**Moulding and casting: Review the safety data sheets for each of your molding and casting materials, then make and compare test casts with each of them**

Moulding and casting week

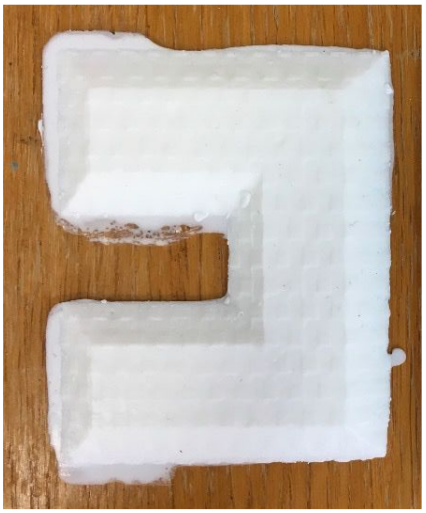
FABLAB BRIGHTON 2018

Compare properties:

- Curing time
- Surface finish
- ease/difficulty to work with/degass
- stiffness/toughness/texture

# Our resins and plasters

## Smooth-Cast 305 - white

### Datasheet

https://www.smooth-on.com/tb/files/Smooth-Cast_300q,_300,_305___310.pdf
https://www.smooth-on.com/msds/files/Smooth-Cast_300,_300Q,_305,_310.pdf

PPE: chemical-resistant gloves and eye protection
Main risks: curing is exothermic (up to 100°C). Do not get in eyes, mucous membranes or on skin.
How to store: Store in cool dry, well-ventilated area. Shelf life of product is reduced after opening. Immediately replacing the lids on both containers after dispensing product will help prolong shelf life.
How to use: Mix parts 115A:100B by weight. MIx in a warm, low-humidity environment. A release agent is necessary to facilitate demolding when casting into or over most surfaces (though we didn't use one when casting from silicone)
How to dispose: Mix all poured resin and dispose of when cured.

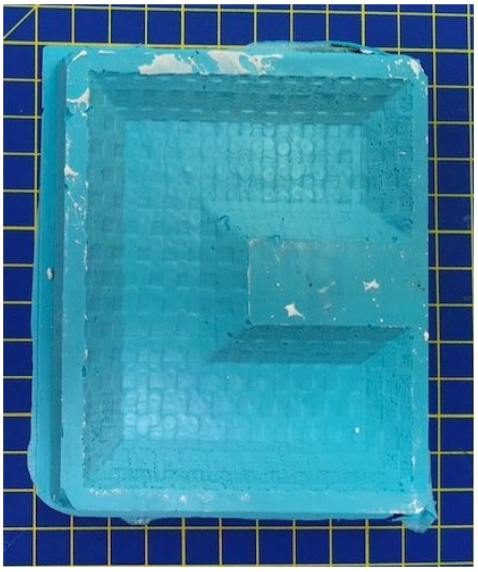
# Smooth-Cast 326


## Datasheets

https://www.smooth-on.com/tb/files/SMOOTHCAST_325_326_327_COMBO_TB.pdf
https://www.smooth-on.com/msds/files/Smooth-Cast_325,_326,_327.pdf

PPE: Wear safety glasses, long sleeves and rubber gloves to minimize contamination risk
Main risks: Harmful by inhalation. Irritating to eyes, respiratory system and skin.
How to store: Store in cool dry, well-ventilated area. Shelf life of product is reduced after opening. Remaining product should be used as soon as possible.
How to use: Mix 1:1 by volume. Pot life is 7-9 minutes. A release agent can be used, but is not necessary for silicone moulds. This resin is specially designed to take tints, at about 0.5% by weight of one part.
How to dispose:  Mix all poured resin and dispose of when cured. Very toxic to aquatic organisms may cause long term adverse effects in the aquatic environment.

# Oomoo 25

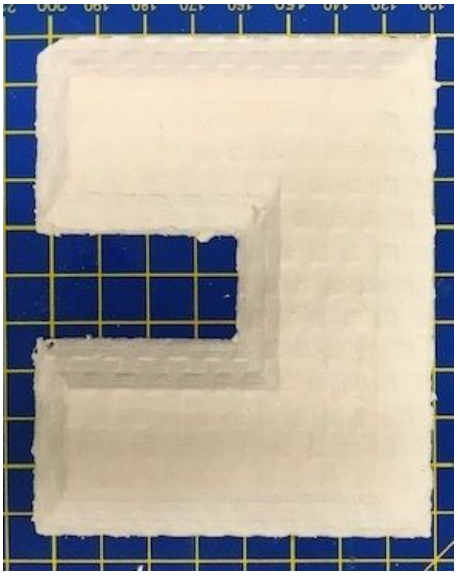



## Datasheets

https://www.smooth-on.com/tb/files/OOMOO_25_30_TB.pdf
https://www.smooth-on.com/msds/files/OOMOO_Series.pdf

PPE: Wear chemically protective gloves to prevent prolonged or repeated skin contact. Wear protective eyeglasses or chemical safety goggles. Wear vinyl gloves only. Latex gloves will inhibit the cure of the rubber.
Main risks: No hazardous ingredients
How to store:
How to use: mix 1:1 by volume. A release agent will make demolding easier but is not necessary. Pot life is 15 minutes. Mixture should have a uniform color with no color streaks.
How to dispose: Absorb or scrape up excess into suitable container for disposal.

# ZP150

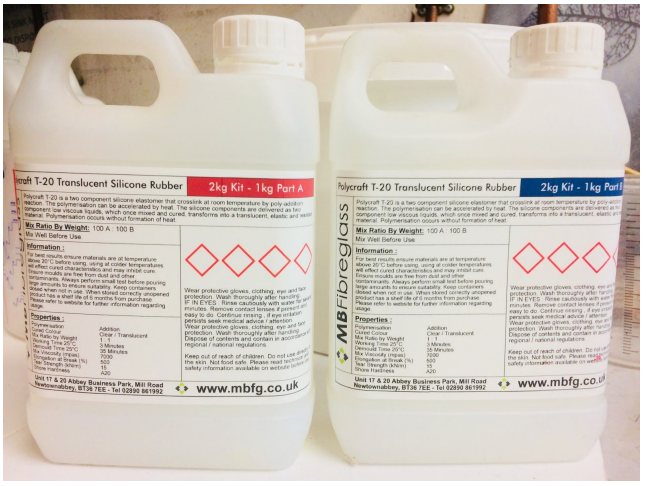



## Datasheet

https://www.shapeways.com/rrstatic/material_docs/msds-sandstone.pdf

PPE: Avoid skin contact by use of nitrile, PVC-coated or like type chemical resistant gloves. Safety goggles for dust are recommended during powder additions and cleaning.
Main risks: May cause irritation of the eyes, mucous membranes, and respiratory tract. May be harmful by inhalation or ingestion. Eye contact may cause mechanical abrasion with burning, tearing and redness. Ingestion may cause inflammation of the mouth, throat, esophagus and/or stomach.
How to store: Store in a cool, dry, ventilated area away from sources of heat, moisture, strong oxidizing materials and explosives. Keep containers tightly closed.
How to use: This plaster was not really designed for casting, we simply put 50g of this in a cup and then added water until it was ‘double cream’ consistency.
How to dispose: do not allow to enter the storm or sewer drainage systems.

## T20 and Silastic 3481


### Datasheets:

http://www.mbfgfiles.co.uk/datasheets/silastic_3481_msds.pdf
http://mbfgfiles.co.uk/datasheets/T-20_tech.pdf
http://mbfgfiles.co.uk/datasheets/t20a_sds.pdf
http://mbfgfiles.co.uk/datasheets/t20b_sds.pdf

PPE: Use proper eye protection - safety glasses as a minimum.
Main risks: Not hazardous. Avoid contact with skin and eyes.
How to store: Use reasonable care and store away from oxidizing materials.
How to use: mix 1:1 by weight (T20) and 10 base:1catalyst by weight (GP3481). A release agent will make demolding easier but is not necessary. Pot life is only about 1 minute (T20) and 15 minutes (GP3481). Mixture should have a uniform color with no color streaks.
How to dispose: Dispose of saturated absorbant or cleaning materials appropriately, since spontaneous heating may occur.

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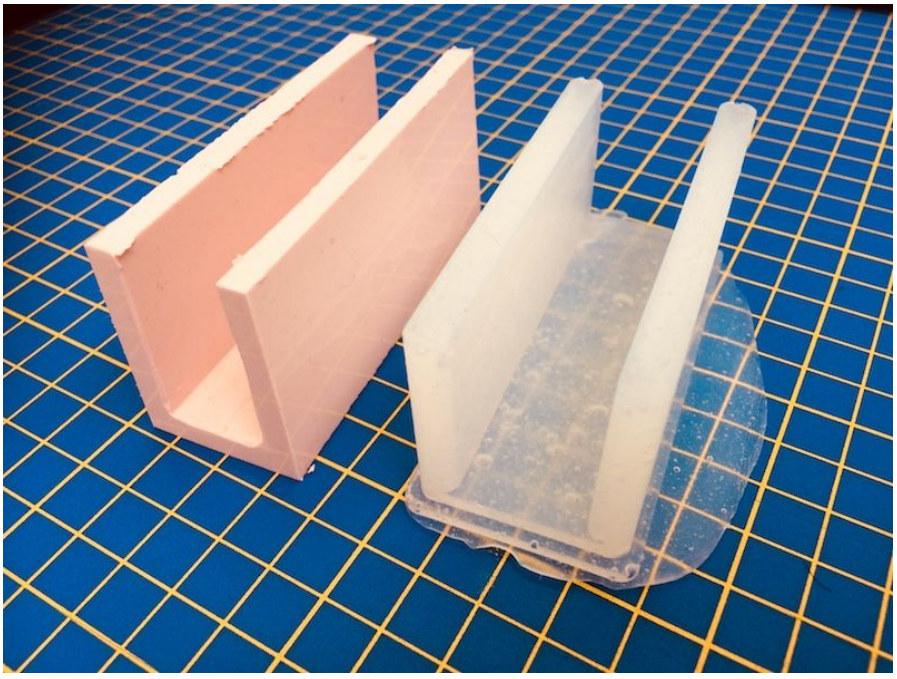
# Comparing properties

Des Covill compared the quick drying clear T-20 with the pink GP-3481 silicone rubber as part of his spinal cord holding project. The pink model was smoother, with a (mostly) great surface finish.

As a material, it is much more flexible too, and not nearly as strong. The clear silicone is much tougher, more hard wearing.

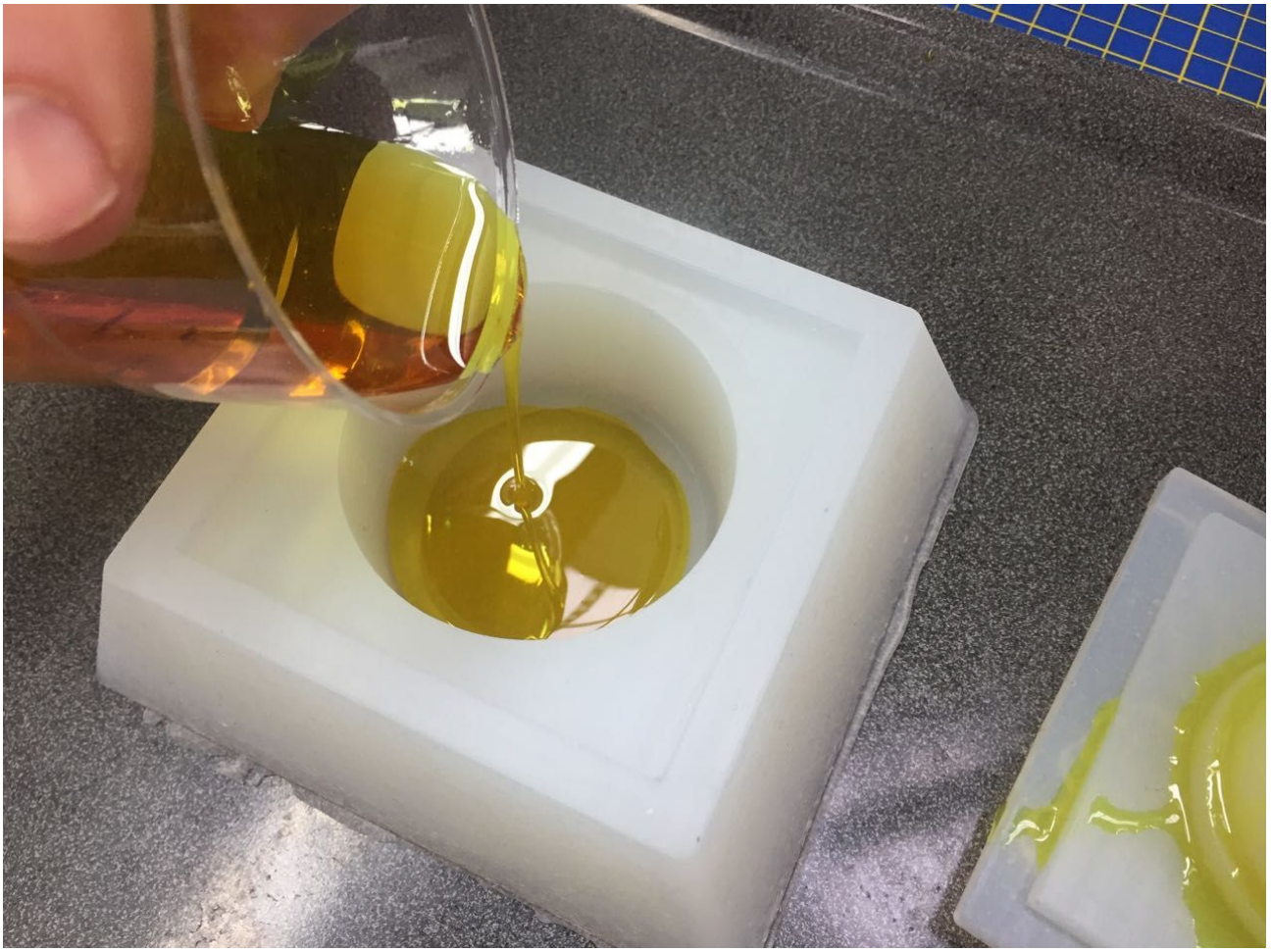


## Smooth-Cast 326

Andrew Sleigh tried using both of the Smoothcast resins to make small pots. First, he used the Smoothcast 326, which is a transparent resin, to which he added some colourant.

It is a very easy resin to work with, having a 7-9 minute pot time, and being very thin, until it starts to cure. So mixing the two parts was easy, as is pouring the mold. It releases well from the silicone mould, and has a very hard finish, which works well for this type of object. It is also easy to sand down, at least to a matte finish.

However, without the use of a vacuum chamber, there were lots of air bubbles in the resin, which were clearly visible in due to its transparency. These could be used to creative effect, as they also create nice lighting effects.



## Smooth-Cast 305

For the same project, Andrew also tried the other Smooth-Cast resin, 305. This two part resin is transparent when mixed, curing to an opaque white.

It was similarly easy to work with, however the final result was quite different. The surface feel is much more ‘plastic-y’, slightly warm to the touch, and the part had a small amount of flex. This could make it more robust in some applications, but wasn’t the right feel for this part.

While the opaque cure hid most of the air bubbles, there were still some surface imperfections caused by small air bubbles.