Bakker Elkhuizen

# Production process of sustainable acrylic

## Collecting

The collected acrylic largely consists of residual material that is released by processors during production. A part of old products, mainly consisting of displays, are also returned here and are collected from processors and offered to recyclers. At the recycling companies, the residual material is cleaned if necessary. The protective film is removed and the Polymethylmethacrylate (PMMA) is grind into small pieces.

The ground PMMA is then transported to various plate producers, who then first depolarize and distil it, after which the further production process takes place.

## Depolymerisation

Depolymerisation is a sequence of chemical reactions in which a polymer is broken down into its monomers or suitable building blocks (molar mass < molar mass of the polymer), whereby they can subsequently be reassembled into macromolecules.

## Distillation

Distillation is a thermal separation process to obtain vaporisable liquids or to separate solvents from substances that are difficult to vaporise and then collect them by condensation.

## Polymerisation

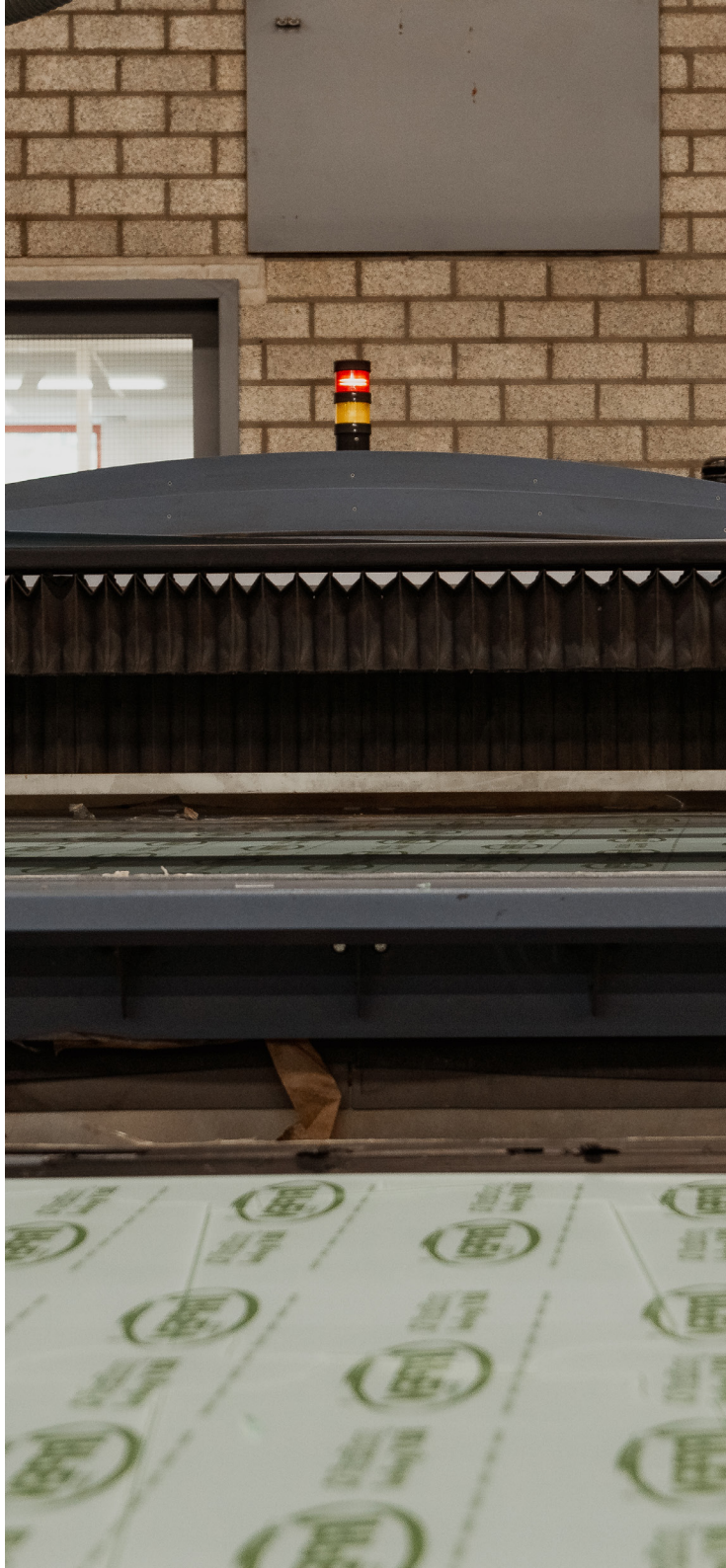
Cast acrylic sheets consist of the bulk polymerisation of methyl methacrylate with the monomer acting as the solvent. The monomer obtained from the depolymerisation and subsequent distillation is now partially polymerised to a thick syrup. To make the material ready for production again, additional ingredients are added to the syrup, such as initiators, mould release agents, UV-stabilizers and pigments.

## Casting

The mixture is then poured into the cast cell which consists of two pieces of polished glass, slightly larger than the finished sheet. The glass plates are held together with clamps that respond to the contraction of the mould caused by the shrinkage of the acrylic as it solidifies

## Drying

Upon completion of the solidifying process, the mould is dried in in various ovens, each with a lower temperature to minim the stress in the material. And then opened to remove the cast acrylic sheets.



## Edges are revised

Excessive edges are sawn off around the plate are visually checked individual-ly for any errors. The plate is provided with a protective film on both sides and stacked on pallets for transport.

## Cutting in shapes

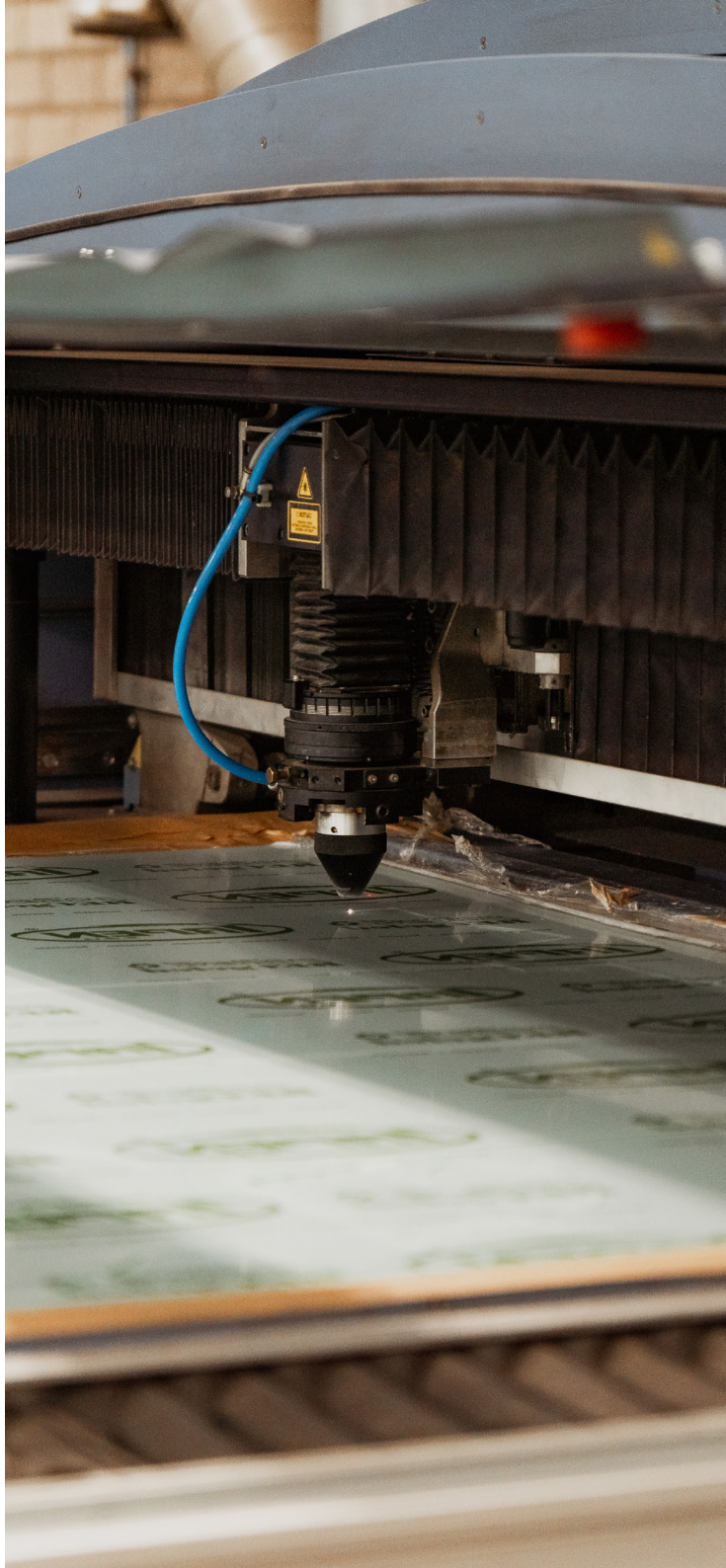
During processing, the material is cut into various shapes that are arranged in the best possible way on a 2x3 meter acrylic sheet. CO2 lasers then ensure an accurate cut with perfect edge finish.

## Cut parts placed on pallets

The cut parts are then removed from the machine and placed on pallets per product for further processing. The residual material that remains after the cutting process is placed in special bins and is then sent to the recycler to make new plates again.

## BakkerElkhuizen logo

The majority of the parts are then thermally bent and cooled in molds to achieve the final desired shape. The parts are then provided with a burned-in logo, after which they are further assembled.



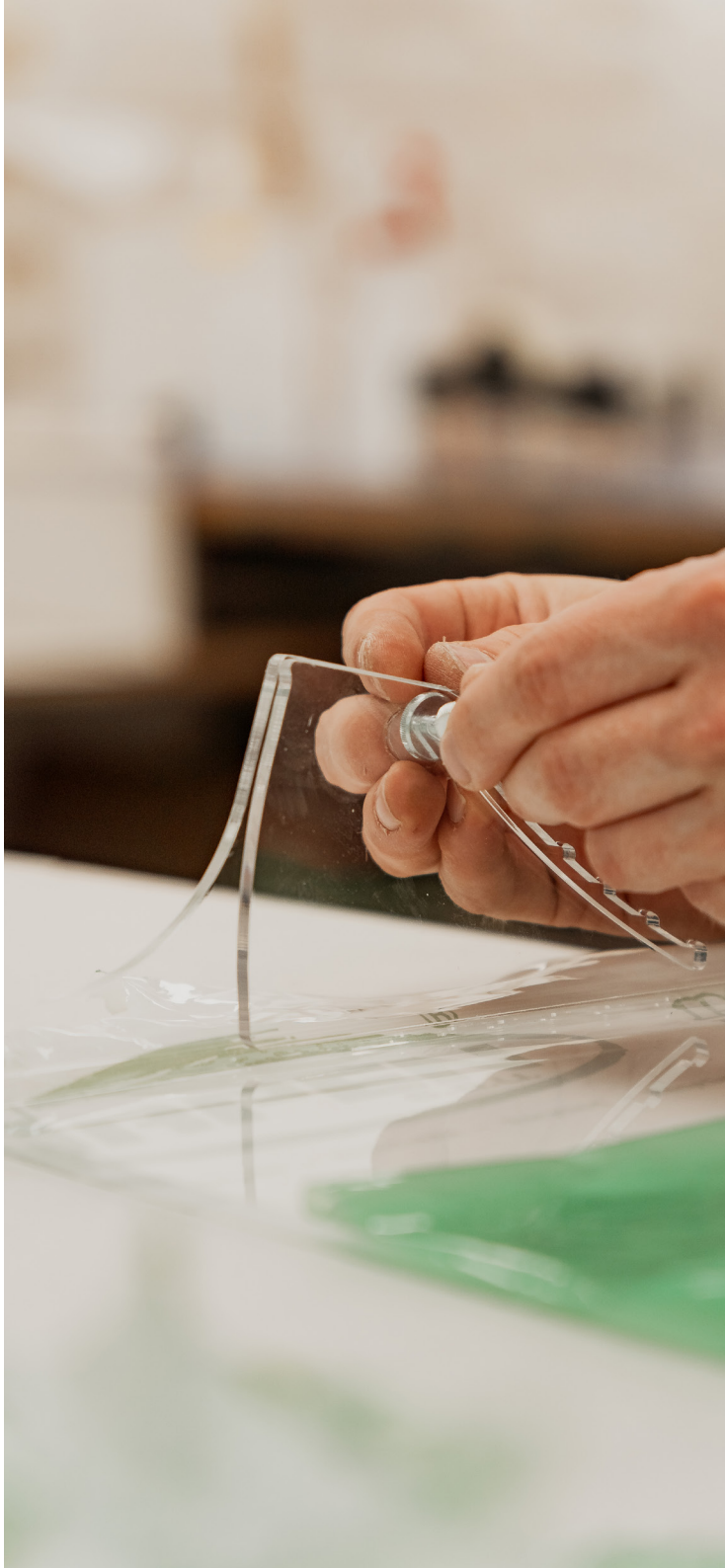
## Parts are connected

During assembly, part of the protective film is removed and the acrylic parts are connected with screws and nuts. In addition, the bottom of the products is provided with anti-slip.

In the next step, the rest of the protective film is removed and is placed in special bags for recycling and the end products are visually and technically checked.

## Packaging and transport

The final step is packaging. Here for is also just sustainable material used. The products are carefully wrapped in silk paper and then automatically boxed and stacked on pallets ready for transport.



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