

3D FORMING

Thermoforming of plastic material



The **thermoforming** is the technology that uses a sheet of thermoplastic material, made malleable by heat, positioning this one on an **object** (a model), sucking the air (between the object and the sheet), so the sheet takes the **form** of the **model**.

Robot Factory developed the **3D FORMING** system - thermoforming for the production of **3D molds** or finished objects in various **thermoplastic materials**, for making objects of different shapes and uses.

3D FORMING is equipped with a special electric armored resistor that heats (for radiation) the **thermoplastic sheet**. The thermoforming of preheated plastic is achieved by using a common vacuum cleaner to create the vacuum. The plastic sheet is put on the object (chosen as template) and, for the sucking effect, it reproduces **three-dimensionally** the shape, copying all the sinuosities of object itself. The modeling of the sheet is obtained for the suction effect that let to the plastic, made malleable, of wrap the model and follow the shape. **3D FORMING** has been entirely engineered of **stainless steel**, this characteristic makes it suitable also for the treatment of **food-grade** objects (using non-toxic material).



The complete **process** takes a few minutes, it starts by putting the plastic sheet on the thermoforming device, you have to wait 1-2 minutes until the plastic sheet becomes malleable, then you have to turn on the vacuum cleaner and to put, using a gentle pressure, the plastic sheet on the template (positioned on the device grid). In just a few seconds of air sucking the formed piece is ready, then just wait that the sheet is cold (just to air effect) and it can be separated from the object (template) and use it. Of course, the molding time depends on the type of plastic used, the thickness of the plastic sheet, and also on the complexity of shapes.



The 'thermoplastic' materials usable for **making** the molds using the **3D FORMING** system are various, to meet the needs of many different applications.

Below we mention a few:

Molds - in general, in all fields in which you need to use the molds: decorative arts, gastronomy, pastry, lighting, customization of common objects, packaging, gadgets, jewellery, parfumes, watches, eyewear, modeling, toys, antiques, etc.

Odontology - the thermoforming process is fundamental in odontology for the production of transparent orthodontic aligners, using a **3D printed model** with high resolution (such as those obtainable with 3D printers that use the DLP technology produced by **Robot Factory**), printed using rigid and temperature resistant material.

School - with the **3D FORMING** system, the thermoforming can be also used in schools to develop interest of pupils, involving them in the construction and decoration of the objects produced by this system. In the context of teaching this device can be a great aid for the creation of learning objects usable in case of dyslexia, visual impairment, and in general in cases of learning difficulties. In schools in which there are already **3D printers**, 3D printed objects can be used as **models** for the thermoforming.

The **3D prints** can be used as template for the thermoforming of objects of various use. In addition, the thermoplastic sheets may be previously colored printed, and then used for create, with the **3D FORMING** system, objects of various shapes, **already decorated**.

Basically, this system is proposed as a valid alternative to the injection technique (used by the industry to produce plastic objects), especially in cases where:

- The number of parts to be produced is reduced
- The maximum production flexibility is required (lots of different finished parts)
- The thickness required on the sides of mold is very thin
- The requested size is bigger than a few millimeters.

The **3D FORMING** system allows to print easily **thermoplastic sheets** from 0.2 to 1 mm thickness. The material supplied by **Robot Factory**, as consumable, for use with the **3D FORMING** system, it is non-toxic (food compatible) and recyclable: **PETG** (polyethylene terephthalate modified with glycol) **certificate for the contact with food** (commonly used for pastry / Dining molds), **HIPS** (High Impact Polystyrene) **certificate for the contact with food products** (commonly used for packaging and for disposable dishes), **etc.**

The material, available for use with the **3D FORMING** system, is supplied in sheet of A4 size (297 x 210 mm).



TECHNICAL SPECIFICATIONS:

Overall dimensions: 460 x 260 x 380 mm

Weight: 9 Kg approximately

Useful size for process:

- 250 x 170 x 120 (mm)
- using flat adapter: 120 x 100 x 120 (mm)

Power supply: 230v / 50-60Hz / 600W / 2.6A

Suction tube: 180 cm / Ø 32 mm.

Adapters for vacuum cleaner: Ø 54 mm, Ø 57 mm, Ø 60 mm.

Declaration of **EC conformity**.

1 (one) year of **warranty**.



Thermoforming of two objects



Ceramic plaster



Thermoformed PETG



3D FORMING *backside*

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