# IMIDIZED

**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)

**Materials**
- Polyamide (PA)
- Polyimide (PI)
- Polyamide Imide (PAI)
- Polybenzimidazole (PBI)

## AMORPHOUS HIGH PERFORMANCE THERMOPLASTICS

**Key Characteristics**
- High cost
- High temperature
- High strength and good stiffness
- Good chemical resistance
- Transparent
- Hot water and steam resistance

**Materials**
- Polysulphone (PSU)
- Polyoxymer (PEI)
- Polysulfone (PES)
- Polyanilin sulfone (PAS)
- Polyarylethersulfone (PAES)

## SEMI-CRYSTALLINE HIGH PERFORMANCE THERMOPLASTICS

**Key Characteristics**
- High cost
- High temperature
- High strength
- Good chemical resistance
- Good electrical properties
- Low COF
- Good toughness

**Materials**
- Polynylidyne Fluoride (PVDF)
- Polytetrafluoroethylene (PTFE)
- Ethylene-Chlorotrifluoroethylene (ECTFE)
- Fluorinated Ethylene Propylene (FEP)
- Polychlorotrifuoroethylene (PCTFE)
- Perfluoroalkoxy (PFA)
- Polyphenylene Sulfide (PPS)
- Polyetheretherketone (PEEK)

## AMORPHOUS ENGINEERING THERMOPLASTICS

**Key Characteristics**
- Moderate cost
- Moderate temperature resistance
- Moderate strength
- Good to excellent impact resistance
- Good dimensional stability
- Good optical qualities
- Translucency

**Materials**
- Polycarbonate (PC)
- Polyphenylene Oxide (Mod PPO)
- Polymylene Ether (Mod PPE)
- Thermoplastic Polyurethane (TPU)

## SEMI-CRYSTALLINE ENGINEERING THERMOPLASTICS

**Key Characteristics**
- Moderate cost
- Moderate temperature resistance
- Moderate strength
- Good chemical resistance
- Good bearing and wear properties
- Low COF
- Difficult to bond

**Materials**
- Nylon (PA)
- Acetal (POM)
- Polyethylene Terephthalate (PET)
- Polybutylene Terephthalate (PBT)
- Ultra High Molecular Weight Polyethylene (UHMW-PE)

## AMORPHOUS COMMODITY THERMOPLASTICS

**Key Characteristics**
- Low cost
- Low temperature resistance
- Low strength
- Good dimensional stability
- Transparent (typically, but not always)

**Materials**
- Acrylic (PMMA)
- Polystyrene (PS)
- Acrylonitrile Butadiene Styrene (ABS)
- Polyvinyl Chloride (PVC)
- Polyethylene Terephthalate Glycol (PETG)
- Cellulose Acetate Butyrate (CAB)

## SEMI-CRYSTALLINE COMMODITY THERMOPLASTICS

**Key Characteristics**
- Low cost
- Low temperature resistance, strength
- Near zero moisture absorption
- Good electrical properties, toughness
- Difficult to bond

**Materials**
- High Density Polyethylene (HDPE)
- Low Density Polyethylene (LDPE)
- Polypropylene (PP)
- Polymethylpentene (PMP)

## AMORPHOUS KEY CHARACTERISTICS

- 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)

## SEMI-CRYSTALLINE KEY CHARACTERISTICS

- 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

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*IAPD THERMOPLASTICS RECTANGLE*
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Phone: +913.345.1005
Fax: +913.345.1006
iapd@iapd.org
www.iapd.org