



**MAGMA ACRYLICS** (Pty) Ltd

Exclusively developed acrylic adhesive products

## **MANUFACTURING GUIDELINES & PRACTICES**

### **Introduction to Gluing Plexiglas/Acrylic**

Whether you're looking to glue plexiglas acrylic for your next project or a simple repair, it's important to know and understand the best method to glue plexiglas acrylic together for long-lasting results. Gluing plexiglas acrylic together is slightly trickier than gluing materials like ceramic, wood, or paper, as it requires a different set of procedures and adhesives. However with a little know how you can successfully glue plexiglas acrylic to another piece of plexiglas acrylic like a professional.

#### **Can Super Glue be used to Glue Plexiglas/Acrylic?**

Well, the answer isn't clear? Yes you may be able to glue plexiglas acrylic pieces together with super glue, however, this particular bonding agent or glue doesn't dry clear or have the same strength or adhesive properties as a specific acrylic glue. With its convenient needle tip applicator, the application process is easy; however, it's in the drying where things begin to get cloudy; literally! Super glue is a bonding agent that works great on small projects, where dried glue is not visible or noticeable. When it's used as a bonding agent on larger items or when utilising transparent clear acrylic, this is where there's a huge noticeable difference, its not aesthetically pleasing or strong enough so the clear choice is either a Solvent or Polymerisation based glue that forms a permanent chemical bond that will either melt the material or molecularly fuse the materials together.

#### **Is it Gluing or Joining Plexiglas/Acrylic Sheets?**

Although it may be referred to as gluing or joining plexiglas acrylic, the answer is surprisingly both. A Solvent & Polymerisation based glues are used to adhere acrylic pieces together; however, it's a chemical reaction which occurs that softens and melts the acrylic surface that bonds the two surfaces together and permanently joins the two pieces together.

#### **How to Glue Plexiglas/Acrylic?**

If you've ever tried to glue plexiglas acrylic together with standard glue, then you've already found out it doesn't work or at the very least, it doesn't work for long. The issue is plexiglas acrylic can only be bonded with certain Solvent or Polymerisation based glues. The solvent based glues softens and melts the surfaces of the two acrylic pieces to form a chemical bond between the two surfaces. Once the two pieces start to cure, any reduced movement with the help of jigs, clamps or vices will greatly assist the bond strength of the pieces being permanently bonded. A polymerisation glue is a liquid acrylic monomer that has an initiator that reacts via UV light or a separate catalyst, thus activating a number of monomer molecules which will then attach to further molecules, activating them to subsequently form a chain, thus resulting in an extremely strong bond.

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**ATTENTION!** Before working with any plexiglas acrylic be sure safety protocols are in place.

Always work in a well ventilated space when gluing plexiglas acrylic together with a solvent based glue. Solvent based adhesives release strong fumes. Whether it's gluing something small, a repair job, or an ongoing project inhaling the fumes for any period of time may cause light-headedness, headaches, and other complications.

Use protective gear such as goggles, gloves, and a face mask as solvent based glues can cause skin irritation, so keep it away from your eyes, mouth, and hands.

\*As a general reference listed below are some of the materials available on the market.

- Cast Acrylic
- Extruded Acrylic
- Polycarbonate
- Expanded PVC Foam
- HDPE PP
- Styrene
- PET-G
- Polypropylene
- UHMW Polyethylene

## 1. SET UP THE WORKSPACE

Make sure your workspace is well ventilated. Next, ensure you're gluing plexiglas acrylic pieces on a compatible surface. A table made from concrete, metal, or glass is ideal. Do not glue plexiglas acrylic on a table constructed of plastic as the Solvent & Polymerisation based glues being used may cause the acrylic to attach to the surface, secondly this can damage the table and the acrylic.

## 2. PREPARE THE PLEXIGLAS ACRYLIC

Before gluing the plexiglas acrylic pieces, ensure the materials are prepared for the project. Check the plexiglas acrylic pieces for bumps, chips, or cuts, any of these imperfections can compromise the integrity and strength of the bond. For rough areas use a router or light grain sandpaper to even out plexiglas acrylic edges, and be careful not to induce too much heat into the material as this can cause stress cracks to appear during the bonding process.

Plexiglas acrylic should also undergo a basic cleaning and drying before gluing. Remove any dirt, dust, or oils that may have accumulated on the plexiglas acrylic during handling or storage. For any plexiglas acrylic you should follow specific cleaning guidelines, using specific commercial cleansers like Magma Bond M1 which is a specially formulated product that constitutes as both a cleaning & dilution solution.

Next, position the plexiglas acrylic pieces in the exact positions you would like them to be glued. Then secure the plexiglas acrylic pieces using a jig, clamps, wooden blocks, or by having another person hold the acrylic firmly in place. Once the plexiglas acrylic pieces have been arranged to the desired configuration, it's time to apply the Solvent or Polymerisation based acrylic glue.

## 3. APPLY THE GLUE

There are several types of Solvent & Polymerisation based acrylic glues available from the Magma Bond range. For the purposes of this process I will focus on one of the most popular Solvent based plexiglas acrylic glues on the market called Magma Bond E1. This type of glue is made with a Methylene Chloride base.

If the adhesive isn't already in the applicator bottle, then carefully transfer the acrylic glue to an applicator bottle (with a cap that is outfitted with a needle tip) using a funnel. A needle tip prevents excess glue from flooding the acrylic pieces. Once the bottle is filled to 75 percent capacity, stop filling with glue and attach the cap. Gently squeeze the bottle to release the air inside.

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Turn the glue filled applicator bottle upside down and place the needle tip in the farthest corner of the joined acrylic pieces. Then, lightly squeeze the bottle pulling it towards you, making sure that the adhesive is filling all seams and spaces as you move the bottle. The glue will be pulled into the joint and seams via what is known as capillarity, capillary action, capillary motion, or wicking. Move at a consistent pace in a continuous motion for a clean seamless look. Avoid starting and stopping part way through gluing to prevent an accumulation of glue and compromising the appearance. If this occurs and glue spills, floods or pools during the application, do not wipe it off immediately, rather let it dry. Wiping or applying pressure to an area with excess acrylic glue will permanently damage the acrylic. Instead, wait for the glue to evaporate, and clean the area, as necessary.

## 4. ALLOW THE ADHESIVE TO SET/CURE

Once the acrylic pieces have been glued together ensure they remain secured together for about 1 to 2 minutes (clamps may be used) but do not move. Soon after applying, sometimes you'll notice the acrylic's joined edges are a cloudy white colour, this scenario only happens when the plexiglas acrylic is cold and performed in damp conditions. Typically as it dries this will slowly become more transparent as both the moisture and solvent evaporate. Once 1 to 2 minutes have elapsed you can stop holding the acrylic pieces together, as a light bond has already been formed between the acrylic pieces. However, do not put significant pressure on the joined acrylic piece until 24 hours have elapsed. While it only takes 1 to 2 minutes for the acrylic to create a light bond, a strong bond requires the acrylic solvent glue to cure and completely dry.

## 5. EXPOSURE CONTROLS/PERSONAL PROTECTION



### PROCESS CONDITIONS

Use engineering controls to reduce air contamination to permissible exposure level.

### ENGINEERING MEASURES

Provide adequate ventilation.

### RESPIRATORY EQUIPMENT

Wear suitable respiratory protection.

### HAND PROTECTION

Protective gloves should be used if there is a risk of direct contact or splash.

### EYE PROTECTION

Wear splash-proof eye goggles to prevent any possibility of eye contact.

### OTHER PROTECTION

Wear suitable protective clothing as protection against splashing or contamination.

### HYGIENE MEASURES

Use appropriate skin cream to prevent drying of skin. Wash at the end of each work shift and before eating, smoking and using the toilet. When using chemicals do not eat, drink or smoke.