

AMERICAN ENGINEERING GROUP

Trends & Developments in
Engineered Rubber Components



Presented by

Abraham Pannikottu

Operations Manager, AEG

www.engineering-group.com

Ph: 330 375 1975



ISO 9001:2000

Engineered Rubber Components: Product Platforms

- Motion Accommodation
- Fluid Transfer
- Vibration Isolation
- Power Transfer
- Damping
- Energy Absorption
- Sealing

Foundation Blocks

- Materials
- Design Technology
- Surface Science
- Process Technology

Materials

- **Natural Rubber or Natural Rubber Blends**
 - Continues to be a material of choice
 - High resistance to cyclical deformation
 - Need to ensure economic value to producers
- **Synthetic Elastomers**
 - Mostly automotive driven
 - EPDM, hydrogenated polymers to overcome fluid and temperature resistance limitations of natural rubber
 - Metallocene and hydrogenation chemistries
 - Silicones for high damping and broad temperature range capability
- **Reinforcing Fillers**
 - Carbon black and silica

Design Technology

- **Advanced use of computational tools such as FEA and dynamic analysis**
 - Unprecedented computational power enables sophisticated non-linear analysis
 - Fatigue prediction
 - Energetic analysis vs. conventional stress/strain considerations
 - Flow simulations, molding process development
- **Full systems integrated analysis**
 - Real time modeling of elastomer behavior and effects on full system
 - Account for time and temperature dependence

Surface Science

- **Adhesives**
 - Environmental friendliness
 - Improved flexibility
 - Improved fluid and heat resistance
- **Surface preparation**
 - Improved corrosion control at lower total cost
 - MetalJacket: autodeposited aqueous metal treatment/coating system
- **Coatings**
 - Enable natural rubber substrates to function in hostile environments

Process Technology

- **Complexity reduction is a key**
- **Real time control with “corrective” feedback**
- **Precision control for highly-engineered products**
 - Ability to control transfer rates for multi-layer components

- **Injection molding to dominate high volume automotive, industrial applications**
 - “In-situ” adjustments for cure cycle

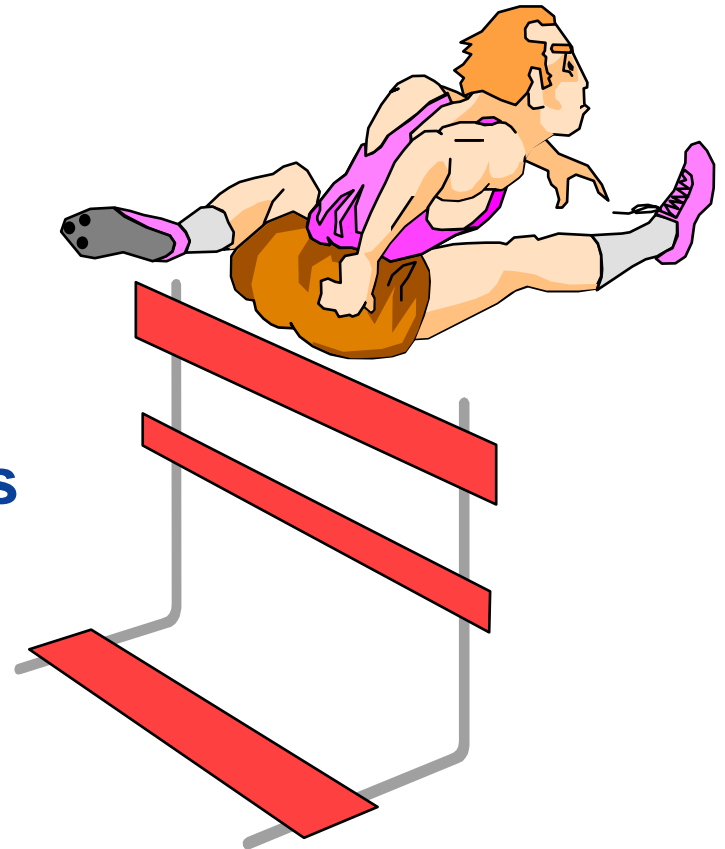
- **Mixing Technology**
 - Computer control with closed-loop feedback

Aircraft Elastomer Components



Thank you

- Product Development
- Product Manufacturing
 - FEA
- Product Design Analysis
 - Project partnership
 - Confidentiality
 - ISO 9001



“Progress through continuous innovation, technology and customer success”