



ABS	ACETAL	ACRYLIC	Alloys
<p>Acrylonitrile Butadiene Styrene Acrylonitrile-Heat & Chem Resist Tensile Strength Butadiene-Tough, Low Temp Prop Impact resistance Styrene-Ease of Processing Stiffness, Gloss</p>	<p>Formaldehyde polymer - POM Homopolymers -superior mech properties, stiffness & tensile Copolymers -easier processing</p>	<p>Polymethylene methacrylate PMMA</p>	<p>PC/ABS PC/PET PC/PBT PC/TPU ABS/TPU ABS/Nylon</p>
<p>Advantages: High Impact w/toughness,rigidity, tensile strength,superior prop retention light weight,high gloss,good color good scratch res,electroplates well</p>	<p>Advantages: Most metal like plastic,Excellent fatigue resist,Excellent creep resist, Good moisture resistance, fast molding,Chem resistant,lubricity</p>	<p>Advantages: Exc Weather resist, process easy, Good Abrasion resis,low shrinkage Exc clarity,high gloss, good feel,</p>	<p>Advantages: Processes easy can have better chemical resistance than homopolymer good mixture of characteristics between both resins.</p>
<p>Disadvantages: Low impact at<-40deg,moderate tough in FR grades,low cont.use temp 150°F Poor UV Stability,Must be dried,</p>	<p>Disadvantages: Notch sensitive,high shrink,Flammable poor UV,Formaldehyde Odor, Poor acid resist, Hard to decorate</p>	<p>Disadvantages: Stress crack prone, Poor creep res. Low impact, poor solvent resis, limited high temp 200F.</p>	<p>Disadvantages: no clarity, cost</p>
<p>Applications: Appliance Housings,toolboxes,radios, telephones,power tools,luggage,pipe, Interior auto parts,lawn and garden</p>	<p>Applications: Gears,bushings,rollers,chains, Bic lighters,ski bindings,zips, plumbing,carburator parts,</p>	<p>Applications: Airplane windows,signs,TicTac box skylights,hockey boards,fish tanks contacts,tail lights,</p>	<p>Applications: automotive interior, packaging Toys, household items</p>
<p>Cross Reference: Impact,Tensile Strength, Melt Flow</p>	<p>Cross Reference: Flow Rate,Tensile Strength, Viscosity, Impact,</p>	<p>Cross Reference: Imp or Non impact, melt flow</p>	<p>Cross Reference: high heat or cold weather chemical resistance</p>
<p>Processing: Specific Gravity 1.05g/cc Melt Temp 425-500 deg F Mold Temp 80 - 150 deg F Shrinkage .002-.008 Amorphous material Pre Dry 2 hrs. 180-190F</p>	<p>Processing: Specific Gravity 1.42g/cc Melt Temp 390-420 deg F Mold Temp 180 deg F and up Shrinkage .018 - .022 Nonhygroscopic mtrl. no drying needed Crystalline material</p>	<p>Processing: Specific Gravity 1.18 g/cc Melt Temp 375-475 deg F Mold Temp 120-200 deg F Shrinkage .002-.008 Drying 2-3 hours Hygroscopic material, Amorphous</p>	<p>Processing: melt temp 480 F - 550 F mold temp 65 F - 180 F drying required</p>

ASA / AES	Butadiene Styrene	EVA	MPR	NYLON
Acrylic Styrene Acrylonitrile Weatherable Polymer	Styrene Butadiene Copolymer SBS	Ethylene Vinyl Acetate Blend of LDPE & EVA 700 & 600 2Xmore flex than LDPE 500 & 400 3Xmore flex than LDPE 200 & 300 7Xmore flex than LDPE	Melt Processable Rubber Most rubbery grade of thermoplastic,	Polyamide Crystalline Two basic Types: 6 & 66 America uses 90% 66 Refers to the arrangement of acid and amine in chains Type, 10,11,12,6/10,6/12,4/6
Advantages: High Impact at low temp,high gloss, good strength on prolonged exposure to sunlight, chem & heat resistance, soft flow, great weatherability,gloss	Advantages: FDA approved and USP IV rated for medical applications,Tough durable,shatter resist,high gloss Good surface finish	Advantages: Copolymer with good clarity, flexibility,impact strength UV resis, Tensile strength, Tough, crack resistance,	Advantages: Outstanding weather and ozone resistance,Exc Oil and heat resistance, Exc wear abrasion	Advantages: Exc. solvent and chemical resistance, self lubricating 6 = more flex,more trans,lower heat deflection,less moist abs.
Disadvantages: Tensile Strength, Compatibility with PVC is only adequate. blending is difficult	Disadvantages: Notch Sensitivity, Chemical Resistance compared to other engineering materials,	Disadvantages: Limited Thermal Stability, Lower Melt Viscosity	Disadvantages:	Disadvantages: Hygroscopic - sucks in water 66 = stiffer, higher heat deflect Must be Dried,
Applications: Marine Buoys,Pool filters,Mail boxes Radio Housings,stack chair Truck bed covers,Pedal boats,	Applications: Food packaging, Toys, Housewares,	Applications: Gaskets,disposable syringes, toys,seals,medical hoses, Wire & Cable Insulation	Applications: Weather-stripping, Gas Nozzle splash guard Crutch tips, Wiper blades	Applications: Auto, elect connectors, bushings,bearings,astroturf,
Cross Reference:	Cross Reference: mold shrinkage, melt flow,	Cross Reference: Melt flow, Eva %, HDPE or LDPE	Cross Reference:	Cross Reference: Type 6 or 66, Tensile, Flex
Processing: Specific Gravity 1.05g/cc Melt Temp 500 deg F Mold Temp 106 deg F Shrinkage .004 - .007 Hygroscopic dried for 4-6hrs. 185F Amorphous material	Processing: No Drying needed Amorphous Material	Processing: Inject -2-10% EVA 350-430F Ext. -15-30% EVA 300-380F EVA will degrade above 450F Amorphous material	Processing: Melt Temp. 320-350F	Processing: Spec. Grav unfilled 1.13-1.19 Melt Temp 490-600 deg F Mold Temp 150-220 deg F Shrink unfilled .016-.025 Shrink filled .002-.010 "/" Semicrystalline, Hygroscopic

PBT and PET	PC	PE	PCT and PSU
<p>Polybutylene Terephthalate Polyethylene Terephthalate</p>	<p>Polycarbonate Amorphous Drying is a must 3-4 hrs at 250deg F Melt Flows = 4-6 for Inj, blow,Ext 6-22 Injection The thicker the part = weaker part the higher the flow =weaker part</p>	<p>Polyethylene / Crystalline LDPE - flexible,heat stable poor abrasion resist, HDPE - Stiff,Chem Resist good abrasion resist, LLDPE - Exc heat stability, Exc. abrasion resist</p>	<p>Polycyclohexylenedimethylene Terephthalate Polysulfone</p>
<p>Advantages: White Opaque, tough,strong rigid, Exc chem resist, elect prop,good lube</p>	<p>Advantages: Tough,Heat resist,clarity,Exc UV Prop. Electrical Prop,Weatherability, Transparent, Low water absorption, good dimensional stability,</p>	<p>Advantages: Low Cost,Exc insulating,Moist resist, Milky or transparent, Food grades avail, Excellent insulator, good chem resist, Impact resist -40 to 90C</p>	<p>Advantages: can take higher heat, can be used for some medical and FDA uses.</p>
<p>Disadvantages: High shrike - prone to warp, low impact,poor water resist, Poor UV,hard to process</p>	<p>Disadvantages: Notch Sensitivity, Chem Resist, Abrasion Resist, Weatherability, High process temps,</p>	<p>Disadvantages: Poor weathering, subject to stress cracking, flammable, difficult in bonding</p>	<p>Disadvantages cost, hot mold (oil mold heaters) higher processing temps</p>
<p>Applications: Elect components, gears Auto parts,medical equip, Oven Handles, Chair Arms</p>	<p>Applications: auto lenses, CD's,Eyeglasses, Cellular phones, blood processing equip, camera housings, compact disks</p>	<p>Applications: milk & juice bottles, pales, crates bags margarine tubs,shampoo bottles, film, food packaging</p>	<p>Applications: PSU - medical, FDA, clear, higher heat PCT - FDA</p>
<p>Cross Reference: Filled of unfilled, FR approve, minimum thickness,tensile</p>	<p>Cross Reference: Melt Flow Rate, special packages, UV - Mold release - tints</p>	<p>Cross Reference: Density, MFR,Additives</p>	<p>Cross Reference:</p>
<p>Processing: Melt Temp 520-570PET 470-510F Mold Temp 190-230PET 90-150F Shrinkage .001-.015 Density 1.2 - 1.7 g/cc Drying 225 - 275 F 2-16 hours Semi-Crystalline,</p>	<p>Processing: Specific gravity - unfilled 1.20 Specific gravity - filled 1.25-1.33 Melt Temp 500-600 deg F Mold Temp 100-175 deg F Shrinkage unf .004-.007 fill .002-.005 Hygroscopic - needs drying</p>	<p>Processing: Mold Temp - lowest possible Inject speed -fastest possible Melt Temp - Highest allowable Semi-crystalline</p>	<p>Processing: Mold Temp 300F - 350F Melt Temp 550F - 600F</p>

PP	PPS	PS	PVC
<p>Polypropylene/Crystalline Homopolymer Copolymer - 1.) Random Copolymer clarity, lack of blush 2.) Impact Copolymer Mod with elas or rubr.</p>	<p>Polyphenylene Sulfide <i>Metal Like material</i></p>	<p>Polystyrene Amorphous Water White Resin Impact Ranges(Notched Izod) Crystal , 1.0 MIPS 1.0 to 1.5 HIPS >1.5</p>	<p>Polyvinyl Chloride Amorphous Rigid & Flexible Flex - 1.)Durometer Rigid- 1.)Flow</p>
<p>Advantages: High Elongation,Low density,Low cost Exc moist resist,Easy color,good imp. Exc chem resist,Exc flex,Food grades Exc elec insulator, clarity</p>	<p>Advantages: Rigid plastic,Flame Retardant Chemical Resist,Thermal Stable Stiffness, Good Retent of Mech. strength at high temp.</p>	<p>Advantages: Optical clarity,high gloss,FDA Grades low cost,good rigidity,easily decorated Exc elect prop,Dimens stability</p>	<p>Advantages: Exc Impact, Dimens stable, low cost Good abrasion resist, Wide color range good chem resist, Weather resist, Always V0 or better</p>
<p>Disadvantages: Low Rigidity,Poor UV stability, Poor creep resis,Moderate gloss, Poor heat resis, high shrink,</p>	<p>Disadvantages: Cost, Melt Strength, Colorability filler required for good strength, attacked by chlorinated solvents</p>	<p>Disadvantages: Poor weatherability,Poor thermal prop Poor solvent resistance, Cracking Brittle,</p>	<p>Disadvantages: Shear & Heat sensitive, Solvents attack, High Density,HCL Acid, Thermal capable</p>
<p>Applications: Flex hinges,ketchup bottles, video tape cases,auto comp, yogurt cups,</p>	<p>Applications: Elec components,Pump parts Chem processing Equip, Automotive under hood</p>	<p>Applications: Refrig liners,food cont, medical,plastic silverware TV Housings,toys</p>	<p>Applications: Medical masks,auto, Computer housings appliances,plumbing, bottles, Cable jackets,</p>
<p>Cross Reference: Homo or Co,Melt Flow, Impact</p>	<p>Cross Reference: Heat Characteristics % glass content</p>	<p>Cross Reference: Impact or Crystal, Melt Flow, Impact</p>	<p>Cross Reference: Rigid or flex,clear or opaque, impact</p>
<p>Processing: Specific gravity unfill .90-.91 Melt Temp 375-525 deg F Mold Temp 40-120 deg F</p>	<p>Processing: Melt Temp - 470 - 500 deg F Mold Temp =300F to get crystallinity <300F material will be more amorphous Drying 2-4hrs. at 300F Semicrystalline, Nonhygroscopic</p>	<p>Processing: Melt Temp 450-525 deg F Mold Temp 80-140 deg F Shrinkage .004-.007 Drying 2-3 hours at 150-180 Inject = fast Amorphous</p>	<p>Processing: Density 1.30-1.50 g/cc Melt Temp 350-410 deg F Mold Temp 60-150 deg F Shrinkage .002-.008</p>

SAN	TPE/TPEE/Elastomers	TPO	TPU
<p>Copolymer of Styrene & Acrylonitrile -</p> <p>Acrylonitrile adds chemical resistance to Styrene</p> <p>Amorphous Material</p>	<p>Thermoplastic Elastomer</p> <p>Thermoplastic Etherester Elastomer</p> <p>Many different resin carriers from PE, PP, PS, Polyester...</p>	<p>Thermoplastic Olefins</p>	<p>Polyurethane Elastomer</p> <p>Amorphous</p> <p>Elastomer Translucent with a light brown haze</p> <p>Ester - toughness, oil resis, chem resis</p> <p>Ether-low temp, hydrolic stable,</p> <p>- resist microorganism, hot & wet env</p>
<p>Advantages:</p> <p>Rigid,hard,good tensile,high gloss</p> <p>low cost,dishwasher safe, good clarity, good chem resist,</p>	<p>Advantages:</p> <p>Replaces rubber, tear resist, FDA,colorable,good fatigue resist,flex at low temp,Medical Grades</p> <p>Can have clarity on oelfin grades.</p>	<p>Advantages:</p> <p>High Temp rigidity,flexibility, heat aging,Weatherability, sound dampening, heat & solvent resistance</p>	<p>Advantages:</p> <p>Good flexibility and abrasion resistant, tougher than rubber,</p>
<p>Disadvantages:</p> <p>Low impact,poor elongation,brittle, yellow cast,long heat causes yellow, water absorption,low thermal capacity,</p>	<p>Disadvantages:</p> <p>Cost, softer durometers are harder to process and eject from the mold</p>	<p>Disadvantages:</p> <p>cost,</p>	<p>Disadvantages:</p> <p>Poor chemical resistance, depending on type of chemical family</p>
<p>Applications:</p> <p>Tumblers,cups,mugs,bowls, cosmetic cases,blender & mixer bowls, Faucet Handles, Refrig crisper,</p>	<p>Applications:</p> <p>Ski Bindings, Watchbands</p> <p>CV boot,Screw driver handles, Bottles, medical hose, shoe soles,</p>	<p>Applications:</p> <p>Wire & Cable,Golf cart parts,Lawn mower parts, Mud flaps,Truck grill</p>	<p>Applications:</p> <p>Auto Bumpers,Elastic thread</p> <p>Cable covering,Shock absorb</p> <p>Padding for sports equip</p>
<p>Cross Reference:</p> <p>Melt flow, impact, tint</p>	<p>Cross Reference:</p> <p>Flex Mod, Duro, melt, resin carrier</p> <p>Density, clarity, food & medical regs</p>	<p>Cross Reference:</p> <p>Temp. range, VO, Melt flow char. flex mod</p>	<p>Cross Reference:</p> <p>Durometer, Ether or Ester based</p>
<p>Processing:</p> <p>Density 1.08 g/cc, Inject Speed fast</p> <p>Melt Temp 375-500 deg F</p> <p>Mold Temp 90-140 deg F</p> <p>Shrinkage .003-.007</p> <p>Drying 2-4 hrs at 170deg F</p> <p>Amorphous, Re grind 20%</p>	<p>Processing:</p> <p>Drying 3 hrs at 180 deg F</p> <p>Mold Temp 80 - 105 deg F</p> <p>Melt Temp 390-430 deg F</p> <p>Purge with Polypropylene</p> <p>Engage: Affinity:</p> <p>Dens - .864-.880 .920</p>	<p>Processing:</p> <p>Semi-Crystalline</p>	<p>Processing:</p> <p>Mold Temp 60 -140F</p> <p>Melt Temp 340-440F</p> <p>20% Re grind Acceptable</p> <p>Dry 1-2 hrs. 175-200F</p> <p>Must Be dried</p>