



iapd

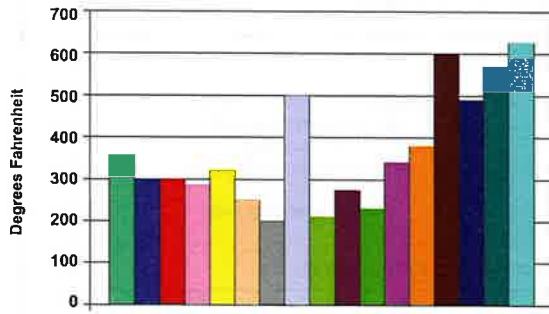
international association
of plastics distribution

IAPD THERMOPLASTICS RECTANGLE

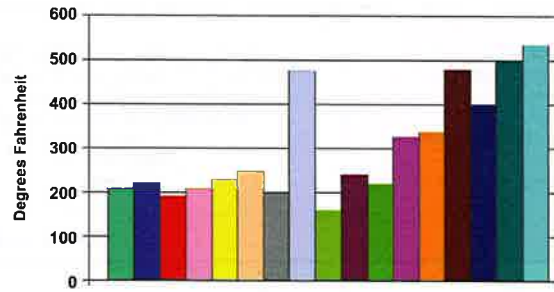
<p>High Strength High Temperature High Cost</p>	IMIDIZED	
	<p>Key Characteristics Very high cost per pound Excellent physical properties above 400 degrees F Excellent electrical properties Excellent dimensional stability Low coefficient of friction (COF)</p>	<p>Materials Polyimide (PI) Polyamide Imide (PAI) Polybenzimidazole (PBI)</p>
	AMORPHOUS HIGH PERFORMANCE THERMOPLASTICS	SEMI-CRYSTALLINE HIGH PERFORMANCE THERMOPLASTICS
	<p>Key Characteristics High cost High temperature High strength and good stiffness Good chemical resistance Transparent Hot water and steam resistance</p>	<p>Materials Polysulfone (PSU) Polyetherimide (PEI) Polyethersulfone (PES) Polyarylsulfone (PAS) Polyarylethersulfone (PAES)</p>
	<p>Key Characteristics High cost High temperature High strength Good chemical resistance Good electrical properties Low COF Good toughness</p>	<p>Materials Polyvinylidene Fluoride (PVDF) Polytetrafluoroethylene (PTFE) Ethylene-Chlorotrifluoroethylene (ECTFE) Fluorinated Ethylene Propylene (FEP) Polychlorotrifluoroethylene (PCTFE) Perfluoroalkoxy (PFA) Polyphenylene Sulfide (PPS) Polyetheretherketone (PEEK)</p>
	AMORPHOUS ENGINEERING THERMOPLASTICS	SEMI-CRYSTALLINE ENGINEERING THERMOPLASTICS
	<p>Key Characteristics Moderate cost Moderate temperature resistance Moderate strength Good to excellent impact resistance Good dimensional stability Good optical qualities Translucency</p>	<p>Materials Polycarbonate (PC) Polyphenylene Oxide (Mod PPO) Polyphenylene Ether (Mod PPE) Thermoplastic Polyurethane (TPU)</p>
	<p>Key Characteristics Moderate cost Moderate temperature resistance Moderate strength Good chemical resistance Good bearing and wear properties Low COF Difficult to bond</p>	<p>Materials Nylon (PA) Acetal (POM) Polyethylene Terephthalate (PET) Polybutylene Terephthalate (PBT) Ultra High Molecular Weight Polyethylene (UHMW-PE)</p>
AMORPHOUS COMMODITY THERMOPLASTICS	SEMI-CRYSTALLINE COMMODITY THERMOPLASTICS	
<p>Key Characteristics Low cost Low temperature resistance Low strength Good dimensional stability Transparent (typically, but not always)</p>	<p>Materials Acrylic (PMMA) Polystyrene (PS) Acrylonitrile Butadiene Styrene (ABS) Polyvinyl Chloride (PVC) Polyethylene Terephthalate Glycol (PETG) Cellulose Acetate Butyrate (CAB)</p>	
<p>Key Characteristics Low cost Low temperature resistance, strength Low COF Near zero moisture absorption Good electrical properties, toughness Difficult to bond</p>	<p>Materials High Density Polyethylene (HDPE) Low Density Polyethylene (LDPE) Polypropylene (PP) Polymethylpentene (PMP)</p>	
AMORPHOUS KEY CHARACTERISTICS	SEMI-CRYSTALLINE KEY CHARACTERISTICS	
<p>Soften over a broad range of temperatures Easy to thermoform Tend to be translucent Bond well using adhesives and solvents Prone to stress cracking Poor fatigue resistance Structural applications only (not bearing and wear)</p>	<p>Sharp melting point Difficult to thermoform Tend to be opaque Difficult to bond using adhesives and solvents Good resistance to stress cracking Good fatigue resistance Good for bearing and wear and structural applications</p>	

PLASTIC PROPERTY COMPARISON GRAPH

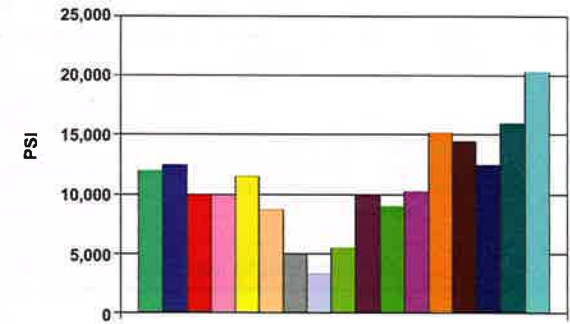
Operating Temperature Short Term



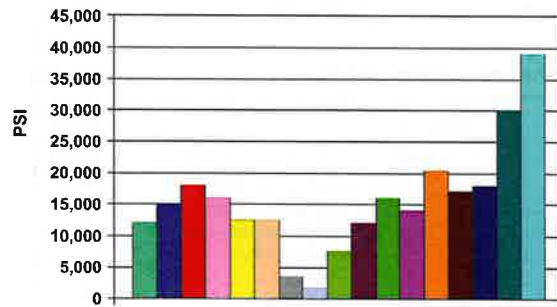
Operating Temperature Long Term (Constant)



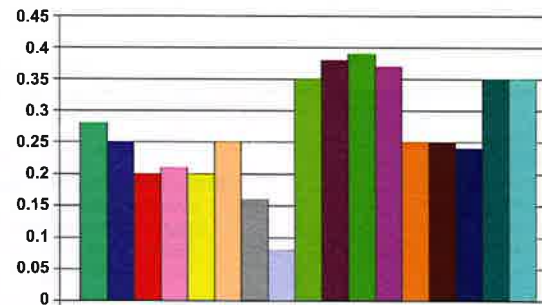
Tensile Strength



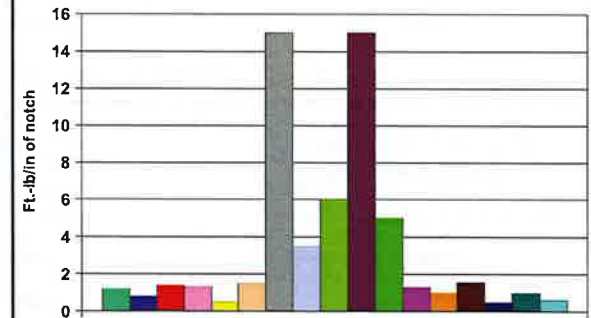
Compressive Strength



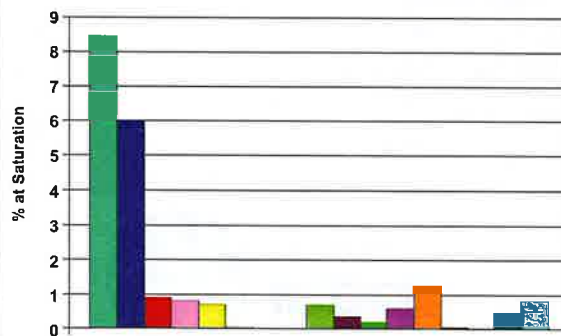
Coefficient of Friction (Lower has less friction)



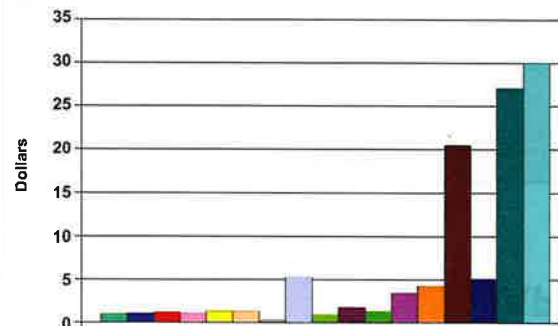
Impact Strength (The higher the impact the better)



Moisture Absorption



Cost Comparison



- Nylon 6/6
- Cast Nylon
- POM
- POM Copolymer
- Polyester PET-P
- Polyester PBT
- UHMW-PE
- PTFE
- ABS
- PC
- PPO
- PSU
- PEI
- PEEK
- PPS
- PAI
- PI

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