



## Overview

- About 75% of 2006 attendance even with ANTEC and other co-located events.
- Almost same number of exhibitors, fewer demonstrations, fewer resin suppliers.
- Bioplastics (source & reactive) very evident.
- Less new things, but good for networking.  
(serves processors who don't buy but still run)
- Many firms competent though nothing new





### **China / Taiwan**

- 194 exhibitors vs 115 in 2006.
- Much extrusion machinery, e.g., Jwell (jay-well) = big stand, variety, huge catalog, rep in Canada
- Yellow Jacket (exWayne, now Steer) to be made in China
- Smart buying can save money in short run until best brands become better-known
- Chinaplas April 19-22, 2010





# Energy Saving

- Extrusion is very efficient.
- Motor efficiency, Davis-Standard compared DC/AC/Synchronous, ANTEC paper showed AC better than DC, but...
- Beware “percentitis,” calculate real money:  
1 Kcal = 0.001163 kW-hr  
1 Kcal = 4.186 KJ
- Separate out downstream, drying, and thermo-forming (not in extruder)
- Agentis does real-time energy audit of equipment





## Environment

### *Concept of “deselection.”*

- Problems with plastic bags, PVC.
- SPI to go on Internet, still won't ask why.

### *Green, sustainable, natural, bioplastic?*

- Bioplastics are/are not saviors?
- [www.bioplasticsmagazine.com](http://www.bioplasticsmagazine.com)  
(expensive, German, excellent English)
- Book by Endres & Siebert-Raths
- Mirel + Rubbermaid, ag films (fragments)
- IDES includes [Green Plastics Search](http://www.ides.com/green)  
([www.ides.com/green](http://www.ides.com/green))
- SPI forms Bioplastics Council (resins)





# Primary Machinery

- Most major US/Canadian/Euro makers represented, very few live demos...
- Higher speeds, smaller footprints, but nothing radically new at extruder end.
- M-A-S (Austria) twinscrew for recycling PET
- New maker of singles R & B, already does blow-molders.



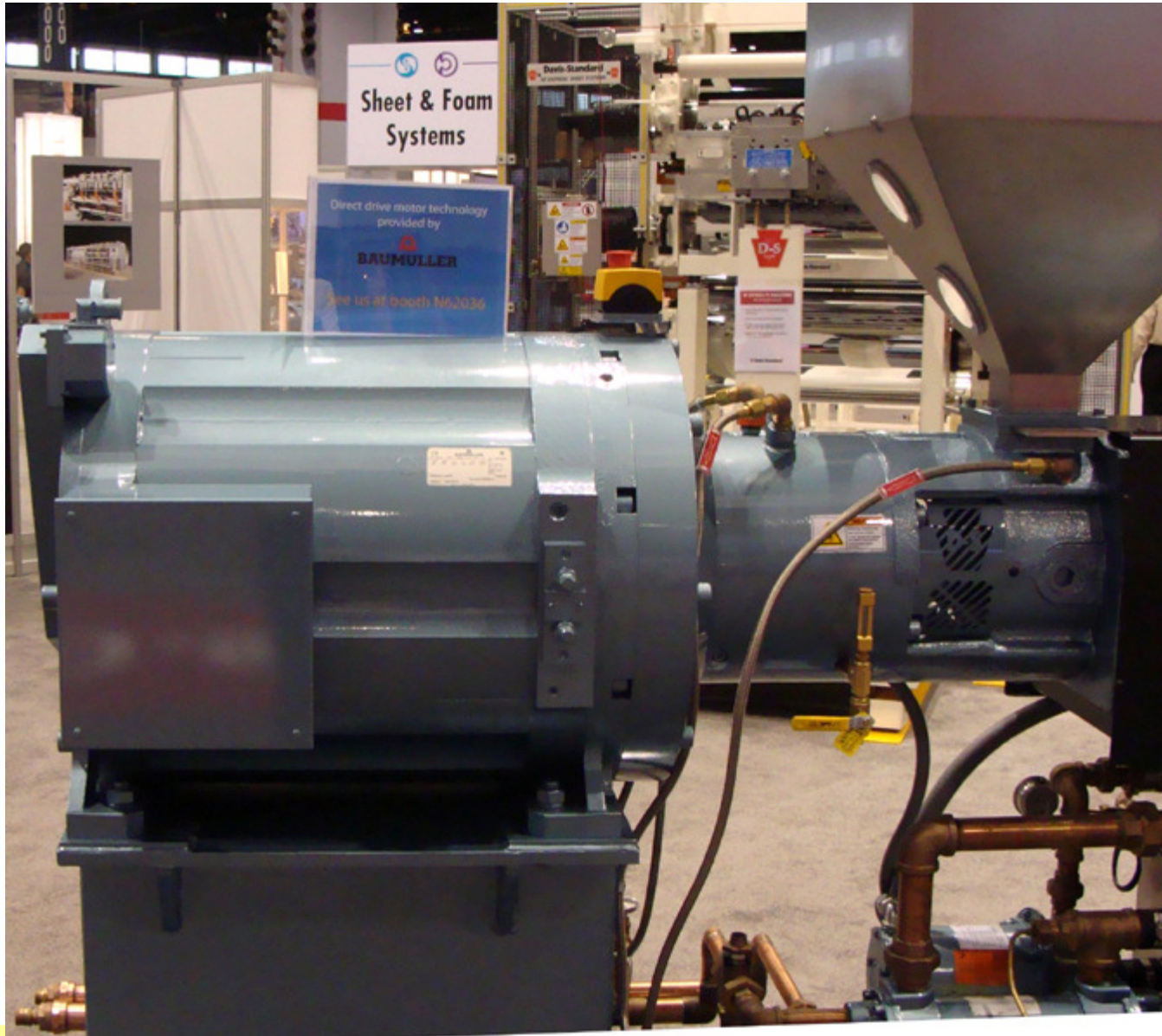


## Motors & Drives

- Plenty of gearless synchronous motors, some run very fast (1500 max) some much slower (150 max)
- Some “backlash” where makers supply familiar and efficient AC vector motors.
- No rush to retrofit yet, except maybe for old DC drives.



# SYNCHRONOUS (GEARLESS)





# Components

- Krauss-Maffei offers bimetallic twin barrels.
- Entek now makes replacement twin barrels.
- Xaloy induction-heated barrels for hi-temp materials, small extruders (more external heat needed).
- Many screw designs, Compuplast simulates dies and screws, including coex, need reliable flow data.
- Maag Synchro gear pumps for filled materials, two drives avoid abrasive contact.
- Gneuss has insulated screener (40%?).
- Pyropel polyimide insulation (Albany Intl).





# Barrier + Spiral Maddock





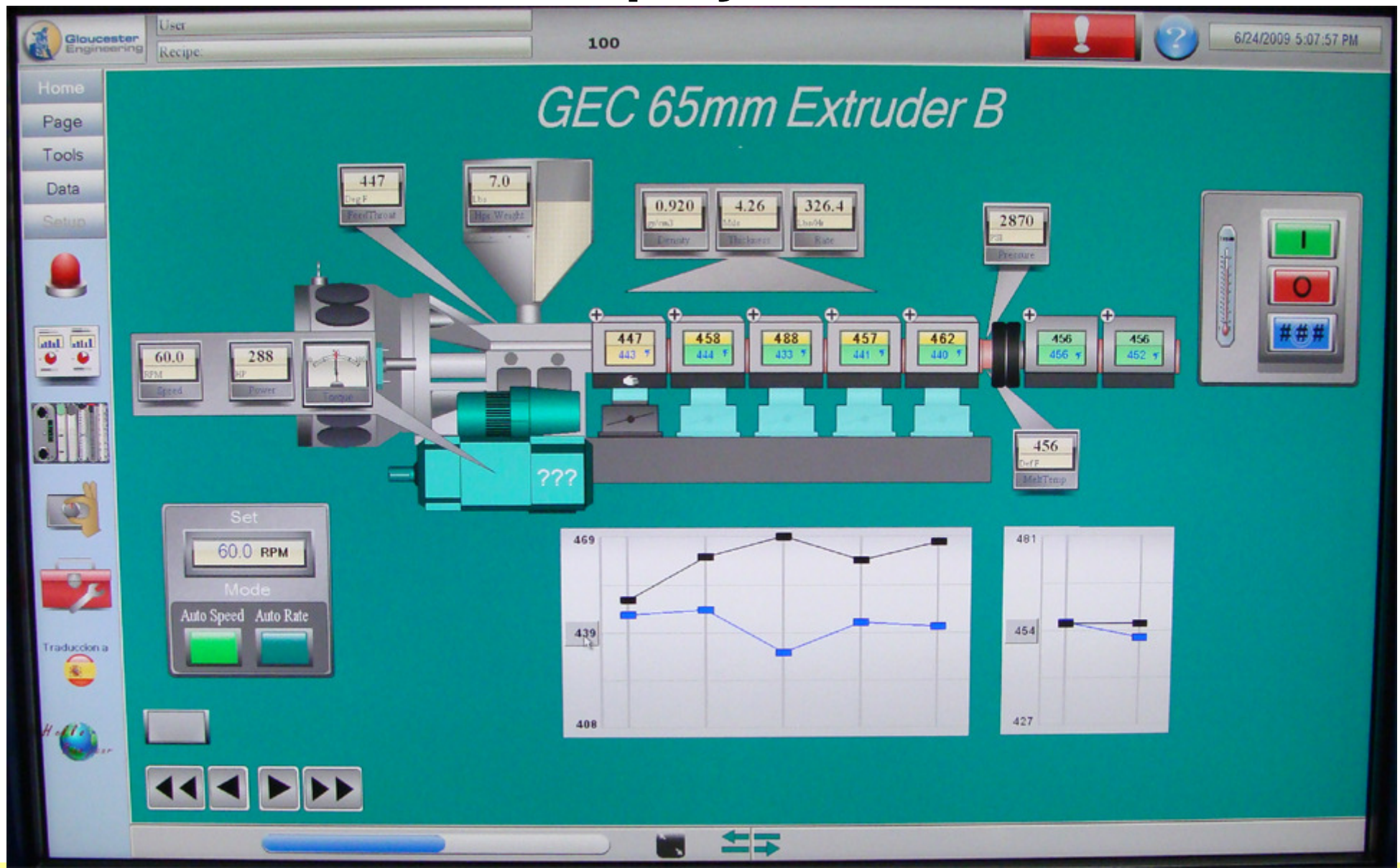
# Controls

- Data acquisition easy, very useful if read
- Davis-Standard React, send operating data long-distance: not new but easier now
- Syscon cameras on gauges, transmit signals.
- Dynisco T sensor on P gauge for more accuracy
- NRC (Canada) SIMIS ultrasonic mixing sensor
- K-Tron hopper vibrator senses when needed
- PTi machines talk to you (like some cars).





# Extruder Displays Sets & Gets





# Film

- Double air rings common, Macro patents expired.
- Macro 2 + 2 max diam 2 m, others 1 + 2.
- Macchi double has composite shell, keeps cool.
- Superfast stretch-film winders  
SML Austria, Gloucester, (live video from factory),  
D-S to 136", W & H.
- Macro Automax winds coex either side up.
- Kundig wireless thickness gauge.
- Macro and ISIS IR gauge sensors for multilayers.
- Plast-Control 2-sensor capacitance gauge and Mahlo beta-gauge allow variable air gap



## DUAL AIR RING





## Sheet

- EDI and Cloeren have microlayer dies.
- D-S lab line includes EDI, also gas injection to foam skins.
- EDI inner coating to resist chloride corrosion.
- Welex superspeed 1500rpm 3" 600HP, 40:1, vent.
- ISRA multicamera scanner for surface defects.
- UHMW-HDPE sheet piling wrap, award.





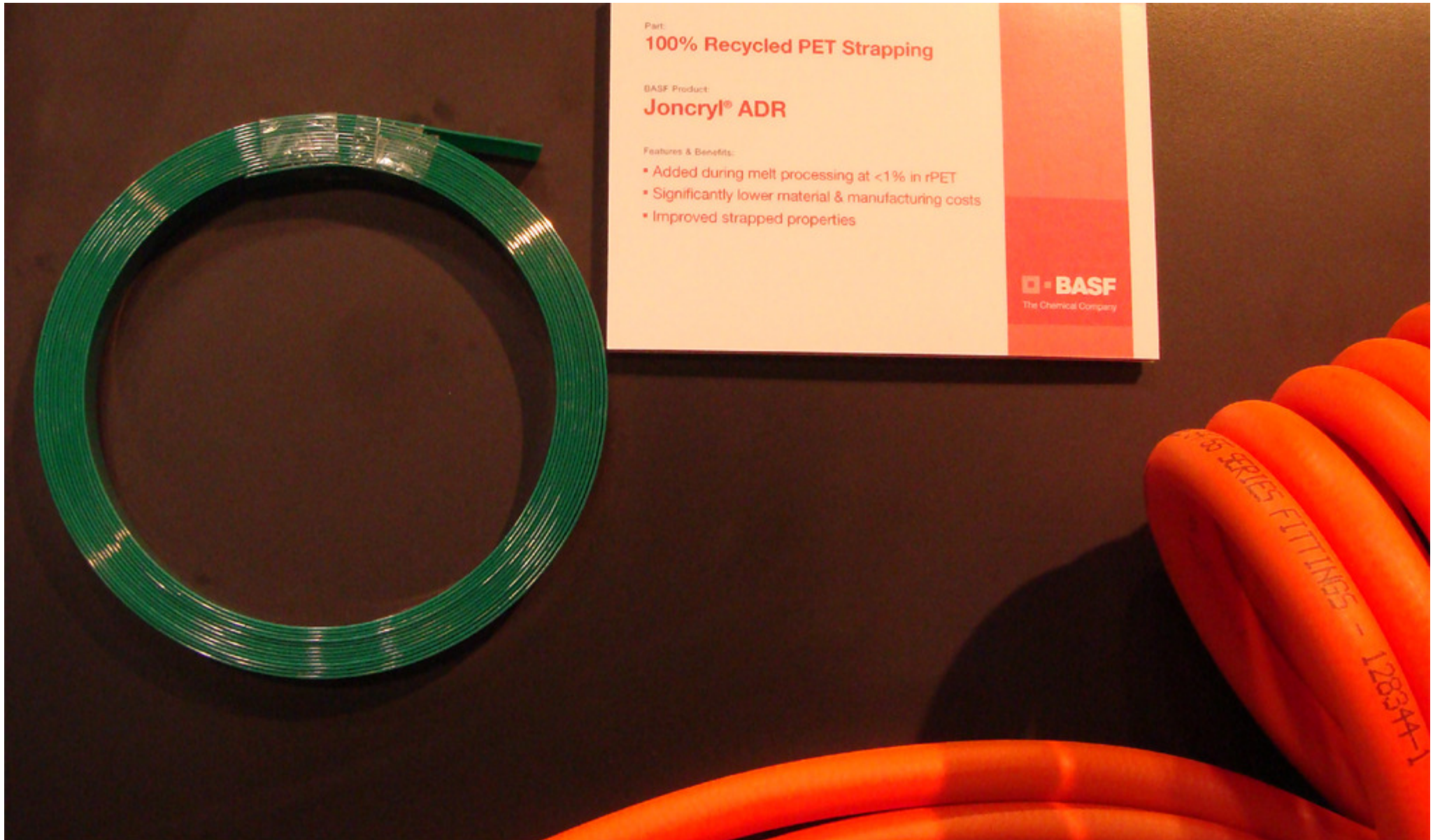
## Pipe & Profiles

- More shakeout in PVC window equipment:
  - Gruber buys Automated
  - Two Technoplasts (US/Europe)
  - Phoenix and Tooling Coach design, outsource mfg
  - Trinity (China) represented in US now
- Zumbach inspects pipe for visible defects down to 0.1 mm, up to 1500 ft/min
- On-line diameter changers: Rival, ConPro, KuAG
- Aspen /Andersen licenses wood profile know-how





## STRONGER rPET





## Extrusion Materials

- Too many bioplastics to list here (more than 200 available).
- Dandong Decheng (China) to sell CPE in USA as Dow closes their facility.
- Kraton Nexar for breathable nonwoven coating.
- PTI (OH) LNOc: grind rPET very fine, compress to tablets instead of remelt/pelletize.
- To purge or not to purge: abrasive, chem, “soft”?
- Foamed PET, see bottles, perpetual infancy





## Additives

- Americhem xCelmax crystallization accelerator, Shortens cooling time.
- Americhem minibeadd concentrates for easy flow but easier dispersion/mixing.
- Hi-temp blowing agents (for PET) and purges.
- Milliken Hyperform reinforces PP as well as clarifies.
- NanoBioTer, silvered antimicrobial nanoparticles.





## **SPE Antec**

Held during NPE, over 500 tech papers, many about extrusion, final program available at:

[www.4spe.org/sites/default/files/09final-program.pdf](http://www.4spe.org/sites/default/files/09final-program.pdf)

Worth the effort, contact authors for latest news.

### Examples:

- How to extrude PLA and PHBA/Mirel (Davis-Std)
- Microcellular PVC (Michigan State U)
- Venting instead of drying PC/PET (IKV Aachen)





Thank you for attending!

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