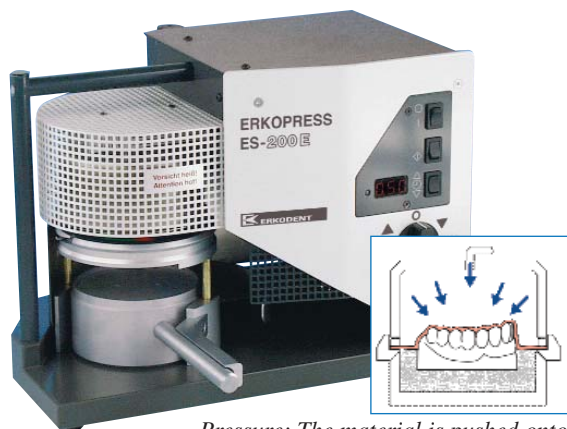
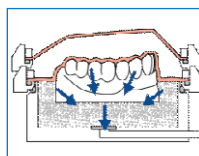


Thermoforming basics - Part 2 Choosing a thermoforming machine

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Pressure: The material is pushed onto the model. If the forming pressure is high enough, there are always good results



Vacuum: The material is pulled onto the model. Rapid (sudden) vacuum shows good results.



Regardless of whether you're a first time buyer or an experienced user seeking a replacement unit, purchasing a thermoforming machine is not a simple decision in today's marketplace. Apart from the large price range (from less than \$1000 to over \$5000), you are faced with making a decision between at least 3 different basic methods of adapting the thermoforming materials and many different machine features, functions and design philosophies.

What do you want to make?

The applications for dental thermoforming are numerous - including mouthguards, splints, impression trays, base plates, temporary crowns and bridges, orthodontic appliances, snore guards, bleach trays, temporary dentures and much more.

Different machines have unique characteristics that predispose them to suit production of some appliances better than others.

So when considering a machine to purchase, it's important to choose the unit that is best suited to produce the appliances that you want to make now and also to consider what you may wish to do in the future.

Pressure versus Vacuum

Modern thermoforming machines are basically categorized as either pressure systems or the newer rapid vacuum designs, both of which produce first class results.

Pressure machines operate from an external compressed air supply at pressures of up to 5 atmospheres.

These machines are renowned for having the advantage of very high thermoforming power but require more attention to model quality and blocking out procedures, a clean compressed air supply and because the thermoforming operation takes place in a closed chamber, the model is not accessible during the forming process. These machines are "workhorses" and can be used to make any appliance. They are most often used by commercial dental laboratories that have good facilities for high quality model production and highly trained operators.

Pressure machines are recommended for high volume workloads by experienced operators, are especially good for orthodontic bracket transfer appliances and are essential for techniques that involve self-cure acrylics and laminating mouthguards with a clear outer layer.

The newer type rapid vacuum machines have become increasingly popular in both labs and the dental practices. They operate by creating a vacuum in an internal reservoir using a self-contained pump. When the heated foil is placed over the model, the vacuum chamber is automatically released, pulling the foil rapidly down over the model; it is this rapid forming action that allows the creation of the detail and fit which is clinically equivalent to pressure forming. This differentiates the newer

machines from the old motor driven square type vacuum machines which begin to create a vacuum after the foil is placed over the model, hence the thermoforming process proceeds relatively slowly allowing the hot material to cool during forming, preventing fine adaptation.

The rapid vacuum machines have the advantage of not requiring a compressed air supply, are quiet, easy to use and leave the model accessible during the forming process. Access to the model can also allow the use of articulator type attachments which make it possible to add the bite into the appliance or modify the surfaces at the same time as thermoforming is taking place.

The less aggressive nature of these machines can make appliances, in particular hard retainers and splints, more passive and comfortable for patients.

These machines are preferred for general production of bleach trays, splints (with articulator-type attachment), laminated mouthguards, custom trays, orthodontic retainers etc. Simple operation and ease of use makes these machines more suitable for use by general dental office staff.

Peter Herring is a dental technician and prosthetist based in Perth. He is the Australian agent for Erkodent thermoforming machines and also runs a busy lab dedicated to thermoformed appliances. For more information, call 1800-242-634 or pjh@erkodent.com.au