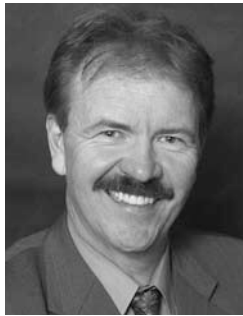


# Pressed Ceramics Versus Layered Feldspathic Veneers: A Rationale for Modality Selection



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One of the hottest topics in the dental industry is the debate about which is better for indirect veneer restorations: pressable ceramics or multi-layered powder-liquid feldspathic porcelain. Both of these techniques have advantages and disadvantages.

In most esthetic-conscious dental laboratories, the decision about which modality will be used to restore a case is made after a conversation between the doctor and technician. This step is critical to the success of the case and assurance of patient satisfaction. But what happens when this decision is left entirely up to the laboratory technician? What would you, the laboratory technician, recommend to the restoring dentist? Would you choose the system with which you are the most comfortable and have the most experience? Of course you would. But what if you have a high level of experience with both systems?

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*The success of any case, regardless of the system used, is based on proper preoperative communication between the dentist and the technician.*

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## GUIDELINES

The following guidelines are suggestions based on what has worked well for me. They are subjective—there is no right or wrong answer.

I would choose pressed ceramics when

- increasing incisal length more than 2–3 mm
- closing diastemas greater than 2–3 mm
- restoring severe wear cases or full-mouth reconstruction cases, due to the fact that pressed ceramics are inherently stronger and more durable<sup>1</sup>
- combining veneers with full coverage restorations.



*Figure 1: Patient, before.*



*Figure 2: Preoperative model showing wear.*

I would choose layered feldspathic veneers when

- restoring tetracycline-banded discolored preparations, because layered porcelain powders provide more flexibility with respect to choice of opacity and translucent areas<sup>2</sup>
- doing conservative cases (e.g., younger people with large pulps), because less tooth structure needs to be removed.

These guidelines may be oversimplified. Again, they are subjective and should be considered secondary to the most important quality, experience. The success of any case, regardless of the system used, is based on proper preoperative communication between the dentist and the technician.

There are essentially two different methods available when fabricating multi-layered powder-liquid feldspathic all-porcelain restorations: the “old dog” platinum foiled system and the more contemporary refractory die system. I favor the foil

technique due to many years of favorable results.

### CASE STUDY

The following describes a case utilizing multi-layered powder-liquid build-ups on platinum foil matrices.

The patient was a 26-year-old dental student at New York University, who felt that the accelerated wear on her four anterior incisors needed to be addressed (Fig 1). After initial discussion with the restoring dentist, we received study models and pictures prior to any preparations or final diagnosis. The immediate question was, “What has caused the accelerated wear on this young woman?” The answer: occlusal interferences.<sup>3</sup>

The case was diagnosed with an open bite tray registration technique and mounted on a semi-adjustable articulator (Panadent Corp.; Grand Terrace, CA) on the hinge axis, which detected a centric relation/centric occlusion (CR/CO) discrepancy (Fig 2). An occlusal appliance known

as a maxillary anterior guided orthotic (MAGO) was constructed.<sup>4</sup> The patient was compliant and wore the MAGO long enough to facilitate an occlusal coronoplasty (equilibration) of her interferences, which turned out to originate from the posterior region of her mouth.

We received new models after equilibration and again diagnosed using instrumentation to ensure that CR = CO (Fig 3). Using smile guides to demonstrate different incisal characteristics, the patient’s preferences were documented and transferred to the mounted study models in wax.

After verifying that the wax-up provided the desired anterior guidance, the wax-up was duplicated in stone to facilitate fabrication of a custom provisional matrix (Fig 4).

Traditional vacuum-formed stents are subject to the following problems: the relatively thin 0.3–.5-mm stent material works well to capture intimate detail, but fails to provide proper intraoral orientation (Fig 5). As a result, the provisionals are almost always distorted. The thicker,



*Figure 3: CR=CO adjusted models with anterior wax-up.*



*Figure 4: Duplicated models of wax-up.*



*Figure 5: Double-laminated stent formed over wax-up model.*



*Figure 6: An accurate 0.3-mm stent on left and a rigid 1.5-mm stent on the right.*



*Figure 7: Minimal reduction preparation for layered feldspathic veneers.*



*Figure 8: Stent placed in mouth ready for provisionalization.*



Figure 9: Provisionals made from the stent.



Figure 10: Silicone index made from a model of the accepted provisionals.

more robust 1–1.5-mm material provides a more stable intraoral orientation, but unlike the thinner material, does not capture intimate detail. As a result, the accuracy of the provisionals is less than desired.

In this case, the solution to the problem was to create a combination of both materials (Fig 6). However, this technique proved to be inefficient with traditional vacuum-forming machines. What is needed to fabricate this type of stent is positive pressure and properly heated materials. The unit we found to be successful was the Biostar® (Great Lakes Orthodontics; Tonawanda, NY) pressure molding machine.

The Biostar temporary stent serves many different functions:

- The dentist can use it to make provisionals that represent the wax-up. The material is durable enough for multiple applications if needed.
- The stent can be used as an intraoral reduction guide because it is transparent.
- The dentist can fill it with composite to generate intraoral

mock-ups that allow the patient to see what he or she will look like with increased incisal length and facial contour if desired.

- It can be used as a preliminary bleaching tray.

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***The importance of careful seating and contouring of the provisionals according to the patient's expectations cannot be emphasized enough.***

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The patient's dentist and I discussed the possibility of using minimally invasive multi-layered powder-liquid feldspathic porcelain veneers. The decision was based on the fulfillment of the previously mentioned criteria: lengthening of no more than 2 mm, no noticeable discoloration of preparations, and a young patient (Fig 7).

After preparation of the six maxillary anterior teeth, we used the Biostar stent to make the provisionals. At this time it is possible to add or subtract to the temporaries according to patient preferences (Fig 8). I

believe that this is by far the most critical step in the success of the final product; this is the patient's chance to express personal wishes with respect to shape and arrangement of the final restorations.

The importance of careful seating and contouring of the provisionals according to the patient's expectations cannot be emphasized enough. If the patient is not happy with the form of the provisionals it will be very hard for the technician to "guess" the desired shape and contour that will please the patient (Fig 9).

Once the patient has accepted the shape and contour of the provisionals, an impression is taken and poured in stone. This study model of the provisionals can now be mounted against the opposing teeth and a silicone putty index can be formed to the incisal edges as well as the labial contours. This index aids the technician in the planning and build-up of the final porcelain restorations (Fig 10).

The models were pinned and mounted on a semi-adjustable articulator and the individual dies





*Figure 11: Incisal imprint of study model provides guide for the ceramist.*



*Figure 12: Platinum foil adapted to the dies ready for porcelain layering.*



*Figure 13: Translucent gingival porcelain as first layer.*



*Figure 14: A diluted dentin powder was used for body porcelain.*



*Figure 15: The second layer produced a light translucent body.*



*Figure 16: Multiple enamel overlays of translucents.*



*Figure 17: Final enamel firing.*



*Figure 18: The foil technique can provide excellent fit.*

were foiled with .001-in. (.025-mm) platinum foil (Williams, Ivoclar Vivadent; Amherst, NY) (Fig 11). An “old-fashioned” swager ensured an intimate fit to the stone dies. The proximal excess foil was trimmed to make sure the dies would fit into the base of the model (Fig 12).

We decided to utilize the “contact lens” effect at the gingival to create an illusion of a “disappearing” margin (Fig 13). A half-and-half combination of A1 dentin powder and clear incisal porcelain was mixed and layered at the gingival. The interproximal was cut using a thin blade and the porcelain was fired. This layer of gingival porcelain acts as a stable matrix for the future layers.

The second layer needed a lighter shade than A1, but I have found that the so-called bleached shades are too opacous and blotchy when used in thin areas (Fig 14). A half-and-half mixture of A1 and enamel white was used to create the desired effect on the body of the restorations. Undiluted A1 was used for the canines.

The second layer produced a light translucent matrix for the enamels and internal coloring (Fig 15). A1 opacous dentin was used for the dentinal lobes. The length and angulations were assessed at this time and corrections done accordingly.

Enamel and translucent overlays are the keys to beautiful and natural restorations (Fig 16). The balance between too much and not enough is a fine line. There is no specific formula for the amount of enamel overlay, but it is up to the technician to study the pictures provided by the dentist or, if possible, the patient in person. This patient’s natural enamel had numerous colors and many levels of translucency. As a rule of thumb when studying enamels, I always say “the more the merrier.” I typically use a combination of blue, yellow, white, opal, clear, and super-clear.

One of the many advantages of the all-ceramic restorations is that multiple firings will not “gray out” the porcelain (Fig 17). With all-ceramic restorations there is no gray oxide migration from the metal; it

is possible to add multiple layers of translucent and opalescent until the desired form and color have been obtained. The silicone index made from the study model of the accepted provisionals is invaluable at this time to ensure proper incisal edge contour.

The foil technique can provide a very good fit if proper care in adapting the foil and removing it is exercised. As with any sensitive techniques, there is a learning curve involved (Fig 18).

One of the most important steps in ensuring the fit of porcelain veneers (or any restoration made in the dental laboratory) is to carefully seat every unit on a solid model that has been trimmed around the margins (Fig 19).

Seating porcelain veneers with a translucent medium allows the natural tooth color to blend naturally with the color of the thin porcelain (Fig 20). This concept is similar to the way Mother Nature uses enamel as the prism to display the colors of the dentin. The thinness of the veneers permits the dentist to use a



Figure 19: Final veneers fitted to solid model.



Figure 20: Seated veneers showing high level of translucency.



Figure 21: Close-up shows the blending "contact lens" effect.



Figure 22: The smile says it all.

light-cure as well as a dual-cure resin to bond the restorations (Fig 21).

## SUMMARY

The many all-ceramic systems available to dentists and dental technicians today offer choices like never before. The conservative multi-layered powder-liquid feldspathic porcelain on platinum foil technique is not for every case, but it certainly should be considered in

cases similar to the one described here (Fig 22).

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