

# Advances in Non-Metallic Materials

V C F Hillyard, Ensinger

Kim L Reddick, Ensinger

# A Little History

- 1930-1960's, Crystalline resins ruled
- PE, PP, POM, PA,,,,,,PI, PMMA
- 1960-82, Amorphous resin developed
- PC, PET, PEI, PES, PS, PPS
- 1983, Peek arrives.....
- 1990's, Development of filler systems
- 2000+, Hybrid, Blending & Amalgams

# "T" Series

- Blend of Thermoplastic/Thermoset
- Fabricates as a pure Thermoplastic
- Mechanical Props from -65 to 600 F
- Chemical Resistance
- Tribological properties
- Flammability and Toxicity
  - [TDS T series TU60\TDS T series TF60C.pdf](#)
  - [TDS T series TU60\TDS T series TF60V.pdf](#)
  - [TDS T series TU60\TDS T series TL60.pdf](#)
  - [TDS T series TU60\TDS T series TU60.pdf](#)
  - [TDS T series TU60\TSeriesBrochure en.pdf](#)

# Nano/Ceramic Additives

- Nano -Re-enforcement & Electrical
- Ceramic -Wear, Re-enforcement, Form
- Blending/Consistency/Stability Issues
- Nano -Armor, Electrical Shielding, ESD
- Ceramic - Bearings/Bushings, Armor

# Thermoplastic composites

- Choice of Thermoplastic Matrix
- Near net shapes, cost effective
- Lightweight structural components
- Ballistic protection
- Electronic shielding
- Acoustic / Vibration dampening

# Self Re-Inforcing Polymer (SRP)

- Non Filled Resin
- Compression St similar to Aluminum
- Ablative
- Hardness
- Chemically inert
- Fabrication by most standard methods