

# TECHNICAL PROFILE

AN INSIDE LOOK FROM THE MANUFACTURER

## Efficient Laser Assisted Cavity Preparations: Minimally Invasive Dentistry Done Right

*Lasers allow* for the removal of tooth structure and bone. The authors have found several advantages to using Erbium lasers, including no anesthetic procedures, reduction in postoperative sensitivity, and clinically better-looking adhesive restorations. However, for the majority of non-laser owners and even a significant portion of laser owners, a major concern of laser-assisted cavity preparations is the “slowness” of lasers cutting into tooth. Under magnification, lasers cut tooth structure efficiently; however, laser cavity preparations continue to pose challenges to users and preclude dentists from incorporating a hard tissue cutting laser into their practice because of the shallow penetration depth, the narrowness of fiber tips and the end-cutting nature of the laser light.

Drs. Howard Golan and Mike Koceja, in conjunction with KOMET USA, have compiled the Laser Assisted Dentistry Prep

Kit LD0044 (Figure 1) to aid the clinician in efficiently removing carious and decalcified tooth structure while maintaining the benefits of laser-assisted preparations to combat the efficiency issue. The kit increases a dentist's efficiency during non-anesthetic dentistry, maintains minimally invasive preparation, and removes tooth structure.

The difficulty in laser-cavity preparations is the lateral extension of Class I and II preparations. Typically, because of their familiarity with rotary instruments, clinicians will attack laser preparations by getting to the caries as fast as possible; however, this leaves a narrow occlusal pit or deep and narrow proximal box. This poses a dilemma for dentists when they are ready to extend and clean the dentin-enamel junction, and find it hard if not impossible to accomplish this because of the enamel's thickness, the position of the enamel rods and the laser's end-cutting nature.

In addition, though adhesive dentistry has significantly improved, mechanical retention is still indicated to retain restorations. Lasers can help in this nature but the right bur or bur kit allows for quick and simple retention to any preparation. With the minimally invasive nature of the laser cavity design, rotary instruments that are small enough to enter these preparations provide the retention that is needed. The Laser Assisted Dentistry Prep Kit provides shapes to provide simple and minimally invasive undercuts and mechanical retention that the clinician needs and desires.



Figure 1 Laser Assisted Dentistry Prep Kit.



Figure 2 A preoperative image.



Figure 3 Initial cavity outline form with ErCr:YSGG laser.



Figure 5 Completed proximal box.



Figure 7 Completed cavity preparation.

One of the instruments included in the kit is a KOMET USA Micro Prep Instrument 953M.314.014, which is ideal for the restoration and excavation of undermining carious lesions in the dentin. The bur helps to conserve as much healthy tooth structure as possible.

The included instruments are also best suited for treating fissure caries and for opening larger, deeply embedded defects. They are equally suited for more complicated preparations, such as the beveling of cavity margins in the proximal area. These instruments can remove decayed dentin quickly, resulting in smoother surfaces and minimal clogging.

### CLINICAL EXAMPLE

Tooth No. 29 provides a typical example of how the Laser Assisted Dentistry Prep Kit can be useful. A Class II cavity preparation will be created on the distal and occlusal surfaces with no injection (Figure 2). Initial penetration into the marginal ridge and early creation of a proximal box using a Waterlase® MD (Biolase Technology, Irvine, CA) laser was accomplished. Pulpal, buccal, and palatal extension as well as refinement of the preparation was needed during this procedure (Figure 3). A small pear-shaped bur (KOMET USA, 830.314.008) was used to complete the proximal box (Figure 4 and Figure 5). Oc-



Figure 4 A small pear-shaped (830.314.008) bur was used to complete the proximal box.



Figure 6 Additional mechanical retention was indicated because of the shallow nature of the occlusal portion. The undermining shape 953M Micro Prep Diamond was used to provide minimally invasive mechanical retention to maintain the restoration.



Figure 8 Completed restoration.

clusal portion of the preparation began with the Waterlase; however, addition mechanical retention was indicated because of the shallow nature of the occlusal portion (Figure 6). The undermining shape 953M (looks like a “flying saucer”) was used to provide minimally invasive mechanical retention to maintain the restoration, thus completing the restoration (Figure 7 and Figure 8).

### CONCLUSION

For those dentists who use a laser in their operatory, the Laser Assisted Dentistry Prep Kit can be useful and increases their efficiency during no-anesthetic dentistry. The Laser Assisted Dentistry Prep Kit is perfect for maintaining minimally invasive preparations.

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For more information contact:

KOMET USA, LLC  
Phone: 888-KOMET-USA  
Web site: [www.komet-usa.com](http://www.komet-usa.com)  
E-mail: [info@komet-usa.com](mailto:info@komet-usa.com)

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