



## Understanding Different Types of Plastic Used in Manufacturing

Prepared by EPower Corp

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*EPower Corp is a leading contract manufacturer in China for plastic, metal and fully assembled products. We provide OEM & ODM services for our clients to improve their overall competitive advantage by improving their prices, quality, lead time and design. We work with a wide range of clients from startups to medium sized companies to efficiently and economically develop and build their products.*

*We own and operate several manufacturing facilities in Shenzhen and Dongguan that focus on metal fabrication, plastic injection molding and full assembly with a total floor space of close to 65,000 square feet. Being American owned and managed with local team members in China gives us a positive mindset that puts an emphasis on trust, reliability and accountability.*

## Different Types of Plastics

### *Understanding the Basics of Contract Manufacturing*

Plastic injection molding is the most popular method to manufacture parts. With thousands of types of injection molding plastic materials to choose, each coming with its very own composition and characteristics, it can be daunting for entrepreneurs, product designers, and the like to select the right plastic material to manufacture their product.

If this isn't intimidating enough, also consider most plastics can be altered to enhance their strengths as well as their impact and heat resistance. This means a new set of trade-offs in cost, strength, flexibility and surface finish. With thousands of potential combinations to choose from and so much on the line it is highly suggested to consult with an experienced injection molder to conclude the best material for your project.

Choosing the right material allows you to change the form, fit, and function of your parts. To help give you a general idea of where to start, we have developed a list below that outlines some of the advantages and applications of some of the most commonly molded materials in the plastics industry:

Material	Acronym	Mfg Process	Attributes	Application	Recyclable
Polyoxymethylene	POM	Injection Molding CNC Machining	Strong Rigid Fatigue Resistant Chemical Resistant Moisture Resistant Opaque/White Low/Medium Cost	Bearings, gears, handles, plumbing, Buttons & knobs, automotive applications and household appliances	Very Easy
Poly(methyl methacrylate)	PMMA	Injection Molding CNC Machining	Rigid Scratch Resistant Transparent Low/Medium Cost	Display stands, knobs, lenses, light housings, panels, reflectors, signs, shelves, trays	Varies
Acrylonitrile Butadiene Styrene	ABS	Injection Molding CNC Machining 3D Printing	Strong, Flexible Low Mold Shrinkage (Tight Tolerances) Chemical Resistant Electroplating Capable Opaque Low/Medium Cost	Drain pipe, automotive parts, electronic communication, common kitchen, LEGO bricks, and many other products.	Very Easy

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Material	Acronym	Mfg Process	Attributes	Application	Recyclable
Polyamide (Nylon)	PA	Injection Molding  CNC Machining  3D Printing	High Strength, Fatigue Resistant Chemical Resistant Low Creep Low Friction, Almost Opaque/White Medium/High Cost	Bearings, bushings, gears, rollers, wheels, zip ties, handles, levers, eye glass, air filters, frames, safety masks	Difficult
Polycarbonate	PC	Injection Molding  CNC Machining  3D Printing	Tough Impact Resistant Temperature Resistant Dimensional Stability Transparent, High Cost	Automotive (panels, lenses, consoles), bottles, containers, cell phone housings, reflector, safety helmets, shields, bulletproof glass.	Varies
Polyethylene Terephthalate	PBT, PET	Injection Molding  CNC Machining  3D Printing	Rigid, Heat Resistant, Chemical Resistant, Medium/High Cost	Automotive (filters, handles, pumps), bearings, cams, electrical components (connectors, sensors), gears, housings, rollers, switches, valves	Very Easy
Poly Ether Ketone	PEEK	Injection Molding  CNC Machining  3D Printing	Strong Thermal Stability Chemical Resistant Abrasion Resistant Low Moisture Absorption	Aircraft components, electrical connectors, piston parts and pumps; cable insulation; compatible with ultra-high vacuum	Difficult

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Material	Acronym	Mfg Process	Attributes	Application	Recyclable
				applications	
Polyetherimide	PEI	Injection Molding CNC Machining	Heat Resistant, Flame Resistant Transparent (Amber Color)	Medical, chemical instrumentation; HVAC and fluid handling; electrical and lighting	Y?
Polyethylene - Low Density	LDPE	Injection Molding CNC Machining	Lightweight Tough and Flexible, Chemical Resistant Natural Waxy Appearance, Low Cost	Kitchenware, housings, covers, and containers	Varies
Polyethylene - High Density	HDPE	Injection Molding CNC Machining	Tough and Stiff, Chemical Resistant, Natural Waxy Appearance, Low Cost	Chair seats, housings, covers, and containers,	Easy
Polyphenylene Oxide	PPO	Injection Molding	Tough Heat Resistant Flame Resistant Dimensional Stability, Low Water Absorption Electroplating Capable High Cost	Automotive (housings, panels), electrical components, housings, plumbing components	Varies
Polyphenylene Sulphide	PPS	Injection Molding CNC Machining	High Strength Heat Resistant Brown High Cost	Medical instrument components, sterilization trays, automotive fuses, interior aircraft parts, hot water	Varies

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Material	Acronym	Mfg Process	Attributes	Application	Recyclable
				fittings, sockets and connectors	
Polypropylene	PP	Injection Molding CNC Machining 3D Printing	Lightweight, Heat Resistant Chemical Resistant Scratch Resistant Natural Waxy Appearance Tough and Stiff Low Cost	Automotive (bumpers, covers, trim), bottles, caps, crates, handles, housings, medical pipette tubing	Easy
Polystyrene - General purpose	GPPS	Injection Molding CNC Machining 3D Printing	Brittle, Transparent Low Cost	Cosmetics packaging, pens	Easy
Polystyrene - High impact	HIPS	Injection Molding CNC Machining 3D Printing	Impact Strength Rigid and Tough Dimensional Stability Naturally Translucent, Low Cost	Electronic housings, food containers, toys	Easy
Polyvinyl Chloride	PVC	Injection Molding CNC Machining	Tough Flexible Flame Resistant Transparent and Opaque Low Cost	Electrical insulation, housewares, medical tubing, shoe soles, toys	Difficult
Styrene Acrylonitrile	SAN	Injection Molding	Stiff Brittle Chemical Resistant Heat Resistant Transparent, Low Cost	Electrical/Electronic Applications, Household Goods, Cosmetic Packaging, Automotive Applications, cups,	Varies

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Material	Acronym	Mfg Process	Attributes	Application	Recyclable
Thermoplastic Elastomer/Rubber	TPE/R	Injection Molding 3D Printing	Tough and Flexible High Cost	Bushings, electrical components, seals, washers	Easy

## Conclusion

Selecting the right material for a product is one of the most critical factors in creating your ideal plastic part(s). Most plastics can be modified with multiple resins to obtain special engineering characteristics based on the demands of your product and the manufacturing process behind them. This is why it is necessary to work with a partner with injection molding experience.

For more information about plastics and manufacturing your product, follow us at <https://www.epowercorp.com> as we will cover plastics in greater detail in our upcoming blogs.