The Andur Report

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Anderson Development Company

New Product: AndurGel OO 50

AndurGel OO 50 is a new room temperature curable, plasticizer free system that can achieve a wide hardness range. It is a very soft system that is primarily designed for applications that need a durometer of less than 30 Shore A. At a 1:1 ratio, AndurGel OO 50 is approximately 50 Shore OO, thus the name. To the right is a chart illustrating the ratio required for a durometer range of 45 OO (4A) to 78 OO (27A). The Part A can also be cured with Curene 107 to achieve a 70A. As the amount of Part B increases, the elongation and split tear also increase, but the rebound decreases.

At the higher ratios, the material behaves more like a energy dampening gel than an elastomer. This could be used in applications such as insoles for footwear where vibration and impact are a concern. Also, any applications where silicone is currently used could be a good fit.

The Part A can be cured with Part B-1 (1 minute potlife at room temperature) for applications requiring quick cure and demold, or Part B-10 (10 minute potlife at room temperature) for hand casting situations. A technical datasheet and samples are available upon request.

Hardness: +/- 5 OO, 3A		
Ratio - A:B	Shore OO	Shore A
1.28:1	78 OO	27A
1.16:1	75 OO	22A
1.11:1	70 OO	17A
1.06:1	65 OO	12A
1:1	52 OO	6A
0.97:1	45 OO	4A
Curene 107	****	70A

One possible application for AndurGel OO 50 is a cushioning gel.

Blocked Isocyanate System - Andur XP-499

Andur XP-499 is a blocked TDI-PTMEG prepolymer intended for use in film applications. It is blocked with MEKO, which has an unblocking temperature of approximately 120-130C. The cure time will depend on film thickness, but is typically less than 1 hour. The system is diluted in the solvent glycol ether PM acetate which helps to lower the viscosity. During deblocking, the solvent is evolved along with the MEKO, so precautions to handle the vapors must be taken. The %NCO of the material is ~6.9% nominal when deblocked. The TDI content before it is unblocked is less than 0.15%. The viscosity is approximately 2000cP at 50C. A stable mixture with a curing agent such as a diamine is possible, which gives the user a wide processing window. When cured, a high modulus film can be achieved.

Happy Holidays from ADC!

Physical Properties at Elevated Temperatures

The properties of urethane elastomers at elevated temperatures are lower than at ambient temperatures, as one might guess. At higher temps., the material is softer, elongates farther, and has decreased strength, but how much do the properties decrease? The tables to the right have several 90-95A systems of various backbones and isocyanates. They show how hardness, modulus, tensile strength, and split tear decrease at 150F and 200F. At 90-95A, the hardness is fairly stable up to higher temperatures, since most products will have a flat modulus curve. Most materials decreased 3 Shore A units on average at 200F, though 2-90 AP has excellent retention and keeps it hardness up to 200F. The 100% modulus follows the hardness trend.

The lower table illustrates the effect of heat on tensile strength at break and split tear. Since materials stretch farther when they are hot, some of the material didn't break before exceeding the maximum extension of the test frame, so they have no value in the tensile columns. The specimens that have measureable break in tensile strength were quite a bit lower than at room temperature, with 54% being the best retention. For split tear retention, the variance was very high. Some materials had low retention, will others were half or greater. The trend between 150F and 200F is about 10-20% for the drop. The main point to take away from the data is that the physical properties of any typical urethane are much lower at 150F and 200F, so consideration must be given to application temperature when selecting a material.

Drop in Hardness and %Retention of Modulus at 150F and 200F

	Hardness		100% Modulus (psi)	
	150F	200F	150F	200F
2-90 AP / Curene 442	0	0	97%	96%
AL 92 AP / MCDEA	-2	-3	79%	69%
M-25 / BDO	-2	-3	84%	77%
BD 78 AP / Curene 107	-2	-4	84%	72%
AL 90 AP / Curene 89 LC	-1	-2	89%	83%
9 APLM / Curene 107	-3	-4	79%	70%

%Retention in Tensile Strength and Split Tear at 150F and 200F

	Tensile Strength at Break (psi)		Split Tear (pli)	
	150F	200F	150F	200F
2-90 AP / Curene 442	48%	35%	53%	32%
AL 92 AP / MCDEA		54%	73%	51%
M-25 / BDO		24%	27%	15%
BD 78 AP / Curene 107			72%	64%
AL 90 AP / Curene 89 LC	57%	39%	57%	48%
9 APLM / Curene 107			47%	31%

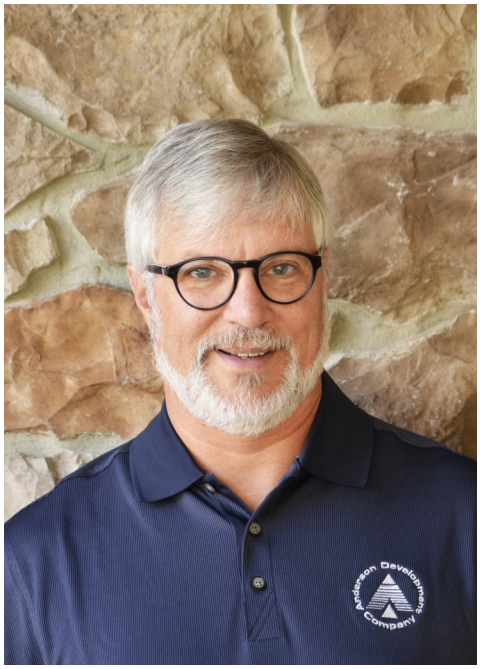
ADC Testing capabilties

In R&D, we have many tools at our and our customers disposal. In early 2018 we will have another load frame (Instron) come on line, giving us additional testing flexibility. We have the capability to identify unknown materials from a competitor, evaluate physical properties on a cast material, or even perform something as simple as running the %NCO on an old prepolymer. To the right is a list of tests we routinely perform for our customers.

- ASTM tests
  - D412 Tensile Strength
  - D624 DieC Tear
  - D1938 Split Tear
  - D395 Compression Set
  - D470 Tear
  - D575 Compresssion-Deflection
  - D790 Flexural Modulus
  - D968 Falling Abrasion
  - D1894 Coefficient of Friction
  - D2240 Durometer Hardness
  - D2632 Bayshore Rebound
  - D5963 Abrasion Resistance
- Other tests
  - %NCO check
  - Polymer Identification (various methods used)
  - Tensile/Tear properties at temperatures other than ambient
  - DMA testing
  - Coefficient of Thermal Expansion
  - And many more!

ADC Urethane Sales Team Growth

In October, Jim Ressler joined the Anderson Development Urethane sales team. Jim comes to us from Stoner, Inc. where he spent many years working with mold releases. He has a B.S. in Chemistry and was an R&D chemist for Stoner for their mold release division. He then moved to sales and in that role became very familiar with the world of polyurethane, especially as it pertains to mold releases. It is this experience, a passion for learning and helping people that will make Jim a valuable asset to the Urethanes team. Welcome aboard, Jim!



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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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