

Selecting Plastic Materials for **INJECTION MOLDING**

Material selection plays a huge role in injection molding for your product invention or prototype, affecting nearly every aspect of your part:

PART QUALITY

- Strength and durability
- Variable flexibility
- Custom appearance

FUNCTIONALITY

- Temperature resistance
- Transparency/opacity
- Industry suitability and safety

INJECTION MOLDING APPLICATIONS

Injection molding can be used for many applications. It is widely used for end product applications as well. These include:

- Decorative items
- Housewares
- Containers
- Automotive components
- Aerospace components
- Toys
- Simple tools
- Packaging components

COMMON MATERIALS FOR INJECTION MOLDING

Plastics are among the most versatile materials used in injection molding. Here are key strengths, weaknesses and some typical uses of several types of plastic:



PET or PETE

(POLYETHYLENE TEREPHTHALATE)

Strengths:

Glass-like clarity; variable flexibility, moisture and solvent-resistant, recyclable

Weaknesses:

Not ideal in extreme temperatures

Uses:

Food and beverage packaging, drink bottles, plastic jars, one of best general-use materials

ABS

(ACRYLONITRILE BUTADIENE STYRENE)

Strengths:

Rigid, strong

Weaknesses:

Melts at higher temperatures; will oxidize/change color in prolonged direct sunlight

Uses:

Toys, housewares, decorative items, medical devices, automotive, protective cases, electronic components



PLA

(POLYLACTIC ACID)

Strengths:

Rigid, resistant to sunlight

Weaknesses:

Medium strength

Uses:

Storage containers, food packaging, bags, utensils

PVC

(POLYVINYL CHLORIDE)

Strengths:

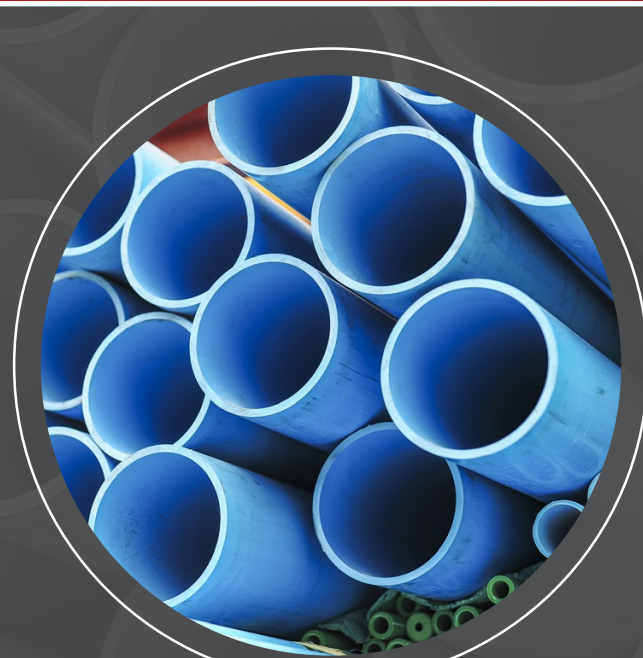
Transparent; can withstand high temperatures; resistant to chemicals, water, oxygen, sunlight

Weaknesses:

Rigid and inflexible

Uses:

Spray bottles, piping/tubing



PP

(POLYPROPYLENE)

Strengths:

Very flexible, strong, lightweight, can withstand high temperatures, water and oxygen resistant

Weaknesses:

Brittle in low temperatures

Uses:

Food containers, rigid storage containers, bottle caps

PS

(POLYSTYRENE)

Strengths: Rigid, strong, can withstand somewhat higher temperatures

Weaknesses:

Best suited for dry goods; typically just a support material in injection molding, easy dissolvability

Uses:

Straws, food containers, pharmaceutical bottles, trays, plastic utensils



HDPE

(HIGH-DENSITY POLYETHYLENE)

Strengths:

Translucent, very strong, suitable for use at high temperatures

Weaknesses:

Low flexibility, not for products containing solvents; not ideal for injection molding but can be mixed with ABS

Uses:

Bottling of distilled water, vinegar, antifreeze, bleach, lotions and water-based chemicals

NYLON

(POLYAMIDE)

Strengths:

Flexible; strong; resistant to high temperatures, sunlight, most chemicals

Weaknesses:

Absorbs moisture, subject to oxidation

Uses:

Machinery components, textiles, food packaging, household items, industrial-grade applications

