

GENERAL GROUP CHARACTERISTICS

AMORPHOUS THERMOPLASTICS

- Soften over a wide temperature range
- Good formability
- Transparency
- Poor chemical resistance
- Bond well using adhesives or solvents
- Prone to stress cracking
- Poor fatigue resistance
- Structural applications only (not suitable for bearing & wear)

POTENTIAL MATERIAL CHOICES

- ABS
- Acrylic
- Kydex®
- Noryl®
- PETG
- Polycarbonate
- Polystyrene (HIPS)
- Polysulfone
- PVC
- Radel R®
- Ultem®

SEMICRYSTALLINE THERMOPLASTICS

- Sharp melting point
- Poor formability
- Opaque
- Good chemical resistance
- Difficult to bond using adhesives or solvents
- Resistant to stress cracking
- Good fatigue resistance
- Good for bearing & wear (as well as structural applications)

POTENTIAL MATERIAL CHOICES

- Acetal
- HDPE
- LDPE
- Nylon
- PBT
- PEEK
- PET
- Polypropylene
- PPS
- PTFE
- PVDF (Kynar®)
- UHMW-PE

IMIDIZED MATERIALS

- Best physical properties above 400°F
- Best temperature resistance
- Best bearing & wear capabilities
- Good chemical resistance

POTENTIAL MATERIAL CHOICES

- PAI (polyamide-imide)
- Vespel® Polyimide Shapes

Highest

Temp. Resistance (HDT)

Cost

- Radel R®
- Ultem®
- Polysulfone
- Polycarbonate
- Noryl®
- Acrylic
- Polystyrene (HIPS)
- ABS
- Kydex®
- PVC
- PETG
- Ultem®
- Radel R®
- Polysulfone
- Noryl®
- Polycarbonate
- ABS
- Polystyrene (HIPS)
- Kydex®
- PVC
- PETG
- Acrylic

Lowest

Highest

Temp. Resistance (HDT)

Cost

- PPS
- Nylon
- Acetal
- PBT
- PVDF (Kynar®)
- PTFE
- PET
- Polypropylene
- HDPE
- LDPE
- PPS
- PEEK
- PVDF (Kynar®)
- PTFE
- PET
- Polypropylene
- HDPE
- LDPE

Lowest

Highest

Temp. Resistance (HDT)

Cost

- Vespel® Polyimide Shapes
- PAI (polyamide-imide)
- Vespel® Polyimide Shapes
- PAI (polyamide-imide)

Lowest

GENERAL GROUP CHARACTERISTICS

AMORPHOUS THERMOPLASTICS

Tensile strength - pull apart (psi)

• Ultem®	15,200
• Polysulfone	10,200
• Radel R®	10,100
• Acrylic	10,000
• Noryl®	9,600
• Polycarbonate	9,500
• PETG	7,700
• PVC	7,500
• Kydex®	6,100
• ABS	4,100
• Polystyrene (HIPS)	3,500

SEMICRYSTALLINE THERMOPLASTICS

Tensile strength - pull apart (psi)

• PEEK	14,000
• Nylon (6 cast)	10,000-13,500
• PPS	12,500
• Nylon (6/6 extruded)	12,400
• PET	11,500
• Acetal (homopolymer)	10,000
• Acetal (copolymer)	9,800
• PBT	8,690
• PVDF (Kynar®)	7,800
• Polypropylene (homopolymer)	5,400
• HDPE	4,000
• Polypropylene (copolymer)	3,800
• UHMW-PE	3,100
• PTFE	1,500-3,000
• LDPE	1,400

IMIDIZED MATERIALS

Tensile strength - pull apart (psi)

• PAI (polyamide-imide)	21,000
• Vespel® Polyimide SP-1	12,500
• Vespel® Polyimide SP-21	9,500
• Vespel® Polyimide SP-3	8,200
• Vespel® Polyimide SP-22	7,500
• Vespel® Polyimide SP-211	6,500

Flexural modulus - stiffness (psi)

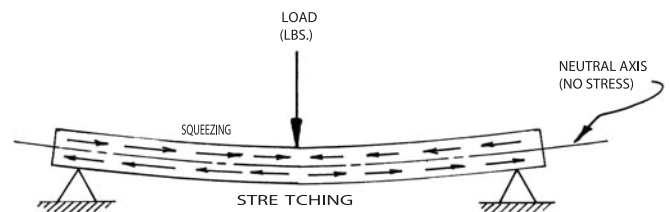
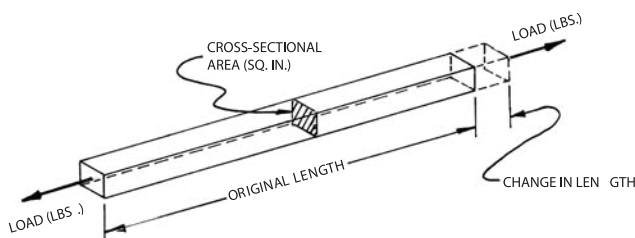
• Ultem® (30% glass-filled)	1,300,000
• Polycarbonate (20% glass-filled)	800,000
• PVC	481,000
• Ultem®	480,000
• Acrylic	480,000
• Polysulfone	390,000
• Noryl®	370,000
• Radel R®	350,000
• Polycarbonate	345,000
• Kydex®	335,000
• Polystyrene (HIPS)	310,000
• PETG	310,000
• ABS	304,000

Flexural modulus - stiffness (psi)

• PPS	600,000
• PEEK	590,000
• Nylon (6 cast)	420,000-500,000
• Acetal (homopolymer)	420,000
• Nylon (6/6 extruded)	410,000
• PET	400,000
• Acetal (copolymer)	370,000
• PBT	330,000
• PVDF (Kynar®)	310,000
• Polypropylene (homopolymer)	225,000
• Polypropylene (copolymer)	215,000
• HDPE	200,000
• UHMW-PE	110,000
• PTFE	72,000
• LDPE	30,000

Flexural modulus - stiffness (psi)

• PAI (polyamide-imide)	711,000
• Vespel® Polyimide SP-22	700,000
• Vespel® Polyimide SP-21	550,000
• Vespel® Polyimide SP-3	475,000
• Vespel® Polyimide SP-211	450,000
• Vespel® Polyimide SP-1	450,000



GENERAL GROUP CHARACTERISTICS

AMORPHOUS THERMOPLASTICS

Izod impact (notched) - toughness (ft-lbs/in)

• Kydex®	18
• Polycarbonate	12.0-16.0
• Radel R®	13
• ABS	7.7
• Noryl®	3.5
• Polystyrene (HIPS)	2.0
• PETG	1.7
• Polysulfone	1.3
• Ultem®	1.0
• PVC	1.0
• Acrylic	0.4

SEMICRYSTALLINE THERMOPLASTICS

Izod impact (notched) - toughness (ft-lbs/in)

• LDPE	no break
• UHMW-PE	18.0
• Polypropylene (copolymer)	12.5
• PTFE	3.5
• PVDF (Kynar®)	3.0
• PEEK	1.6
• PBT	1.5
• Acetal (homopolymer)	1.5
• Polypropylene (homopolymer)	1.2
• Nylon (6/6 extruded)	1.2
• Acetal (copolymer)	1.0
• Nylon (6 cast)	0.7-0.9
• PET	0.7
• PPS	0.5

IMIDIZED MATERIALS

Izod impact (notched) - toughness (ft-lbs/in)

• PAI (polyamide-imide)	2.3
• Vespel® Polyimide SP-21	0.8
• Vespel® Polyimide SP-1	0.8
• Vespel® Polyimide SP-3	0.4

Dielectric strength - insulation (v/mil)

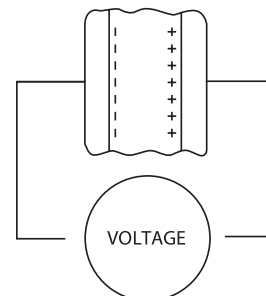
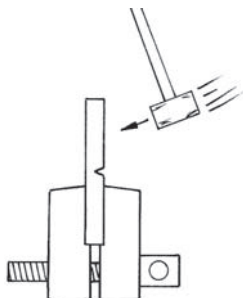
• Ultem®	830
• PVC	544
• Kydex®	514
• Noryl®	500
• Acrylic	430
• Polysulfone	425
• PETG	410
• Polycarbonate	380
• Radel R®	360

Dielectric strength - insulation (v/mil)

• Nylon (6 cast)	500-600
• Acetal (homopolymer)	500
• Acetal (copolymer)	500
• PTFE	400-500
• PEEK	480
• PPS	450
• PET	400
• PBT	400
• Nylon (6/6 extruded)	300-400
• PVDF (Kynar®)	280

Dielectric strength - insulation (v/mil)

• PAI (polyamide-imide)	600
• Vespel® Polyimide SP-1	560



GENERAL GROUP CHARACTERISTICS

AMORPHOUS THERMOPLASTICS

****FDA compliant grades available:**

- Acrylic
- PETG
- Polycarbonate
- Polystyrene (HIPS)
- Polysulfone
- PVC
- Radel R®
- Ultem®

SEMICRYSTALLINE THERMOPLASTICS

****FDA compliant grades available:**

- Acetal
- HDPE
- LDPE
- Nylon
- PBT
- PEEK
- PET
- Polypropylene
- PTFE
- PVDF (Kynar®)
- UHMW-PE

SEMICRYSTALLINE THERMOPLASTICS

Good chemical resistance:

- Acetal
- HDPE
- LDPE
- Nylon
- PBT
- PEEK
- PET
- Polypropylene
- PPS
- PTFE
- PVDF (Kynar®)
- UHMW-PE

IMIDIZED MATERIALS

Good chemical resistance:

- PAI (polyamide-imide)
- Vespel® Polyimide Shapes

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

Contact your local Regal Plastic for more information.

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