



Technique Guide



Porcelain Compatibility

*The V-Tec line of refractory materials is compatible with most ceramo-metal porcelains. **V-Tec regular** is for Vita Omega, Degussa Duceram, Shofu Vintage and similar porcelains. **V-Tec Hi-Expansion** works with Ceramco, Creation, SynSpar, and other porcelains with similar thermal expansion.*

V-Tec Technique

Many different techniques exist for making a refractory model. Whatever technique you decide to use, make sure that the following is achieved. Degas the model or dies in a clean porcelain or burnout furnace. The final temperature should be 1825° F / 1000° C, with a hold time of 2 – 5 minutes. No vacuum is necessary.

If pouring the refractory directly into the doctor's impression, make sure to pour the die stone model first.

If duplicating, die spacer should be applied and the margins should be ditched prior to duplicating.

The liquid/powder ratio for V-Tec is **1.9cc liquid to 10 grams of powder.**

Always weigh the powder on a scale or measure it with the blue scoop. The scoop is marked on the bottom with "29.6cc". A level scoop will hold about 30 grams, therefore use **5.7cc of liquid per 1 scoop of powder.** For inlays, or where less setting expansion is desired, water can be used to dilute the refractory liquid. The suggested starting point is 80% liquid / 20% water.

The impression should be sprayed with a surfactant like Wax-Wet to minimize bubbles. Make sure the impression is blown dry before pouring the model.



The model is ready to duplicate



Silfact will prevent the duplicating material from sticking

After adding the liquid to the powder (or visa-versa), quickly incorporate the two together by hand spatulation. Mix on a mechanical vacuum mixer for 10-20 seconds. Keep in mind that the refractory sets very quick, so avoid over mixing. Temperature also affects the working time. If the material is mixed in a hot environment it will set unusually fast.



A medium bodied impression material is used to duplicate.

If the impression is not boxed, pour the refractory up to the sides of the impression, then wait for it to begin thickening. It can then be layered on the impression.



Use this scoop (5.2cc liquid per 1 scoop of powder).

Let the model set for 15-60 minutes after pouring. If pouring directly into the doctor's impression it is critical to let the model dry for 30 minutes or more. The drier the model is, the harder it will be. Placing the refractory/ impression in a warm area or under a heat lamp after it sets up will speed the drying process. Avoid leaving the refractory in the impression or mold for more than two hours. Refractory will bond to silicone impressions after a period of time.



Before the initial set the refractory will thicken allowing it to be stacked.

Degassing the model can be done two different ways. One method is to bring it all of the way up to the final degassing temperature (1825° F/1000°

C) in the burnout furnace. The other, and more preferable way, is to use a two stage process. Degas the entire model by bringing it up to a temperature of 1200° F/650° C in the burnout furnace and hold for about 15 minutes. After removing from the oven, let cool, then segment the model using a thin diamond disk or stripper disk.



Trim the refractory prior to basing.

Several methods can be used for basing and pinning the refractory model. Some technicians use just R.D. Pins along with index marks cut into the refractory. Others use the R.D. Pin, along with a ceramic pin for optimum stability.



After the pins are glued with the Z-20 Spacer, a small amount of wax is added to prevent sticking to the base.

After trimming the model to the desired shape, drill holes in the refractory where pins are needed. If using ceramic pins, Z-20 Spacer can be used to glue the pins in the hole. Before basing the model, apply a thin coat of petroleum jelly to the refractory as a separator. Applying a small amount of wax at the pin/model interface will also help in separating the base from the model. *Please note that if the refractory is too soft, then drill and trim the model before degassing.*



After removing the model from the base, it is segmented using a diamond disk.

Mark the margins and apply Z-20 spacer if needed. The die should be soaked in distilled water, then blotted with a tissue to remove excess water. Mix approximately 5

drops of Z-20 Spacer liquid per 1 white scoop of Z-20 spacer powder and apply to the die with a brush. Let the dies dry for about 5 minutes before firing.

Transfer the dies that are to receive porcelain to the porcelain oven for the final degassing. **The final temperature is 1825° F/ 1000° C with a hold time of 2-5 minutes and no vacuum.** If your porcelain fires above this temperature, then degass to about 25° F/ 14° C above the firing temperature of the porcelain.

Soak the dies in clean, distilled water and be sure to change the water every day.

Apply a thin layer of porcelain as the first coat to minimize shrinking and tearing.

Dry the dies on a hotplate before firing. They should be dried until no more steam can be seen leaving the die.

Proceed with the normal buildup, firing contouring, and glazing of porcelain.

Divest the restoration by first removing the bulk of the refractory with a diamond bur, then blast out the remainder using glass beads or aluminum oxide. Use a low pressure of



The margin is marked prior to final degassing. The pencil is dipped in water to provide easier marking.



The crown is ready for glazing.



The bulk of the refractory is removed using a diamond.

about 25-35 psi.

Fit the restoration to the master model and make any necessary adjustments. Transfer the restoration to the solid model for a final check of the fit.

Etch the restoration with Ceram-Etch for 8 minutes, rinse with water, then clean with distilled water in an ultrasonic cleaner.



Check the fit on the solid model.

Troubleshooting

Cracked Porcelain	<ol style="list-style-type: none">1. incorrect cooling time2. refractory and porcelain not compatible3. prep design/ thick and thin areas	<ol style="list-style-type: none">1. cool for 1 minute then remove from platform2. use the proper refractory for your porcelain3. pretend the crack is not there, then, before glazing grind out most of the refractory and the crack should heal
Lifting Porcelain	<ol style="list-style-type: none">1. heat rate is set too high2. refractory and porcelain not compatible3. contamination from impression	<ol style="list-style-type: none">1. use a heat rate of about 85°F/ minute2. use the proper refractory for your porcelain3. clean impression and do not apply anything before pouring
Gassing	<ol style="list-style-type: none">1. contamination from burnout or porcelain oven, grinding stones, or contamination from impression2. improper degassing	<ol style="list-style-type: none">1. find and eliminate the source of contamination2. degass above the porcelain's firing temp.
Tears and Fissures	<ol style="list-style-type: none">1. improperly dried die	<ol style="list-style-type: none">1. dry the die on a hot plate or similar

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