

A Guide to Optimal Material Selection in Manufacturing

Projects often start with the same question, although be it a simple one, if answered incorrectly can cause a multitude of ripples and problems down the line during the manufacture. After a concept is formed, its 'What material should we use?'

In the complex landscape of plastic manufacturing, the selection of the right material stands as a critical decision that impacts the success of any project. Each type of plastic carries a unique set of properties, ranging from strength and flexibility to chemical resistance and optical clarity. Not only as a customer, but as a manufacturer, the importance of informed decision making cannot be overstated when it comes to choosing what to use.

So...

What material and why?

The 4 most common materials we use are as follows, with a very quick summary of pros and cons to each;

Cast Acrylic: Provides optical clarity with a strength 20 times greater than glass. It is easily formed, manipulated, and bonded to other acrylic with crystal clarity. It can scratch, but the majority of the time they can be buffed out/removed with a heat gun. However, if dropped, it will shatter like glass. It is also available in a variety of colours. We often use acrylic on items such as medical cabinets, machine guarding, sneeze screens and signage.

Polycarbonate: Polycarbonate has extremely good clarity whilst holding a strength 30 times greater than glass. However, although easily machined, when formed, it tends to warp and fight back to its natural state. It is an extremely tough material and will not shatter unless extreme pinpoint force, but does scratch relatively easily. Polycarbonate can be bonded, but there is a much greater strength in welding. The main available colour is Polycarbonate is natural (transparent yet slight blue hue). We often use polycarbonate for high resistance impact guarding, conveyor guarding, riot shields and bus shelters.

PETG: The best way to describe PETG is being the cousin of polycarbonate. Although it is 70% the strength of polycarbonate, it can easily be formed, bent and manipulated. Also like polycarbonate, it will not shatter when dropped, just 'chip and mark'. This has a slightly stronger blue hue, but still considered a good optical look. We often use PETG for items which need the strength like Polycarbonate, but the ability to be bent and

formed without any negative repercussions. The majority of bent/formed guarding is suggested to be in PETG.

Polyethylene: Considered a different branch of plastic, Polyethylene falls into the 'engineering plastics' family. Although opaque, it can come in a variety of colours. Naturally it comes in in a translucent milky-white colour, although colouring can be used for virtually any colour required. It is extremely rigid and extremely resistance to heat and chemicals. It comes in several grades with each increase of grade number increasing the general resistance. PE300, PE500, PE1000 and HDPE (High Density Polyethylene). Polyethylene is commonly used for wear plates, skid plates, hinges, washers and high chemical resistance tanks.

The number of characteristics these, plus the hundreds of other materials that are available have to offer, can be daunting to research. On the other hand, you could save yourself some time and ask us instead? Here at S&D Solutions we have decades of experience in dealing with an enormous array of materials for a variety of unique purposes. As mentioned at the start, we can solve the problem before it even becomes one.

Why not give us a call?