

THERMOPLASTICS SELECTION GUIDE

Many of these plastics can be made with fillers and additives that will enhance the physical properties.



PLASTICS INTERNATIONAL™

Phone: 952-934-2303

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Higher Cost, Temperature and Strength

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IMIDIZED

MATERIALS

Polyimide (PI):
MELDIN®, VESPEL®, IMIDEX®, KAPTON®
Polyamide-imide (PAI):
TECATOR®, TORLON®

KEY CHARACTERISTICS

Very high cost per pound - Excellent physical properties above 400° F
Excellent electrical properties and dimensional stability

HIGH PERFORMANCE

MATERIALS

Polysulfone (PSU) UDEL®
Polyetherimide (PEI) ULTEM®
Polyethersulfone (PES) RADEL A®
Polyphenylsulfone (PPSU) RADEL R®

KEY CHARACTERISTICS

High cost
High temperature
High strength and good stiffness
Hot water and steam resistance

HIGH PERFORMANCE

MATERIALS

Perfluoroalkoxy (PFA)
Polychlorotrifluoroethylene (PCTFE)
Polyphenylene Sulfide (PPS) RYTON®
Fluorinated Ethylene Propylene (FEP)
Polyetheretherketone (PEEK) VICTREX®
Polytetrafluoroethylene (PTFE) TEFLON®
(PTFE with Fillers) RULON®
Ethylene-Tetrafluoroethylene (ETFE) TEFZEL®
Polyvinylidene Fluoride (PVDF) KYNAR®, SOLF®
Ethylene-Chlorotrifluoroethylene (ECTFE) HALAR®

KEY CHARACTERISTICS

High cost
High temperature
High strength
Good chemical resistance and electrical properties

ENGINEERING

MATERIALS

Polycarbonate (PC) HYZOD®, LEXAN®
Polyphenylene Oxide (Mod PPO) NORLYL®
Thermoplastic Polyurethane (TPU) ISOPLAST®

KEY CHARACTERISTICS

Moderate cost
Moderate temperature resistance
Moderate strength
Good-excellent impact resistance

ENGINEERING

MATERIALS

Polyamide (PA) NYLON®
Polybutylene Terephthalate (PBT) HYDEX 4101®
Polyoxymethylene (POM) Acetal - DELRIN®, CELCON®
Polyethylene Terephthalate (PET) TECAPET™, ERTALYTE®
High Temp-Ultra High Molecular Weight Polyethelene (UHMW-PE) TIVAR H.O.T.®

KEY CHARACTERISTICS

Moderate cost
Moderate temperature resistance
Moderate strength

COMMODITY

MATERIALS

Polystyrene (PS)
Polyvinyl Chloride (PVC)
Acrylic (PMMA) PLEXIGLAS®
Cellulose Acetate Butyrate (CAB)
Acrylonitrile Butadiene Styrene (ABS)
Polyethylene Terephthalate Glycol (PETG) VIVAK®

KEY CHARACTERISTICS

Low cost
Low temperature resistance
Low strength

COMMODITY

MATERIALS

Polypropylene (PP)
High Density Polyethylene (HDPE)
Low Density Polyethylene (LDPE)
Ultra High Molecular Weight Polyethylene (UHMW-PE) TIVAR®, LENNITE®

KEY CHARACTERISTICS

Low cost
Low temperature resistance
Low strength

AMORPHOUS PLASTICS GENERAL CHARACTERISTICS

**STRUCTURAL APPLICATIONS ONLY
(NOT SUITABLE FOR BEARING AND WEAR)**

- Soften over a broad range of temperature
- Easy to thermoform
- Tend to be translucent or transparent
- Bond well using adhesives and solvents
- Prone to stress cracking
- Poor fatigue resistance
- Poor chemical resistance

SEMI-CRYSTALLINE PLASTICS GENERAL CHARACTERISTICS

**GOOD FOR BEARING AND WEAR AS
WELL AS STRUCTURAL APPLICATIONS**

- 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 chemical resistance
- Low coefficient of friction

PROPERTY COMPARISON CHART



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