

High Strength  
High Temperature  
High Cost

IMIDIZED	
<p><b>Key Characteristics</b> 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><b>Materials</b> Polyimide (PI) Polyamide Imide (PAI) Polybenzimidazole (PBI)</p>
AMORPHOUS HIGH PERFORMANCE THERMOPLASTICS	SEMI-CRYSTALLINE HIGH PERFORMANCE THERMOPLASTICS
<p><b>Key Characteristics</b> High cost High temperature High strength and good stiffness Good chemical resistance Transparent Hot water and steam resistance</p>	<p><b>Materials</b> Polysulfone (PSU) Polyetherimide (PEI) Polyethersulfone (PES) Polyarylsulfone (PAS) Polyarylethersulfone (PAES)</p>
<p><b>Key Characteristics</b> High cost High temperature High strength and good stiffness Good chemical resistance Transparent Hot water and steam resistance</p>	<p><b>Materials</b> 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><b>Key Characteristics</b> Moderate cost Moderate temperature resistance Moderate strength Good to excellent impact resistance Good dimensional stability Good optical qualities Translucency</p>	<p><b>Materials</b> Polycarbonate (PC) Polyphenylene Oxide (Mod PPO) Polyphenylene Ether (Mod PPE) Thermoplastic Polyurethane (TPU)</p>
<p><b>Key Characteristics</b> Moderate cost Moderate temperature resistance Moderate strength Good to excellent impact resistance Good dimensional stability Good optical qualities Translucency</p>	<p><b>Materials</b> 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><b>Key Characteristics</b> Low cost Low temperature resistance Low strength Good dimensional stability Transparent (typically, but not always)</p>	<p><b>Materials</b> Acrylic (PMMA) Polystyrene (PS) Acrylonitrile Butadiene Styrene (ABS) Polyvinyl Chloride (PVC) Polyethylene Terephthalate Glycol (PETG) Cellulose Acetate Butyrate (CAB)</p>
<p><b>Key Characteristics</b> Low cost Low temperature resistance, strength Low COF Near zero moisture absorption Good electrical properties, toughness Difficult to bond</p>	<p><b>Materials</b> 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>