

# THERMOPLASTICS SELECTION GUIDE

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



**PLASTICS INTERNATIONAL™**

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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) NORYL®  
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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