰
Solstat® P-107	Quaternary ammonium	4%	2.0 x 10 ¹⁰
Solstat® P-107	Quaternary ammonium	6%	2.6 x 10 ¹⁰
Solstat® P-107	Quaternary ammonium	8%	1.0 x 10 ¹⁰
Solstat® P-107	Quaternary ammonium	10%	1.2 x 10 ¹⁰
Catafor® PU	Quat. ammonium in BDO	2%	1.5 x 10 ¹⁰
Catafor® PU	Quat. ammonium in BDO	6%	7.0 x 10 ⁹
Catafor® PU	Quat. ammonium in BDO	10%	9.0 x 10 ⁸

Vulcan is a trademark of Cabot Corp.; Solstat is a trademark of Lubrizol Corp.; Catafor is a trademark of Solvay

New Product: Andur Glide 4830

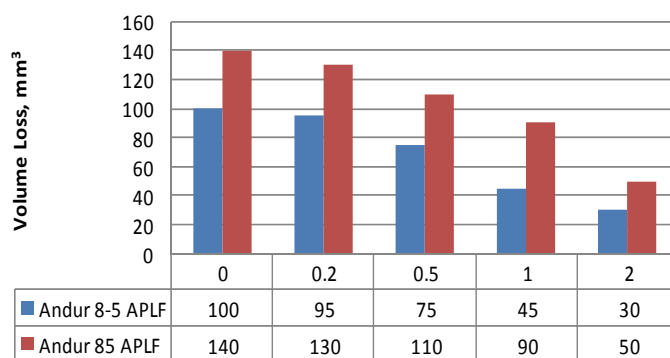
Andur Glide 4830 is a new additive being offered by Anderson Development. It is a PTFE-modified wax compound that is diluted in an aliphatic hydrocarbon to 32% solids. Based on rotary drum abrasion testing, the Andur Glide 4830 enhances the abrasion resistance by a factor of three with 2% addition.

The table below illustrates this abrasion improvement with two mate-

rials: an 85A LFTDI-PTMEG-MBOCA and an 85A LFTDI-polyester-MBOCA. In both cases, with only 2% added,

the volume loss is significantly lowered. A technical datasheet is available.

Volume Loss vs. % Andur Glide 4830



Catalyst Recommendations for Various Curene and Other Curatives

Catalyst Typical Addition*	Organic Acid 0-2%	Tin-based 0-0.1%	Bismuth-based 0-0.2%	Tertiary Amine 0-0.5%
Curene 442	X			
Curene 89	X			
Curene 107	X			
Curene 185	X			
Curene 280	X			
Curene 3005	X			
Curene 45		X	X	X
Curene 49		X	X	X
Curene 64		X	X	X
Curene 93		X	X	X
1,4 Butanediol		X	X	X
TMP		X	X	X
HQEE		X	X	X

*addition amount based on prepolymer

Catalyst Examples:

Organic Acid: Oleic acid, Azelaic acid (solid), Adipic acid (solid)

Tin-based: Dabco® T-12 (dibutyltin dilaurate), Dabco T-9 (stannous octoate)

Bismuth-based: Coscat® 83 (bismuth neodecanoate)

Tertiary Amine: Dabco® 33LV (triethylenediamine)

For amine curatives, use an organic acid; for hydroxyl curatives, use a metal catalyst such as a tin or bismuth-based catalyst

General Rule of Thumb: For amine curatives, use an organic acid; for hydroxyl curatives, use a metal catalyst (tin is typically the strongest) or a tertiary

Dabco is a trademark of Versum Materials (formerly Air Products and Chemicals)

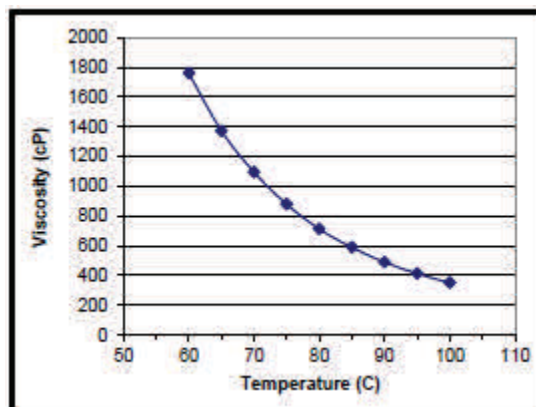
Coscat is a trademark of Vertellus Specialties, Inc.

New Product: Andur CL 7-2 APLF

Andur CL 7-2 APLF is another addition to the low free TDI polycaprolactone family. This prepolymer yields a 68-76A elastomer when cast with Curene 442 (MBOCA). The potlife is quite long so catalyst (oleic acid) is recommended if a shortened demold time is desired. Physical properties and a viscosity curve can be seen to the right. A technical datasheet and samples are available.

Elastomer Processability and Properties

Potlife, min.	>20
Shore Hardness	72A
Tensile, psi	4200
Young's Modulus, psi	2050
100% Modulus, psi	380
300% Modulus, psi	665
Elongation, %	490
Die C Tear (D624), pli	240
Split Tear (D1938), pli	100
Compression Set	20
Bashore Rebound (%)	45



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Mission Statement

Anderson Development will be a global supplier of innovative specialty chemical products, striving for continual improvement in all of our operations. It is our goal to be personal, efficient, and responsive to our customers and employees. We will provide a team-oriented atmosphere while allowing for individual diversity among our employees.

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