



TECHNICAL PROGRAM
Sheraton Inner Harbor
Baltimore, Maryland
May 27, 2010

2:00 PM **Seal Less High Pressure Metering Pump for Toluene-diisocyanate** Thomas P. Cushman
Cushman Engineering, Inc.

Abstract:

The integration of state of the art canned motor technology and the bent axis hydraulic pump inside a hermetic case is demonstrated to be an effective seal-less and leak free method of delivering a metered throughput of toluene di-isocyanate (TDI) to the modern foam machine mixing chamber. This technology eliminates the dynamic shaft seal as a source of fugitive emissions of isocyanates. All connections to the assembly are sealed with static seals. This technology is a viable method of protecting employees, the factory and the surrounding community by preventing nuisance leaks and subsequent fugitive emissions at the pump. An opening and brief overview of NIOSH regulations and hazards regarding TDI is included.

2:30 PM **'Free' TDI in PU Flexible Foam: Update on Recent Studies** Mark W. Spence
International Isocyanate
Institute, Inc.

Abstract:

Some researchers have reported presence of isocyanate in PU by non-quantitative colorimetric methods, as well as quantifiable residual toluene diisocyanate (TDI) monomer using analytical measurements involving solvent extraction and derivatization of fully cured PU products. In this study a rigorous methodology was developed to extract and quantify TDI from flexible PU foam. Furthermore influence of methodological variables was assessed and consideration was given whether extractable TDI represented free (unreacted) TDI in the polymer matrix, or if TDI was being regenerated by the analytical procedure. More exposure-relevant techniques for providing such data were developed; specifically, emission to air and migration to a surface in contact with the PU foam. Results showed that TDI can be extracted from a cured PU foam sample using a range of organic solvents and derivatizing methods. There is evidence that the detected TDI is, at least in part, an artifact of the solvent extraction methods. In both emission and migration tests no TDI was detected as being released from the foam sample. Consideration of the use of data for risk assessment of possible monomer in a PU product was made, with the conclusion that emission and/or migration study data are more relevant for development of risk assessments.

Break

3:15 PM **High Efficiency Silicone Surfactant for Flexible Slabstock Foam Applications** Gregory A. Pickrell
Momentive Performance
Materials

Abstract

In difficult economic times, when raw materials prices rise and demand is weak, foam manufacturers search for effective ways to improve foam production yield. Polyurethane additive suppliers can play a pivotal role in helping foam manufacturers achieve this initiative. This paper describes Momentive's new high efficiency Niax* silicone L-595, a surfactant to consider for providing higher yield foam as well as fine cell structure and wide processing latitude. The typical benefits of Niax silicone L-595, compared to generally used surfactants, have been exhibited in many batch and continuous machine line trials over a wide range of conventional flexible slabstock foam formulations in use throughout the world. This new surfactant can help optimize foam stabilization and enhance cell-opening characteristics, yielding higher foam buns with minimal density gradients, leaner top and bottom skins, integrated cells and excellent product quality consistency. In addition, this silicone stabilizer can be considered for use in manufacturing processes that use liquid CO₂ as auxiliary blowing agent.

*Niax is a trademark of Momentive Performance Materials Inc.

3:45 PM **Additive Flame Retardants Identified in Consumer Products and Furniture Containing Polyurethane Foam**

Heather H. Stapleton
Nicholas School of the
Environment, Duke University

Abstract

A majority of furniture and consumer products which contain polyurethane foam, manufactured both in the United States (U.S.) and abroad, are treated with additive flame retardants to meet flammability standards. The flammability standard which primarily drives this use is California Department of Consumer Affairs Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation (BEARHFTI) Technical Bulletin 117 (TB 117). In order to identify the primary chemicals and/or mixtures of chemicals being used to meet TB 117 in foam for upholstered furniture, we analyzed foam collected from various furniture items including: sofas, chairs and futons, and we also examined non-furniture items such as pillows, mattress pads, baby strollers, baby car seats, and nursing pillows. Foam was collected from products purchased primarily between the years 2003-2010. The foam was extracted and analyzed using gas chromatography mass spectrometry (GC/MS) at Duke University. Analysis of indoor dust samples collected from the east coast of the U.S. revealed elevated levels of FR components similar to those found through extraction of finished goods. Preliminary studies conducted by Dr. Stapleton's laboratory to date suggest that certain FR additives found in analyzed products may be as potent a neurotoxicant as organophosphate pesticides. These data and implications will be discussed during the presentation.