APPLIED TECHNOLOGIES, INC.

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Considerations when Selecting a Plastic Material of an End-Use Application

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Permanence	Weatherability	Sunlight (embrittlement) Moisture (swelling, degradation)
	Impact Resistance	Low Temperature (often)
	Structural	Strength (e.g.: bosses, latches, shelving, pressure vessel) Stiffness (e.g.: tray, patio chair, pump housing
	Flexibility, Elastic Memory	Latches, clips, springs, bumpers
	Dimensional Stability	Short Term (Post molding predictability) Intermediate Term (moisture swelling) Long Term: Creep (shelf) and stress relaxation (bottle cap)
	Elevated Temp. Resistance	Short Term: softening, melting Long Term: Thermal Degradation (embrittlement0 Long Term: Dimensional Change
	Transparency	Abrasion resistance (auto lens) Colorability Refractive index (lenses)
	Wear Resistance	Lubricity
	Chemical Resistance	ESCR (environmental stress crack resistance) Hydrolysis resistance Biologicals (blood, perspiration) Lubricants, WD 40
	Sterilization	Steam Autoclave Gamma E-Beam
Aesthetics	Appearance	Gloss, Texture Color Transparency (Apple computer housing) Scratch resistance
	Tactile	Hardness (Softness) Slickness (Grip)

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Health & Safety	Extractables	Monomer (vinyl chloride, styrene, Bisphenol A) Plasticizers (DEHP [Di-(2-EthylHexyl)Phthalate)
	Fracture	Sharp or small pieces
	Flammability	Inherent Halogen / non-Halogen (alumina trihydrate (ATH), phosphorus
Electrical	Surface Resistivity	
	Volume Resistivity	
	Arc Tracking	
Regulatory	UL, FDA, CSA, CE, FCC	Approval / Existing Recognition
Specialty	Thermal	Conductivity / Resistance
	Electrical	Conductivity / Resistance
Processing	Heat softening	Injection & Rotational (easy flow) Extrusion, Thermoforming, & Blow Molding Tool Considerations: Halogens, Reinforcements
	Heat curing	Injection, Compression, Transfer Molding
Secondary Operations	Bonding	Solvent Ultrasonic, Vibration, Hot Plate
	Decorating	Painting, Plating Pad Printing Silk Screening Hot Stamp In-mold
Part Cost	Plastic Material	$/lb x SG x 0.0361= $/cu in x cu in/part = $/part (e.g. Struct. Foam)
	Tooling Construction	Aluminum, Steel, Epoxy
	Cycle Time Cost	hrs per part x $/hr for the selected process equipment
	Trimming & Fixturing	Flash, Warp