

DENTAL INVESTMENT BEST PRACTICES

TECH TIPS



Liquid Preparation/Dilution

Depending upon the investment being used, there may be multiple liquids that must be combined. Ensure that dilution ratios are followed correctly. When some multiple part liquids are mixed together, they have limited shelf life and should not be used beyond the recommendations. Failure to properly prepare/dilute the liquids can result in weak molds, casting defects, too large/small castings, and casting failures.

Liquid/Powder Ratio

It is important to weigh out and measure the prescribed amount of liquid and powder. Too much liquid will cause a weak batch that can crack during burnout of casting. Too much liquid also means there is more liquid that needs to be removed from the mold during burnout. Failure to adequately remove moisture will result in mold cracks and blowouts. If not enough liquid is added, the mix may set prematurely, and during vibration the particles in the mix may not create a smooth surface against the pattern and could result in a rough casting.

Working Time

The working time is the time in which the mixed investment should be painted, invested, and vibrated into a mold. It is important to note that the working time includes the time for vibration where the fine particles migrate to the face of the pattern before the investment sets, thus providing a smooth surface to cast against. If multiple flasks are being invested from one large mix, it is important that ALL flasks be filled and vibrated or else those invested near the end of the run could have a rougher cast surface due to too short of vibration time. Working time should not be extended by adding more liquid (see Liquid/Powder Ratio above).

Bench Setting

After the refractory model and ring are invested, there is an exothermic (gives off heat) reaction that takes place to develop the mold green strength. The invested flask needs to set undisturbed for a certain period of time (typically 30 minutes) after it is invested to develop the maximum green strength before further processing. If the bench set time is too short, the mold may not develop enough green strength and could be weak going into the burnout oven.

Grinding the Tops of the Ring

After the bench set and before the burnout, the tops of each ring will have a glossy, smooth surface. Moisture and gases in the mold will try to escape the mold during burnout. It is recommended to grind the top $\frac{3}{8}$ to $\frac{1}{2}$ inch of the mold top to expose a porous surface through which gases and moisture can escape more easily. Note that a minimum of $\frac{1}{2}$ inch of investment should cover the highest point of the pattern to the top of the surface after grinding.

Burnout

The burnout cycle listed on the directions for use is a good guideline; however, it may be necessary to deviate from these based on the process, product, and equipment. For example, deviations should be considered if oven loads are high or if a finer investment is being used. In these cases, it is suggested that the oven ramp rate be decreased and a one hour hold be added at intermediate temperatures (500°F and 1000°F) to allow all of the molds to achieve uniform temperature and reduce stress on the mold.



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