

## Thermoforming basics - Part 1 Systematic finishing of thermoformed appliances

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**W**hen the production of thermoformed appliances is discussed, the debate mostly centres on issues such as *which type of machine to use?* or *what material is best for the purpose?* These issues however are only half the equation. When these issues are resolved and the appliance has been formed, the question that remains is *how do I finish this ready for insertion?*

Fortunately, finishing thermoformed appliances can be predictable and systematic - requiring the minimum of equipment.

In fact, every thermoformed appliance can quickly and efficiently be finished with just 4 finishing instruments.

### Step 1 - Positioning the model for forming



Although not strictly a part of the finishing process, the area of the model that is covered with material after the appliance has been formed has a direct bearing on how easy it will be to finish. Nowadays, most thermoforming machines have the ability to use granules to position the model. Granules allow you to embed the model in such a way that only the areas of the model that require material coverage are exposed.

The advantages are easier removal from the model for final finishing, better use (less stretching and thinning) of the material and less need for model trimming.

### Step 2 - Releasing the Appliance



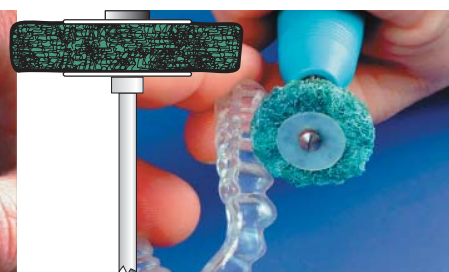
After removing the foil from the model, our next task is to release the appliance from the foil. This is best achieved with high speed twist drills - thin 1mm diameter for materials up to 1.5mm and heavier duty for materials up to 5mm. The technique is simple; operate the drills at around 35,000 rpm and cut as accurately as possible to the finished outline of the appliance. This will quickly release the appliance from the foil and leave us with a rough outlined shape of the finished case.

### Step 3 - Final Shaping



The appliance can now be finally shaped. This is achieved with a tungsten carbide bur, again operated at high speed (35,000rpm). Both soft and hard materials respond well to these burs. The aim here is to define the absolute final shape of the appliance ready for polishing. Take care not to mark the thermoformed surface where not necessary.

### Step 4 - Final Finishing



All that is now left to do is final smoothing and polishing. Smoothing and homogenizing the surface is quickly done with silicone impregnated wheels. To achieve maximum efficiency and life span, always operate these instruments at less than 10,000 rpm. This will produce a smooth, comfortable, clinically acceptable finish. For even higher levels of shine, hard materials can generally be polished with denture type high shines while the high shine of soft appliances such as mouthguards is best restored with hot air.

Following a consistent routine when finishing thermoformed cases results in more predictable appliances, less material wastage as well as saving money on equipment and inventory items. Staff training and job hand-overs become far quicker and easier using these established methods and thermoforming becomes even more satisfying."

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