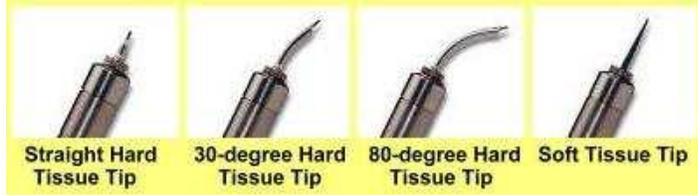


66-10 DELight Dental Laser System (Project 01-34) (8/02)

The DELight Laser System is an erbium:yttrium-aluminum-garnet (Er:YAG) laser marketed by Continuum Lasers for dental applications. The DELight emits a pulsed, 2.94-micron wavelength laser beam that is highly absorbed by water or water-containing tissues. The laser has been received FDA approval for dental hard and soft tissue applications. It is purported to be able to perform cavity preparations of all classes and to remove existing resin composite restorations. This laser system, however, is not intended to remove amalgam restorations.



Because the wavelength of the Er:YAG laser is highly absorbed by water-containing tissues, its ablation rate and efficiency are dependent on the target tissue's water content. The water content of enamel, dentin, and dentinal caries differ, so power levels required for ablation of each are respectively different. Enamel, with the lowest water content, requires correspondingly more energy than dentin. Dentinal caries, which has the greatest water content of tooth tissues, requires less energy for ablation/removal than healthy dentin. Approximate energy settings for various hard tissue removal have been established by the manufacturer. Since the energy requirement for removing carious dentin is less than that required for healthy dentin, careful use of the DELight laser should theoretically remove only carious dentin. However, this has yet to be demonstrated by scientific studies.



The DELight Laser System has an energy output of up to 350 milli Joules, operates only in a pulsed mode, and has repetition rate settings of 3, 10, 20, 25, or 30 pulses per second. The 360-degree, swivelled handpiece features a pulsed, visible white

light for aiming. The laser can be configured for 115-volt current and either 50 or 60 Hz. The unit is 30" H x 10" W x 18" L, weighs 90 pounds, and is on a roller-based chassis.

Manufacturer:

Continuum Lasers
3150 Central Expressway
Santa Clara CA 95051
(800) 532-1064
(408) 727-3240
(408) 727-3550 FAX
www.continuumlasers.com

Suggested Retail Price:

\$44,500 DELight Dental Laser System (leasing options are also available); includes:

- DELight dental laser
- footswitch
- water input connector and tubing
- air input connector and tubing
- fiber optic cable
- 2 handpiece sleeves
- assortment of 10 treatment tips, (80, 30, straight, soft tissue)
- 90-degree handpiece for posterior occlusal preparations
- power cord
- 2 external water bottles
- operation manual
- clinical procedures guidelines
- 3 safety goggles (pediatric glasses also available)
- 2 keys for Interlocking Safety Switch
- laser safety sign

Government Cost:

\$39,900 DELight Dental Laser System (same items and leasing option as above)

ADVANTAGES:

- + Is FDA approved for soft- and hard-tissue applications.
- + Provides a conservative means for removing carious tooth structure.
- + Laser dentin preparation does not appear to produce a traditional smear layer, which has been shown to interfere with the performance of some adhesive products.
- + Energy settings are provided by the manufacturer for various clinical uses.
- + Owner's manual is complete and easy to understand.
- + Relatively easy to set up.
- + Has a moderate, but gradual, learning curve.
- + Meets electrical safety standards.
- + Initial training on laser use and safety is provided by the manufacturer.
- + Required laser safety signs and glasses are provided by the manufacturer.

DISADVANTAGES:

- Expensive.
- End-cutting nature of probe may not be as conservative for preparing tooth structure as using small carbide burs.
- Requires meticulous attention during cleaning and sterilization procedures.
- Does not totally replace the air-turbine handpiece.
- Requires ophthalmologic medical surveillance for USAF users.

SUMMARY AND CONCLUSIONS:

The DELight is an Er:YAG dental laser system that has FDA approval for both hard- and soft-tissue applications. DIS found that the unit was easy to assemble by following the manufacturer's instructions. The instructions for use were clear and complete, with helpful color photographs. During laboratory evaluation, the DELight met all electrical safety standards, and made preparations on smooth surfaces that were as conservative as those made by a 329 bur. For more involved preparations (i.e., where lateral removal of tooth structure is required) the laser was as conservative as using ½ and ¼ round fissure burs for the initial outline form. However, the laser's contact tips used during this evaluation were only end cutting and may not be as conservative as standard carbide burs for preparations that require lateral extension. Review of the literature suggests that Er:YAG laser treatment of dentin does not adversely affect the dentin's bond strength to common bonding agents. Drawbacks of this laser include its high cost and the need for meticulous attention to detail when cleaning and sterilizing the laser contact tips. The **DELight Dental Laser** is rated **Acceptable** for use by the federal dental services.