

Vacuum Former

Information about vacuum forming plastics in the workshop.

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What vacuum forming equipment do we have in the workshop?

We have 2 vacuum forming machines in our plastics room.

- CR Clarke 1820 vacuum former uses sheets 508mm x 458mm
- CR Clarke 725FLB vacuum former uses sheets 458mm x 254mm

Vacuum forming is ideal for making plastics packaging and reusable moulds.

The process involves heating a plastic sheet until soft and then draping it over a mould. The mould can be a pre-existing object or something that has been made. A vacuum is applied pulling the sheet into the mould. The sheet cools down quickly and can then be removed from the mould.



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How do I book the vacuum formers?

All students must book a workbench to be in 3D workshop. Booking a workbench for a 3 hour slot gives you a space to work and access to all necessary tools, sundries and equipment with technical supervision and guidance.

We will only be accepting booked appointments to comply with social distancing guidelines. No walk ins will be accepted.

You can book a workbench via the [Online Resource Booking \(ORB\)](#).

You must complete an online Health and Safety induction before booking a workbench.



The vacuum formers are yellow machines. This means students can use the equipment but must get staff approval before each use. A member of staff will also supervise.

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What materials can I use with the vacuum formers?

Vacuum formers should only be used with thermoplastics such as:

- PVC clear sheet available from [eStore](#).
- [Styrene](#) sheet, available in many colours from [eStore](#).
- Foam sheet for vacuum forming can be purchase in specialist shops.

Some plastics can release highly toxic fumes when heated. Do not heat other types of plastics on the vacuum former.

Suitable mould materials are:

- Wood, such as [plywood](#) and timber, works well.
- [Plaster](#) works well.
- [Styrofoam](#) works for some shapes but will not withstand multiple time in the vacuum former.

Unsuitable mould materials

- Hollow thin plastic shapes would be deformed out of shape.
- Hollow thin cardboard shapes would be deformed out of shape.
- Standard expanded polystyrene is unsuitable as it will melt when in contact with the hot plastic. This is the white polystyrene that is often used as packaging foam.

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How do the vacuum formers work?

Before vacuum forming you must prepare the shape that you are forming around. These are also known as moulds or tools. This can be a pre-existing object or an object you have made. Either way the material it is made from needs to be strong. It must withstand the heat and pressure of the vacuum former.

Moulds should not be square or have negative angles. These will make it extremely difficult to remove the formed plastic in one piece. A draft angle of 1 or 2 degrees will make it easier to remove the formed plastic. The surface of the mould should be as smooth as possible.

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How do I use the vacuum formers?

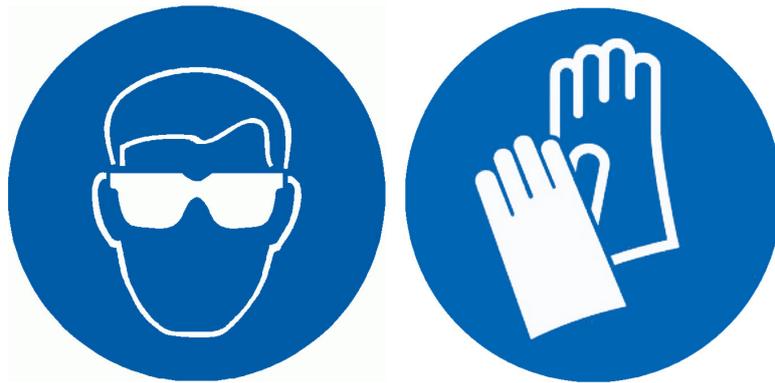
To use the vacuum former:

1. Ensure you are wearing correct [PPE](#).
2. Ensure the extraction hood is open and positioned above the machine.
3. Pre-heat the vacuum forming machine for about 5-10 minutes.
4. Place the mould into the raised bed of the machine and lower the bed using the lever on the left side of the machine. The mould should be placed in the middle of the bed and away from other moulds if there is more than one.
5. Clamp a sheet of vacuum forming plastic above the mould.
6. Apply the heat by sliding the heating element on top of the plastic sheet. The heating time is usually between 10 to 20 seconds depending on the thickness of the plastic sheet.
7. Remove the heating element by sliding it back.
8. Raise the mould by lowering the lever on the left side of the machine. Ensure it locks in place at the top.
9. Switch on the vacuum pump, which sucks out the air and the mould will be shaped in front of you.
10. Allow a few seconds for the plastic to cool down and reverse the airflow, from suction to blowing. This will help to release the plastic shape from the mould.
11. Lower the bed with the mould.
12. Unclamp the plastic sheet.
13. If the plastic is stuck to the mould you have to take it off the mould by hand. This can be challenging for some shapes, but very easy for others.
14. Your vacuum form should now be ready for trimming or any other follow on work you want to do to it.
15. When finished turn off machine and leave area clean and tidy.

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What Personal Protective Equipment (PPE) do I need to use the vacuum formers?



You must wear safety glasses and heat resistant gloves when using this machine. Tie back any long hair and tuck in loose clothing.

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