MORCO

IAPD
INTERNATIONAL ASSOCIATION OF PLASTICS DISTRIBUTORS

# IAPD THERMOPLASTICS RECTANGLE

High Strength
High Temperature
High Cost

## 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**
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**
Polysulfone (PSU)
Polyetherimide (PEI)
Polyethersulfone (PES)
Polyarylsulfone (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**
Polyvinylidene Fluoride (PVDF)
Polytetrafluoroethylene (PTFE)
Ethylene-Chlorotrifluoroethylene (ECTFE)
Fluorinated Ethylene Propylene (FEP)
Polychlorotrifluoroethylene (PCTFE)
Perfluoroalkoxy (PFA)
Polyphenylene Sulfide (PPS)
Polyetheretherketone (PEEK)

## AMORPHOUS ENGINEERING THERMOPLASTICS

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

**Materials**
Polycarbonate (PC)
Polyphenylene Oxide (Mod PPO)
Polyphenylene 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 Terepthalate (PET)
Polybutylene Terepthalate (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 Terepthalate Glycol (PETG)
Cellulose Acetate Butyrate (CAB)

## SEMI-CRYSTALLINE COMMODITY THERMOPLASTICS

**Key Characteristics**
Low cost
Low temp resistance, strength
Low COF
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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