



The Andur Report



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Recent Technical Papers

In April and September, ADC gave some technical presentations at the PMA Conference and the CPI Conference.

One of the papers was research on a curative for MDI systems called DiHEDS that is similar to butanediol, but contains the element sulfur in it. With the sulfur in it, we can measure the stoichiometry of a cured part via X-ray fluorescence which is what is currently done with MBOCA-cured parts.

The physical properties of MDI prepolymer cured with DiHEDS are good, giving properties similar to butanediol. Potlife is much longer with this curative, though, so extra catalyst needs to be used.

Processing Hints

Ever have problems with parts not looking the way they are supposed to or maybe your hardness is not right? I think everyone can say "yes" to this question. Figuring out what the problem is can be the hardest part sometimes.

A good thing to remember when troubleshooting bubble problems, part defects, or durometer issues, is to leave no stone unturned.

DiHEDS is manufactured by Chevron-Phillips and is commercially available.

The other paper given was about Cerenol® polyols. These polyols are very similar to PTMEG in structure, but are 100% renewable and derived from corn. The properties of these TDI-based, MBOCA-cured elastomers made with Cerenol® polyols are very good and as good as PTMEG. The other advantages they have are lower viscosity (much lower sometimes) and lower freezing point.

In particular, this paper highlighted the dynamic characteristics these elastomer have. Dynamometer testing was done and showed that the Cerenol® -based wheels last as long

as PTMEG wheels or longer. The disadvantage of this material is cost, but as it is made in larger quantities, it is expected that it will come down in price. Sample quantities are available of Cerenol® versions of our current conventional PTMEG prepolymers as well as LFTDI prepolymers.

For copies of either of these papers, contact any of the Urethane R&D staff.

Cerenol is a trademark of Dupont



- durometers
- Wrong curative equivalent weight used
- Vacuum degasser isn't powerful enough
- Too much mold release
- Many other "little" things

Sometimes it is a combination of these types of items that causes the issue, which makes troubleshooting the problem all the more difficult.

Other miscellaneous items ("little details") that sometimes cause trouble:

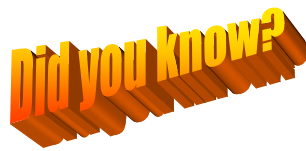
- Wet pigments
- Broken or uncalibrated

A Review of Who Pays for Which PPE?

OSHA's PPE standard (29 CFR 1910.132[h]) says that employers must pay for most types of PPE when used by employees exclusively in the workplace (that is, not for personal use at home or other nonworkplace activities).

The general rule of thumb is that you must pay for PPE whenever an OSHA rule explicitly requires it, such as for respiratory protection when air contaminant levels are above the PEL or hearing protection when noise exceeds established decibel levels. OSHA's "employer pays rule" also mandates that you pay to replace required PPE on a regular basis. But you don't have to pay for replacements whenever employees request it as long as the PPE is still in safe condition. If an employee purchases his or

her own PPE and is allowed to use it a work, you are not required to reimburse the employee for that purchase. You also don't have to pay for replacement PPE if the employee has lost the item due to negligence or has intentionally damaged the PPE (1910.132 [h][5]).



ADC's Polyurethane Product Guide is now on the web! Just go to andersondevelopment.com Click on "Polyurethanes", and then click "Visit our Polyurethane Product Guide" at the bottom. Find technical datasheets, help calculators, and much, much, more!

What You Have to Pay For

The following is a nonexhaustive list of PPE typically found in a PU shop you must provide at no cost to employees:

- Electrical protection
- Chemical protection
- Foot protection
- Eye and face protection
- Hearing protection
- Hand/arm/body protection
- Nonspecialty gloves (payment is required for PPE to protect from dermatitis, severe cuts/abrasions or other site-specific hazards)
- Respiratory protection

What You Don't Have to Pay For

Items exempt from the "employer pays" rule include clothes or items that are not worn by employees exclusively for protection from hazards, such as the following:

- Certain foot protection (nonspecialty safety-toe protective footwear, provided that the employer permits such items to be worn off the jobsite, steel-toe shoes, steel-toe boots, shoes or boots with built-in metatarsal protection that the employee chooses instead of metatarsal guards provided by the employer)
 - Nonspecialty prescription safety eyewear, provided that the employer permits such items to be worn off the jobsite
 - Everyday clothing (long-sleeved shirts, long pants, street shoes, and normal work boots)
 - Ordinary clothing and skin creams used solely for protection from the weather (e.g., winter coats, gloves, rubber boots, hats, raincoats, ordinary sunglasses, and sunscreen)
 - Back belts
 - Dust masks and respirators worn under the voluntary-use provisions of the PPE standard
 - PPE already owned and used voluntarily by the employee

Article taken from the PMA's Polytopics Newsletter

Miscellaneous Urethane Products Offered by ADC

Anderson Development has over 100 Andur prepolymers and over 20 Curene curatives that are in our product makeup. Did you also know that we sell plasticizers and other miscellaneous products that are used with our prepolymers and curatives?

Here is a list of some of these products:

- Plasticizers (Andurflex)
 - 9-88 SG (Benzoflex)
 - DOA
 - DOP
 - TXIB
- Misc. Curatives
 - PTMG 1000
 - TMP

- Catalysts
 - Oleic Acid

Other polyols (extenders) are available as well. Please contact customer or technical service with questions.

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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.

We're on the web!
www.andersondevelopment.com

Catalyst Study

In April of 2010, we started an involved study with our 70A polyester materials, curing them with TMP, Curene 49, and MBOCA/TMP blends to look at hardness stability over time. One thing we found is that if catalyst, such as T-12 is used to speed up the cure, then the hardness doesn't drift up over time as much from the initial durometer reading after postcure.

We then ran a second phase of the project to look at other factors such as mold temperature and postcure length. From this we found that when curing 70A polyester pre-

polymers with TMP or Curene 49 type products, and not using catalyst (for very long pour times and overnight demolds) that an extended postcure of 24-48 hours helps with hardness drift as well as using a mold temperature of 240-250°F.

Finally, we ran a phase 3 of the study and looked at adding very small amounts of catalyst that have almost no effect on potlife, but help immensely on getting the hardness to the proper number after demold much quicker. We used Dabco 33 LV as the catalyst since it is not as

strong as tin catalysts. The curative used was TMP since it is very slow curing which would be the worst case scenario. As you can see, very small amounts of catalyst, make big changes in the elastomer hardness over time. See the table below.

7 APLM/TMP/Dabco 33LV

Catalyst drops/175g	~Potlife minutes	Hardness - Shore A (212F cure)			
		Initial	1 week	2 weeks	3 weeks
0	long	36	41	52	55
0.5	100+	44	53	55.5	56
1	70-100	50	55.5	56	56
2	25-30	55	56	56	56
4	~20	55	56	56	56