Integrity Multi-Cure, a unique dual-cure composite provisional resin

**Author** Howard Strassler, DMD, FAGD, FADM

---

-Fixed prosthodontic restorations are multiple-step, multiple-visit precision restorations. As part of the initial treatment after tooth preparation, a temporary (provisional) crown or fixed partial denture must be fabricated to protect the tooth preparation while the definitive restoration is being fabricated by the laboratory. No matter which material or technique is used, these temporary restorations play a key role in the success of the final restoration.

During tooth preparation and soft-tissue management for impressions, the gingival tissues are sometimes traumatized. A well-fabricated resin provisional restoration aids in the healing of the soft tissues. Once fabricated, the provisional restoration can be evaluated for thickness and contours, and can be used by the clinician to verify that there is adequate clearance and reduction of the tooth preparation for the final restoration.

Once cemented, provisional restorations for vital teeth provide pulp protection to the tooth between treatment appointments. In the case of anterior restorations, temporary restorations provide for an esthetic trial for the evaluation of color, contours, length, widths and shapes of the teeth before fabrication of the final porcelain-metal or porcelain restoration. In more extensive cases, they help determine the desired occlusal relationships.

When teeth are prepared, the tooth preparation no longer has an occlusal stop or proximal contact. Without the provisional restoration, teeth can shift and change position. The provisional restoration plays an important role in positional stability, holding the position of the prepared tooth both occlusally and proximally.

If the tooth or teeth that have been prepared shift after the impression is made, the restoration returned by the laboratory will very likely need more adjustment before cementation. Adjustments of the definitive restoration will increase chairtime needed during the cementation appointment. This can become a significant cost of inefficiency in a dental practice.

In some cases, the restoration may no longer be able to be seated because of a change in the path of insertion for a single crown. For a multiple-unit fixed

---

**Fig. 1**. Matrix impression can be made using Regisil Rigid or Algin-X Ultra impression material. (Photos/Provided by Dr. Howard Strassler)

**Fig. 2**. The Integrity Multi-Cure is dispensed with the auto-mixing tip directly into the matrix. The matrix should be inserted into the mouth within 45 seconds.
Algin•X™ Ultra
Alginate Alternative

Convenience mixed right in

Pour when you want. Repour when you need.

VPS-based Algin•X™ Ultra Alginate Alternative allows you to pour your model whenever you want, and repour if necessary, for up to two weeks. And its automix cartridge provides a consistent mix. As the alginate alternative from the makers of Jeltrate®, the #1 alginate, Algin•X™ Ultra Alginate Alternative is the option you can rely on for diagnostic impressions.

For more information contact DENTSPLY Caulk at 1.800.LD.CAULK or visit www.caulk.com.
When teeth have moved because of loss of the provisional restoration, the practitioner might have to fabricate acrylic resin copings and make a pick-up impression so that the laboratory can fabricate a final restoration to the new tooth preparation positions.

In some cases, because of tooth movement, the tooth preparation might need to be orthodontically repositioned or the teeth re-prepared. This leads to a significant increase in chairtime and may lead to patient dissatisfaction because of the additional procedures and office visits. For a tooth that has shifted only a minor amount, the outcome may only be an increase in chairtime during the cementation appointment.

As a clinician, the fabrication of temporary restorations requires the mastery of a variety of materials and techniques that can be used to make well-adapted and functional provisionals for crowns, fixed partial dentures, inlays or onlays. In the past, most temporary restorations were fabricated using acrylic resins, usually mixing a powder and liquid together to form a paste that was then placed in a template or carrier to be placed over the tooth preparation. When the acrylic resin reached an almost set stage, the carrier would be removed so that the resin could reach complete polymerization and hardening. These materials are difficult to proportion for mixing and provide challenges in the timing of their removal from the mouth.

When the acrylic resin reached an almost set stage, the carrier would be removed so that the resin could reach complete polymerization and hardening. These materials are difficult to proportion for mixing and provide challenges in the timing of their removal from the mouth.

Although these materials are tooth colored and relatively inexpensive, they are difficult to manipulate and have poor physical properties. Powder-liquid acrylic resins are typically methylmethacrylates. These materials are sloppy to use, shrink on polymerization, generate significant heat during polymerization and have an unpleasant odor while setting. These resins wear in occlusal function, are susceptible to breakage because of low strength values and can discolor over time.

To overcome the deficiencies of acrylic resin, a new class of provisional restorative materials, bis-acrylic composite resins were introduced. The majority of bis-acryl composites, such as Integrity (DENTSPLY Caulk), are auto-mixing and self-setting. Integrity has the properties desired for a fixed prosthodontic provisional resin.

Time is money in dental practices. With this in mind, a new addition to the Integrity family of provisional composite resins, Integrity Multi-Cure, was introduced that cuts the time required to fabricate a provisional crown or bridge by 30 percent.

Integrity Multi-Cure uses the well-proven chemistry of dual-cured composites building on the formulation of FluoroCore 2 Plus. Unlike traditional bis-acrylic composites that need to bench cure, Integrity Multi-Cure can be light cured in a matter of seconds. Once the temporary crown is removed from the mouth, a 10-second light cure takes the composite from an elastic phase for easy removal from the tooth preparation and mouth to a fully set temporary restoration with excellent physical properties.

Integrity Multi-Cure has minimal shrinkage, which translates into an excellent fit with minimal adjustment before cementation. For durability, Integrity Multi-Cure is wear resistant and has an improved flexural strength.

Integrity Multi-cure provides the following advantages:

- Highly esthetic with translucency and added fluorescence.
- Dual-cure for fast curing with the light cure option, but does not have to be light cured.
- Excellent durability with superior physical properties, wear resistance and flexural strength.
Technique

After setting, the restoration can be removed from the matrix and finished and polished.

For cementation, place a thin, uniform layer of thin film temporary cement (Integrity TempGrip) to the entire surface of the temporary and seat on a clean, dry tooth preparation. Clean up of excess can be done 90 seconds after cementation.

• It is quick and easy to use; allowed to have a preliminary set in the mouth of 75–90 seconds; removed and then immediately light cured so it can be adjusted right away.
  • Trims with burs, diamonds and disks.
  • Has extremely low polymerization shrinkage and minimal heat of polymerization.
  • Does not adhere to teeth.
  • Is radiopaque.
  • Can be easily repaired with a light-cured flowable composite resin.
  • Excellent color stability and stain resistance and is available in five shades (A1, A2, A3.5, B1, BW).
  • Has little odor when mixed.
  • Highly polishable to a natural luster.

Technique tips

I prefer to use either a disposable quadrant tray or bite impression tray to fabricate the matrix carrier for Integrity Multi-Cure before starting the tooth preparation. The temporary is a duplicate of the original unrepaired crown. If the tooth being prepared has a fractured cusp, a composite resin can be placed and light cured to restore the contour where the tooth structure was lost before taking an impression to fabricate the matrix carrier.

A matrix impression can be made using Regisil Rigid or Algin-X Ultra impression material. After removing the matrix from the mouth, put it aside and prepare the tooth (teeth) that is to be restored. After tooth preparation, dispense the Integrity Multi-Cure into the matrix for the tooth being temporized. Place the auto-mixing tip so it touches the occlusal surface or incisal edge of the impression and fill from the inside out. This will help prevent any voids in the temporary.

Place the carrier with Integrity Multi-Cure into the mouth and allow it to initiate setting for 75–90 seconds. Remove the carrier from the mouth. For faster setting and time savings, place the curing light tip as close to the temporary as possible and light cure for a minimum of 10 seconds. Integrity Multi-Cure cures with blue wavelength light (~460 nm). If not light curing, Integrity Multi-Cure will set in five minutes from the initial start of the mix being placed in the carrier.

The provisional restoration can be adjusted and trimmed with diamonds, disks and acrylic burs. In my experience with Integrity MultiCure, there is usually no need for additional adjustment of occlusion or proximal contact.

This is not unusual because of the reproducibility of the technique described. Final polish of the restoration is done using an Enhance alumina-containing composite finisher followed by a Pogo diamond-impregnated polishing point.

Cementation of the provisional restoration

Not all temporary cements handle the same. For temporary cement selection, it is desirable to have an auto-mixing syringe to provide for reliable mixing of the cement so the cement has a creamy consistency that remains where it is placed. To ensure easy and complete seating of the temporary crown, the cement should have a low film thickness.

Also, it is important to have a temporary cement that does not fall apart when set to allow for easy cleanup. Crumbled temporary cement can lead to gingival inflammation and bleeding. Eugenol-free Integrity TempGrip provides all the desired features of an excellent and reliable temporary cement.

To facilitate the removal of excess temporary cement once seated, the polished surfaces of the Integrity Multi-Cure provisional restoration are lightly painted using a disposable brush with a petrolatum
It is important that the petrolatum is not painted on the internal surfaces of the crown. Using the auto-mixing tip with the cement, a small amount is directly extruded into the temporary crown. Only a slight amount of temporary cement needs to be used because the provisional crown is well adapted.

**Conclusion**

This article describes a technique using Integrity Multi-Cure, a dual-cured bis-acrylic composite resin provisional crown and bridge material. With the technique described, a clinician can reduce chairtime by almost 30 minutes over the use of self-cure acrylic resins for temporary crowns and bridges.

Integrity Multi-Cure has the flexibility to be used for fast setting with a curing light or allowed to bench set. This material provides a high-strength, well-adapted, polished temporary that is more wear resistant than conventional acrylic resins.

**References**


**About the Author**

Howard E. Strassler, DMD, FAGD, FAADM, is professor and director of operative dentistry in the Department of Endodontics, Prosthodontics and Operative Dentistry at the University of Maryland School of Dentistry. Strassler has been teaching more than 30 years to students and dental residents and practitioners as an invited speaker in continuing education programs and has been a pioneer and innovator with dental adhesives and esthetic restorative materials, bonding of porcelain veneers, fiber reinforcement materials and other techniques that have become mainstream in the current practices of dentistry. He is a consultant to more than 15 dental manufacturers and serves on advisory boards. He is on several editorial boards and reviews articles for many journals. He has authored more than 475 articles and seven chapters in texts. Strassler received the Academy of General Dentistry’s highest award, the Thaddeus Weclew Fellowship, in 2000. He has also been listed among the top 100 speakers in C.E. He has presented on most of the major dental programs throughout the United States, Europe, Mexico and Canada. You may contact him at:

Department of Endodontics, Prosthodontics and Operative Dentistry
University of Maryland Dental School
650 West Baltimore St.
Baltimore, Md. 21201
(410) 706-7047
hstrassler@umaryland.edu