

THERMOFORMING TIPS

Why We Recommend a Pressure Thermoformer

We use a proprietary polyurethane (TPU) resin we formulated in making our Zendura materials, which accounts for their tough and somewhat rigid polymer backbone. So, they require a higher applied pressure to achieve excellent definition of the gingival margin and texture and ideal fit to the teeth after thermoforming.

A pressure thermoformer (e.g., Biostar, Ministar, Druformat Scan, etc.) can apply as high as 90 psi (6 Bar) of forming pressure to form the appliance, while a conventional vacuum thermoformer can apply at best 12-16 psi (1 Bar) -- a factor of 6 to 1 increase in applied pressure. While we have many customers who successfully thermoform Zendura materials using a vacuum thermoformer, most of our customer, especially our orthodontic doctors and labs, use only pressure thermoformers.

Benefits of Using a Pressure Thermoformer

Using the higher forming pressure available with pressure thermoformers has many benefits:

- Excellent teeth adaptation of the Zendura sheet to the model every time you perform a forming process.
- Ease of thermoforming.
- Faster speed.
- Improved continuity.

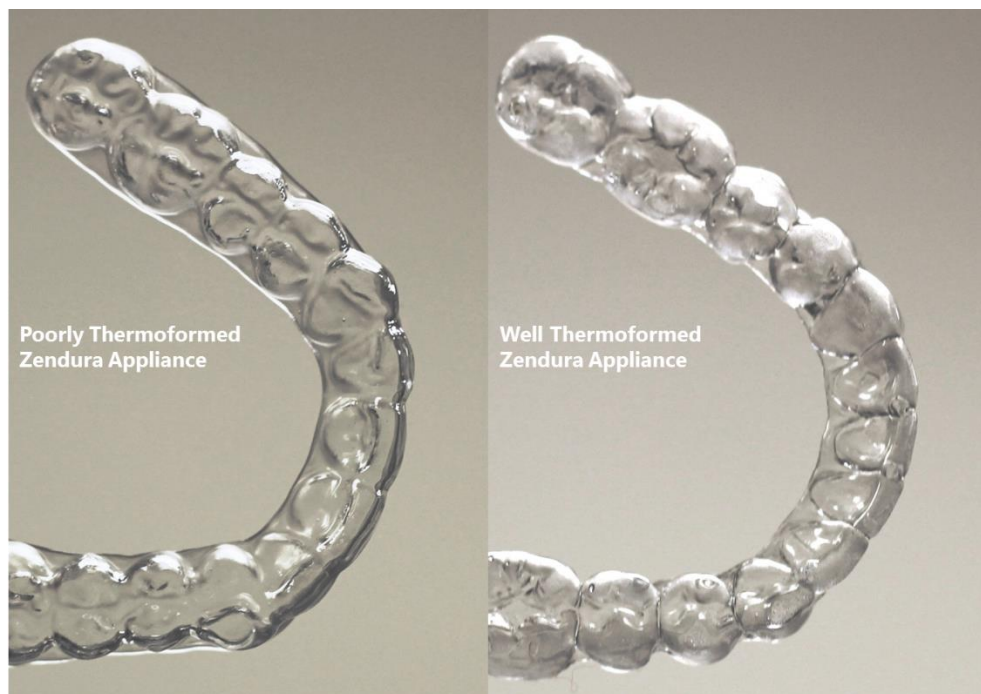
The Most Popular Pressure Thermoformers

- Walk into any orthodontic practice and you will see mostly Biostars, Ministars and Druformat Scans. Most orthodontic practices use only pressure thermoformers. Very rarely will you see a vacuum thermoformer.
- Walk into any mid-size to large orthodontic lab and you will see mostly Biostars and the occasional Ministar and Druformat Scan. Very rarely will you see a vacuum thermoformer.

Most dental practices use vacuum thermoformers, which cost a fraction of what pressure thermoformers cost and are sufficient for thermoforming appliances like bite guards, splints and bleaching trays. That said, the newer vacuum forming systems like the [Erkoform-3d™](#) can achieve excellent teeth adaptation. Even so, they are not really suitable for an orthodontic practice fabricating in-office a high volume of aligners and retainers.

Comparison of Good Adaptation With Poor Adaptation

Regardless of the type of thermoformer you are using, the pictures below are a good check-point showing a well-thermoformed versus a poorly-thermoformed appliance.



Purchasing a New Thermoformer

If you are an orthodontic practice or orthodontic lab considering purchasing a new thermoformer, we recommend buying a pressure thermoformer if your budget will accommodate the cost. If cost is a concern, you may want to try looking on Craigslist or eBay for a lease return or used thermoformer. Occasionally leasing companies will put lease return units on Craigslist or eBay to monetize them, since they typically write leases only on new equipment.

Feel free to contact our Customer Service department for additional guidance on thermoformers.

Troubleshooting

We occasionally receive inquiries from customers who did not achieve the expected results when fabricating a Zendura material into an appliance using our recommended thermoformer configuration settings and heating and cooling times. There are several possible reasons:

1. **PROBLEM: POOR MATERIAL ADAPTION**

POSSIBLE SOLUTION:

First confirm that your forming pressure is sufficient. Then try increasing the heating time in 5 secs increments until you achieve good adaptation. For fine tuning the adaptation, try increasing the cooling time by 10 secs. Be sure to consult our IFU for the Zendura product you are thermoforming for our recommended forming pressure and the configuration code and heating and cooling times for the specific thermoformer you are using. You can download a PDF of the IFU from this website by [clicking here](#).

2. **PROBLEM: POOR MATERIAL ADAPTION**

POSSIBLE SOLUTION:

Many newer thermoformers have better and sometimes more advanced heating elements so require a shorter heating time to achieve good material conformation. But older units have weaker heating elements and lower forming pressure because their heating elements and pressure components (e.g., rubber O-rings and other gaskets) are near the end of their service life and should be serviced or replaced. However, many older units are still usable. To achieve better teeth adaptation, try adjusting the heating time up by 5 secs. If you are still not achieving good adaptation, try adjusting it upward by another 5 secs.

3. **PROBLEM: POOR MATERIAL ADAPTION**

POSSIBLE SOLUTION:

You used a forming pressure lower than 4 Bar, so insufficient pressure was applied to the material to achieve good adaptation to the dental model. Always remember to use a forming pressure of 4 Bar or higher to achieve good teeth adaptation.

4. **PROBLEM: APPLIANCE FITS TEETH TOO TIGHTLY**

POSSIBLE SOLUTION:

Try lowering the heating time by 5 secs. If the appliance is still fitting the teeth too tightly, try reducing it by another 5 secs.

5. **PROBLEM: WEBBING IN THERMOFORMED SHEET**

POSSIBLE SOLUTION:

Webbing could appear in the thermoformed sheet when the heating time is too high. Try lowering the heating time by 5 secs. If you are still seeing webbing and creases, try reducing it by another 5 secs.