

JDT

Published by the:
National Association of Dental Laboratories

August/September 2017

Special Reprint

www.nadl.org/jdt

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What's **Still Hot** and What's Not?

Ceravety

– A novel speed-investment material for all indications

Despite multiple advancements in CAD/CAM technologies, pressing and casting remain an important part in the production process of indirect restorations. When it comes to applications, pressable ceramics, specifically lithium disilicate, have become the material of choice for many dental laboratory technicians and clinicians, successfully replacing gold and other metals and alloys. Dental investment materials are essential in the fabrication of precision dental casting and pressing. Industrial practices suggest that the correct selection of an investment material may reduce the fabrication cost by nearly 20 percent. With a plethora of different materials to choose from, discerning dental laboratory technicians tend to look for solutions that are faster, more economical, and proven to deliver predictable and consistent results.



“As a Master Dental Technician dedicated to producing only high-quality restorations, I always look for materials that help me add that special ‘master’s touch’ to all my cases. Every procedure is vital in accomplishing my goals.”

—Abel A. Fernandez, CDT, MDT, Owner of Master’s Touch Dental Laboratory in San Marcos, California

Speed Investments

The development of speed investments, materials based on the rapid burnout technique, has significantly streamlined the traditional laboratory workflow. Conventional investments require a lengthy pre-heating and production times, limiting a laboratory’s daily production. Speed investments shorten the total production time to fewer than 3 hours, facilitating a production-driven environment.

Ceravety

A next generation of a phosphate-bonded investment material, Ceravety has set new standards in investment technology (Fig. 1). This fine-grain, all-purpose material can be used for a variety of analog and digital wax patterns, ranging from pressing ceramics to casting alloys in both—ring and ringless techniques, using either the traditional- or quick burnout method, delivering a high degree of accuracy in combination with optimal burnout properties which leave no residue. Furthermore, when pressing high strength ceramics such as lithium disilicate, Ceravety does not require surface treatment to release the

tension, therefore eliminating the need for a debubbler.

Application

Like other phosphate-bonded investments, Ceravety consists of two components, a powder mixture and an expansion liquid. In order to achieve predictable and accurate casting, the correct powder-to-liquid ratio should be used. The use of a proper tool for measuring the liquid is recommended. It is also suggested that only distilled water is used to dilute the investment liquid.

During the fabrication process, investments undergo two types of expansion, setting expansion and thermal expansion. The expansion rate of Ceravety can be adjusted by altering the ratio of an expansion liquid to water. A less-diluted investment liquid yields a higher setting expansion and larger casting—a scenario that is suitable for casting with metal rings. The required concentration of the expansion liquid depends on factors such as the type of an indirect restoration (alloy, ceramics), application (crown, bridge), required fit and selection of a pattern material.

In order to obtain a complete chemical reaction between the powder and liquid, it is important to mix the components into a homogenous consistency, firstly by pre-mixing the powder and liquid by hand with a spatula then by mixing it under a vacuum mixer (Fig. 2). Inadequate mixing can produce an inconsistent fit, casting bubbles, and result in a rough casting surface.

Figure 1 (Left)

Shofu’s Ceravety Press & Cast sets new standards in investment technology. This universal material can be used for digital and analog indications, in either the speed pressing and casting method or the conventional overnight heating technique.





Figure 2 (left)

Dimensionally accurate wax patterns are the foundation of efficient pressing and casting. Ceravety offers a fluid, bubble-free consistency that allows for accurate reproduction of finest details.



Figure 3 (right)

The results of casting with Ceravety are depicted by higher surface quality and excellent detail reproduction at the margins.

Investing

The working and pouring time for Ceravety is 6 minutes. The optimal setting time prior to the insertion to a furnace is 20 minutes. In that time, the moisture retained within the investment material induces the production of steam which creates even heating of the mold and facilitates the elimination of wax residue. Also, prior to introducing the investment into a furnace it is essential that the investment be fully set. An unset material will produce casting defects such as distortions and rough surface. For optimal results, the investment material at the top of the investment ring should be roughened to allow for an easier escape of gases during the burnout and casting procedures.



Figure 4 (above)

Newer furnaces are designed to minimize ceramic press time while still ensuring perfect pressing. This feature facilitates even temperature distribution inside the ingot and helps improve the quality of pressed structures.

Ideal for all digital and analog wax patterns, including traditional casting of metal substructures of any alloy from non-precious to high noble, pressed porcelain and ceramic restorations, Ceravety can be successfully fabricated under either the speed- or conventional-heating technique (Fig. 3). When pressing lithium disilicate, a furnace with optimized firing programs should be selected. Unlike other pressable ceramics, lithium disilicate tends to absorb small amounts of the investment material, creating a contacting surface that can contaminate the final restoration. This reaction layer must be cleaned prior to veneering, shading or glazing. Newer furnaces are equipped with an automatic press time function which can sense the

complete filling of the mold and therefore facilitate an easy removal of the reaction layer (Fig. 4).

Composed of 40% of quartz and 30% of cristobalite fillers with a proprietary matrix binder, Ceravety possesses a formulation with optimized thermal conductivity which, specifically, helps release stress in pressed ceramics resulting in clean, smooth, and precise fit. Furthermore, this unique formula also prevents burning and inhibits the reaction layer. Additionally, the material can be easily divested with a minimum effort, eliminating the need for excessive force or harsh abrasion. Only a low-blasting pressure is needed which helps reduce the stress acting on pressed structures with thin walls and preserve the marginal integrity (Fig. 5).



Figure 5 (above)

The accuracy of fit achieved with Ceravety directly after divestment, without any adjustments (left) and after fine sandblasting (right).

Closing Comments

In summary, when optimally combined and coordinated with other components of the fabrication chain, the Ceravety investment sets new standards in reliability, efficiency and accuracy in pressing and casting processes. The material offers a very short setting time, optimal thermal conductivity, nearly no burning and no reaction layer, outstanding detail reproduction, quick divestment at a low blasting pressure, and it is available in a generous 100-gram package, giving laboratory technicians a full control over pressing and casting processes. ■

www.shofu.com

CERAVETY PRESS & CAST

UNIVERSAL INVESTMENT FOR PRESSABLE CERAMICS & CAST ALLOYS

- Works with all alloys and pressable ceramics
- Provides a long working time; use ring or ringless techniques with confidence
- Has a quick or overnight burnout technique for full control of casting
- Ensures effortless removal and reduces possibility of chipping of ceramic
- Has less burning (reaction layer) of pressable ceramics and investment materials
- Increases precision of the fit, resulting in a time saving predictable result

"In the 'Age of Digital', Ceravety investment is able to make the crossover. Digital wax patterns are ready to be invested 'Thru the Barrier' into the 'Digital World', giving you optimal results."

-Abel A. Fernandez, CDT, MDT



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