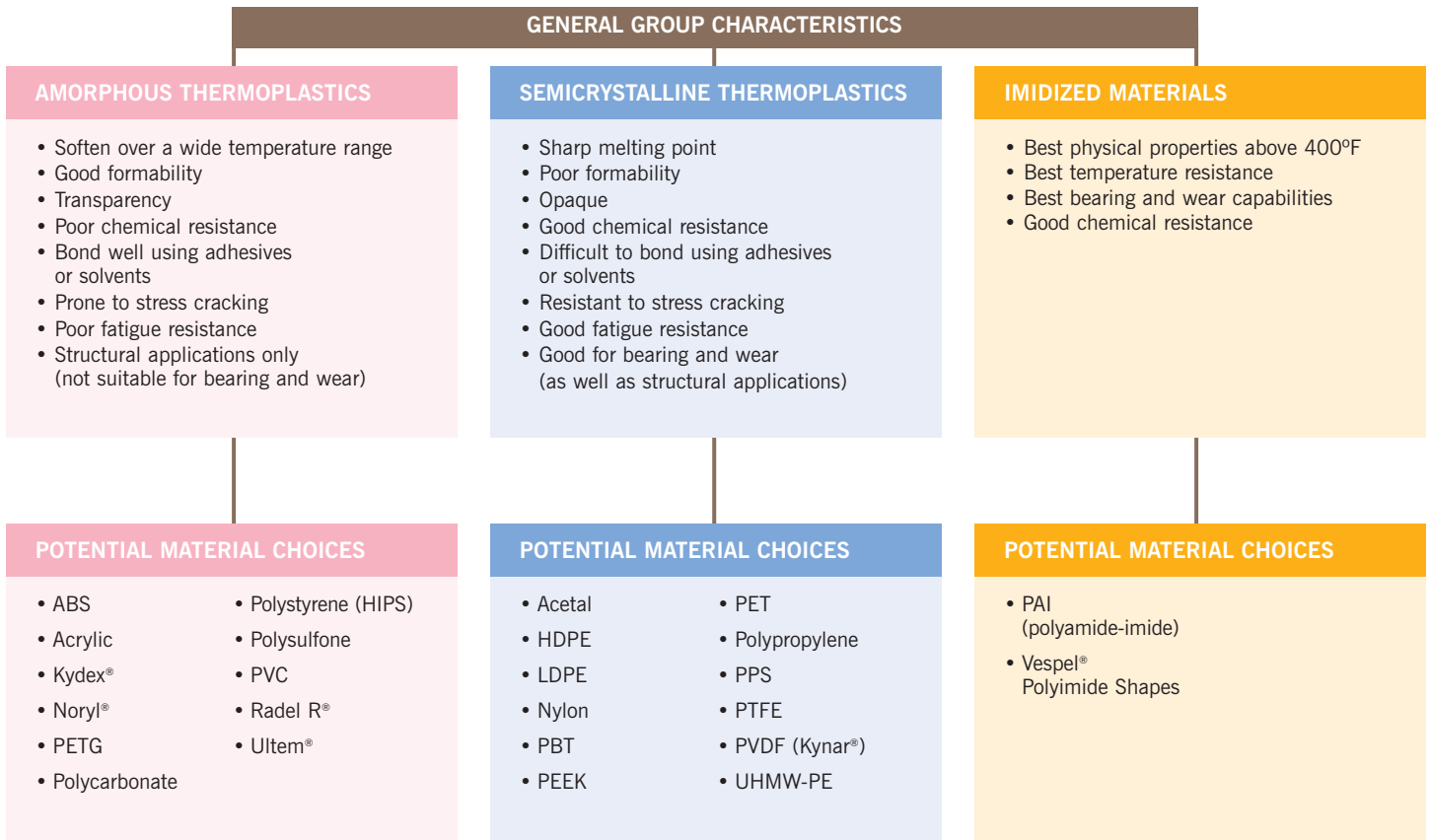


# MATERIAL SELECTION GUIDE

## 1. GET IN THE RIGHT GROUP WHAT IS MOST IMPORTANT TO THE APPLICATION?

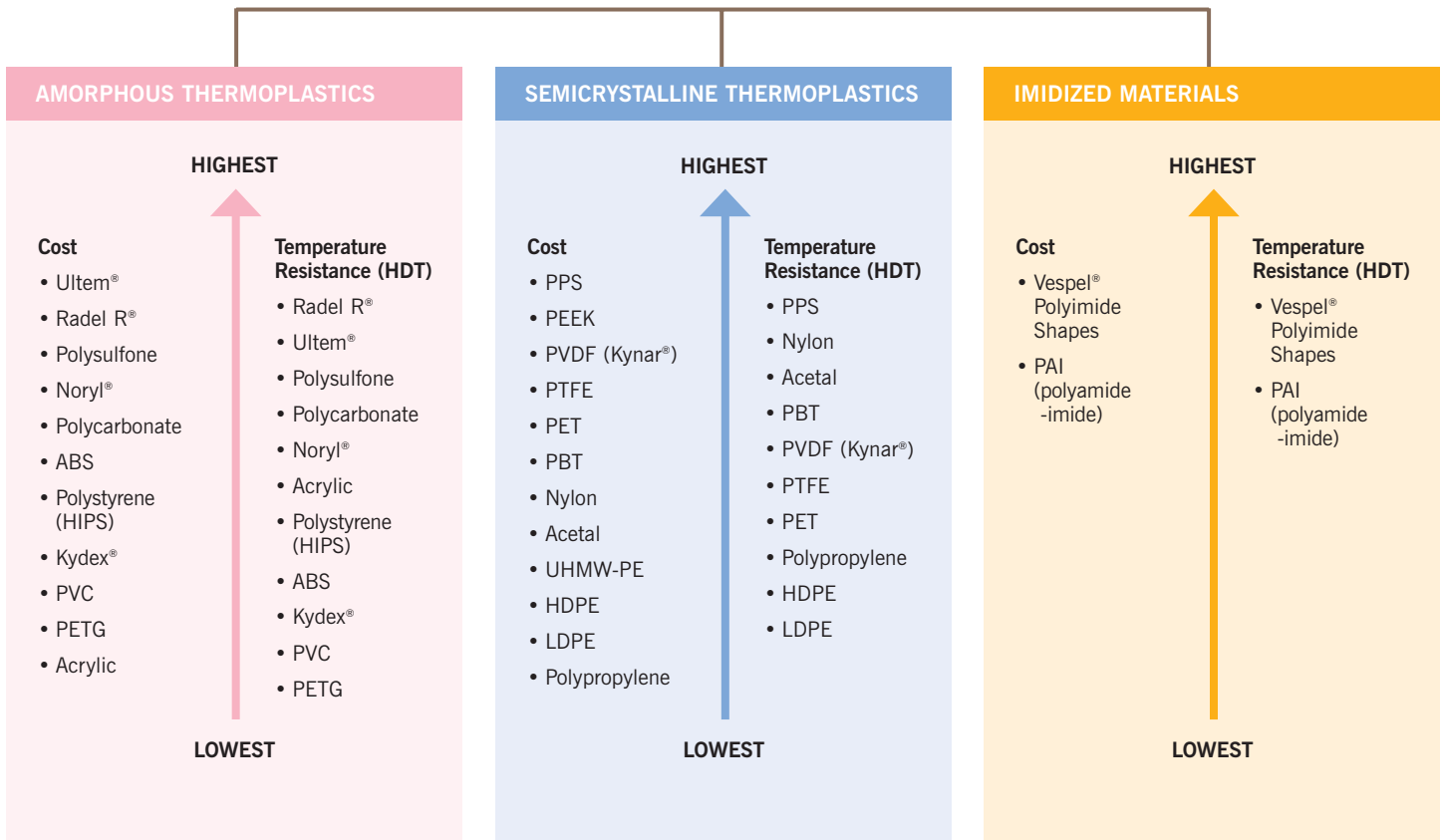


This selector guide is intended to help you review the needs of your particular application and determine a few material candidates that can then be tested.

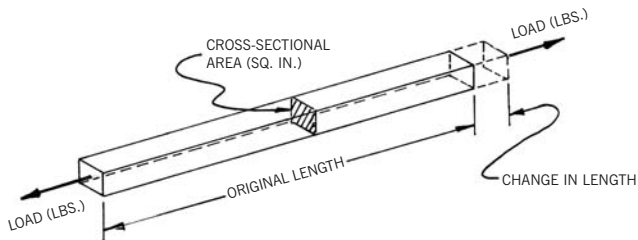
Although the information and statements herein are believed to be accurate, no guarantee of their accuracy is made. The statements and information are included for reference purposes only and are not intended and should not be construed as either a warranty of any type or representations applicable to the particular application, use or design of the buyer or user of the goods. In every case, we recommend that the purchaser or user before using or buying any product perform their own tests and make their own decision to determine to their own satisfaction whether the product is of acceptable quality, type and design and is suitable for the particular purposes under their own operating conditions.

# MATERIAL SELECTION GUIDE

## 2. CHOOSE THE BEST FAMILY IS TEMPERATURE A FACTOR? HOW CRITICAL IS COST?



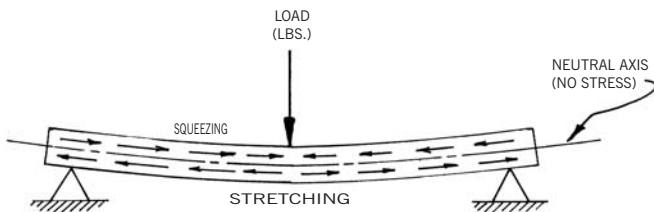
# MATERIAL SELECTION GUIDE



## 3. COMPARE THE MECHANICAL PROPERTIES IS TENSILE STRENGTH (RESISTANCE TO BEING PULLED APART) IMPORTANT?

| AMORPHOUS THERMOPLASTICS   | SEMICRYSTALLINE THERMOPLASTICS  | IMIDIZED MATERIALS   |
|--|---|--|
| <b>Tensile strength - pull apart (psi)</b> <ul style="list-style-type: none"> <li>• Ultem® 15,200</li> <li>• Polysulfone 10,200</li> <li>• Radel R® 10,100</li> <li>• Acrylic 10,000</li> <li>• Noryl® 9,600</li> <li>• Polycarbonate 9,500</li> <li>• PETG 7,700</li> <li>• PVC 7,500</li> <li>• Kydex® 6,100</li> <li>• ABS 4,100</li> <li>• Polystyrene (HIPS) 3,500</li> </ul> | <b>Tensile strength - pull apart (psi)</b> <ul style="list-style-type: none"> <li>• PEEK 14,000</li> <li>• Nylon (6 cast) 10,000-13,500</li> <li>• PPS 12,500</li> <li>• Nylon (6/6 extruded) 12,400</li> <li>• PET 11,500</li> <li>• Acetal (Homopolymer) 10,000</li> <li>• Acetal (Copolymer) 9,800</li> <li>• PBT 8,690</li> <li>• PVDF (Kynar®) 7,800</li> <li>• Polypropylene (Homopolymer) 5,400</li> <li>• HDPE 4,000</li> <li>• Polypropylene (Copolymer) 3,800</li> <li>• UHMW-PE 3,100</li> <li>• PTFE 1,500-3,000</li> <li>• LDPE 1,400</li> </ul> | <b>Tensile strength - pull apart (psi)</b> <ul style="list-style-type: none"> <li>• PAI (polyamide-imide) 21,000</li> <li>• Vespel® Polyimide SP-1 12,500</li> <li>• Vespel® Polyimide SP-21 9,500</li> <li>• Vespel® Polyimide SP-3 8,200</li> <li>• Vespel® Polyimide SP-22 7,500</li> <li>• Vespel® Polyimide SP-211 6,500</li> </ul> |

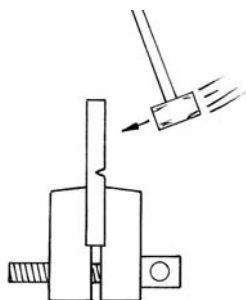
# MATERIAL SELECTION GUIDE



## 4. COMPARE THE MECHANICAL PROPERTIES IS FLEXURAL MODULUS (BENDING STIFFNESS) IMPORTANT?

| AMORPHOUS THERMOPLASTICS   | SEMICRYSTALLINE THERMOPLASTICS  | IMIDIZED MATERIALS  |
|--|---|---|
| <b>Flexural modulus - stiffness (psi)</b> <ul style="list-style-type: none"> <li>• Ultem® (30% glass-filled) 1,300,000</li> <li>• Polycarbonate (20% glass-filled) 800,000</li> <li>• PVC 481,000</li> <li>• Ultem® 480,000</li> <li>• Acrylic 480,000</li> <li>• Polysulfone 390,000</li> <li>• Noryl® 370,000</li> <li>• Radel R® 350,000</li> <li>• Polycarbonate 345,000</li> <li>• Kydex® 335,000</li> <li>• Polystyrene (HIPS) 310,000</li> <li>• PETG 310,000</li> <li>• ABS 304,000</li> </ul> | <b>Flexural modulus - stiffness (psi)</b> <ul style="list-style-type: none"> <li>• PPS 600,000</li> <li>• PEEK 590,000</li> <li>• Nylon (6 cast) 420,000-500,000</li> <li>• Acetal (Homopolymer) 420,000</li> <li>• Nylon (6/6 extruded) 410,000</li> <li>• PET 400,000</li> <li>• Acetal (Copolymer) 370,000</li> <li>• PBT 330,000</li> <li>• PVDF (Kynar®) 310,000</li> <li>• Polypropylene (Homopolymer) 225,000</li> <li>• Polypropylene (Copolymer) 215,000</li> <li>• HDPE 200,000</li> <li>• UHMW-PE 110,000</li> <li>• PTFE 72,000</li> <li>• LDPE 30,000</li> </ul> | <b>Flexural modulus - stiffness (psi)</b> <ul style="list-style-type: none"> <li>• PAI (polyamide-imide) 711,000</li> <li>• Vespel® Polyimide SP-22 700,000</li> <li>• Vespel® Polyimide SP-21 550,000</li> <li>• Vespel® Polyimide SP-3 475,000</li> <li>• Vespel® Polyimide SP-211 450,000</li> <li>• Vespel® Polyimide SP-1 450,000</li> </ul> |

# MATERIAL SELECTION GUIDE

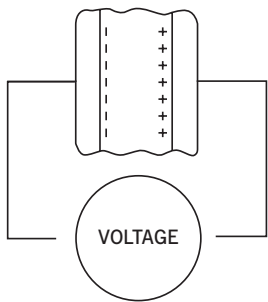


## 5. COMPARE THE MECHANICAL PROPERTIES IS IZOD IMPACT (TOUGHNESS) IMPORTANT?

| AMORPHOUS THERMOPLASTICS  | SEMICRYSTALLINE THERMOPLASTICS   | IMIDIZED MATERIALS   |
|---|--|--|
| <b>Izod impact (notched) - toughness (ft-lbs/in)</b>  | <b>Izod impact (notched) - toughness (ft-lbs/in)</b>   | <b>Izod impact (notched) - toughness (ft-lbs/in)</b>   |
| <ul style="list-style-type: none"> <li>• Kydex® 18</li> <li>• Polycarbonate 12.0-16.0</li> <li>• Radel R® 13</li> <li>• ABS 7.7</li> <li>• Noryl® 3.5</li> <li>• Polystyrene (HIPS) 2.0</li> <li>• PETG 1.7</li> <li>• Polysulfone 1.3</li> <li>• Ultem® 1.0</li> <li>• PVC 1.0</li> <li>• Acrylic 0.4</li> </ul> | <ul style="list-style-type: none"> <li>• LDPE no break</li> <li>• UHMW-PE 18.0</li> <li>• Polypropylene (Copolymer) 12.5</li> <li>• PTFE 3.5</li> <li>• PVDF (Kynar®) 3.0</li> <li>• PEEK 1.6</li> <li>• PBT 1.5</li> <li>• Acetal (Homopolymer) 1.5</li> <li>• Polypropylene (Homopolymer) 1.2</li> <li>• Nylon (6/6 extruded) 1.2</li> <li>• Acetal (Copolymer) 1.0</li> <li>• Nylon (6 cast) 0.7-0.9</li> <li>• PET 0.7</li> <li>• PPS 0.5</li> </ul> | <ul style="list-style-type: none"> <li>• PAI (polyamide-imide) 2.3</li> <li>• Vespel® Polyimide SP-21 0.8</li> <li>• Vespel® Polyimide SP-1 0.8</li> <li>• Vespel® Polyimide SP-3 0.4</li> </ul> |

CLICK, LEARN MORE »

## MATERIAL SELECTION GUIDE

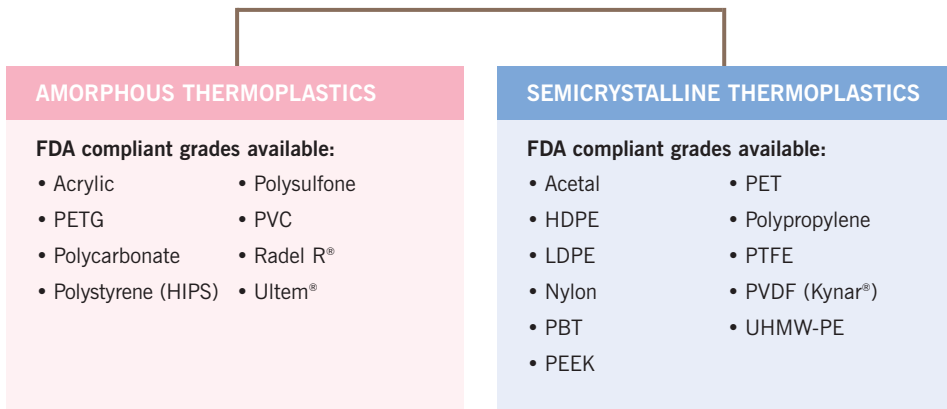


### 6. COMPARE THE PROPERTIES IS DIELECTRIC STRENGTH (ELECTRICAL INSULATION) IMPORTANT?

| AMORPHOUS THERMOPLASTICS                        | SEMICRYSTALLINE THERMOPLASTICS                  | IMIDIZED MATERIALS                              |
|---|---|---|
| <b>Dielectric strength - insulation (v/mil)</b> | <b>Dielectric strength - insulation (v/mil)</b> | <b>Dielectric strength - insulation (v/mil)</b> |
| • Ultem® 830                                    | • Nylon (6 cast) 500-600                        | • PAI (polyamide-imide) 600                     |
| • PVC 544                                       | • Acetal (Homopolymer) 500                      | • Vespel® Polyimide SP-1 560                    |
| • Kydex® 514                                    | • Acetal (Copolymer) 500                        |   |
| • Noryl® 500                                    | • PTFE 400-500                                  |   |
| • Acrylic 430                                   | • PEEK 480                                      |   |
| • Polysulfone 425                               | • PPS 450                                       |   |
| • PETG 410                                      | • PET 400                                       |   |
| • Polycarbonate 380                             | • PBT 400                                       |   |
| • Radel R® 360                                  | • Nylon (6/6 extruded) 300-400                  |   |
|   | • PVDF (Kynar®) 280                             |   |

# MATERIAL SELECTION GUIDE

## 7. THINK ABOUT THE APPLICATION - IS FDA COMPLIANCE IMPORTANT?



The virgin, natural, unfilled formulations of the sheet, rod, tube, and film products listed here are available from Curbell Plastics, Inc. in grades that comply with one or more of the FDA's guidelines for direct food contact at room temperature.

**It is important to specify FDA compliant material at the time of the order to ensure that FDA compliant material is provided.**

## 8. THINK ABOUT THE APPLICATION - IS CHEMICAL RESISTANCE IMPORTANT?

