

# Polycarbonate

PUBLIC INFORMATION

October 2023

A strong material with many vital uses for a safer Europe

Whilst not containing any chlor-alkali in the final material, polycarbonates are mostly made using this important chemistry. These important plastics are strong and some are even transparent giving them many uses in safety applications and more.

Approximately one million tonnes of polycarbonates are made worldwide each year. Polycarbonate is one of the top ten plastics used globally and represents one of the major uses of chlor-alkali in Europe (behind PVC and polyurethane).

In the first two possible steps of its production, both sodium hydroxide and chlorinated chemicals can be used to help join the individual plastic units (monomers) together into this important modern polymer. Neither chlorine, nor sodium/ potassium hydroxide are found in the final product but both are essential for its production.

Polycarbonate was discovered in Germany in the late 1890's but it wasn't until the 1950's before this material became more widely used.

## Properties and uses

Polycarbonate is very strong and whilst it doesn't easily break upon impact, it does not scratch easily either. Coupled with the fact that some polycarbonates are also transparent, this makes it an excellent coating for protective eyewear (including sun glasses) and various car parts such as head lamps.

Additionally, due to its strength, it finds a use in construction materials such as for roofing or where curved, transparent surfaces are needed such as domes and sky-lights. It can even be found in non-glass greenhouses to help grow tomatoes in your garden!

One very important use of this material is in safety applications. As previously mentioned, protective eyewear benefits from polycarbonate but also protective face-shields in factories and hospitals are made from this important chlor-alkali plastic. These face shields are also used by the police and fire-fighters for their protective equipment. Polycarbonate's properties also make it an excellent material for bullet resistant screens in banks and other secure areas. As polycarbonate is 10 times stronger than glass (and is also lighter in weight) it is also increasingly becoming a replacement for glass in pubs and clubs to prevent the dangers associated with smashed glasses. Even astronauts can rely on this material for their helmets!

*Polycarbonate helps keep fire-fighters safe*



Polycarbonate also helps us to have fun though. It is a common material in swimming goggles, sporting helmets, SCUBA diving masks, golf carts, motorcycles, light-weight luggage cases, small planes and helicopters. Many mobile phone and laptop cases are also made from polycarbonate.

Finally, whilst not as common these days, polycarbonate can be used as a surface to carry the data for CDs, DVDs and Blu-ray discs. You may have also seen security boxes in shops to protect these products from thieves. These boxes are made from, you guessed it, polycarbonate!

Much more about chlor-alkali at [www.eurochlor.org](http://www.eurochlor.org).



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