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Fusion 2007 Curing Light (DentLight Inc.) (Project #07-029) (3/09)



The Fusion 2007 Curing Light is a visible light curing unit based on the FUSION™ high power, LED light-beaming technology that is advertised to provide an intense and focused beam that minimizes light dispersion while providing 1500 mW/cm² irradiance. The Fusion 2007 is touted as providing an expedient, deep, and consistent cure that is said to be less than five seconds for a 2 mm thickness of shade A3 or lighter resin composite material and less than 20 seconds for some 8 mm thick core materials. The cordless unit is powered by a replaceable, lithium-ion battery that is said to provide up to 300 curing cycles (two time settings: nine and 20 seconds) that is fully recharged in 90 minutes. When battery power is low, the Fusion 2007 can be converted to a cord-powered operation mode. The Fusion 2007 Curing Light has a one-year warranty and is available either in a light gray or a custom (pink/blue/gold) finish. During this evaluation DentLight introduced the Fusion 2008, which features different upgrades over the Fusion 2007. As a result the Fusion 2007 is in the process of being withdrawn from the market.



Manufacturer:

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Suggested Retail Price:

\$599.00 Fusion 2007 LED Curing Light Kit (#7500080) contains:
- Fusion 2007 Curing Light Handpiece
- Charge Base
- Charge Base Stick Pad
- Power Adapter
- 25 Curing Cap/Light Shields
- 100 barrier sleeves
- Instruction Manual and Warranty

Government Price:

\$419.00 Fusion 2007 LED Curing Light Kit (item number and contents as listed above)

ADVANTAGES:

- + Degree of cure overall enhanced as compared to a typical halogen curing light
- + Most CQ-based resins can be adequately polymerized in 9 seconds
- + Competitively priced
- + High irradiance output: approximately 1100 mW/cm²
- + Long LED life compared with halogen bulbs
- + Long battery life with minimal loss of irradiance on a single charge
- + Provides good intraoral access
- + Two program settings
- + Ergonomically-placed controls
- + Lithium-ion rechargeable battery
- + Protective eye shield included

DISADVANTAGES:

- Manufacturer claim of three second cure of 2 mm thick shade A2 resin composite not validated
- Manufacturer claim of five second cure of 2 mm-thick shade A3 resin composite found to be material and polymerization condition specific
- Light collimation evaluated as a function of linear distance from light guide surface no better than other curing lights evaluated by DECS
- Does not initiate cure of all photoinitiators in times described by manufacturer
- Only one, integrated light guide
- Continuous use may cause buildup of internal heat and necessitate unit shutdown
- Use of curing cap can decrease curing efficiency

SUMMARY AND CONCLUSIONS:

The Fusion 2007 is a competitively-priced, quiet, lightweight, light-emitting diode (LED) curing light that is capable of providing continuous exposures for over four hours with minimal loss of irradiance on a single battery charge. Depth of cure was similar to popular halogen- and LED-based curing units. However, in spite of manufacturer claims, like most LED curing lights, it may not polymerize all dental materials—especially Lucrin TPO-based photoinitiators due to the limited width of its emission spectrum. Furthermore, the manufacturer-advertised claim of the Fusion 2007's ability to photopolymerize a 2 mm thickness of any shade A2 restorative resin in three seconds was not validated. Some A3 shade resin composites were found to be adequately cured using a curing cycle of five seconds; however this was found to be both material and polymerization condition specific. The Fusion 2007's unique optical focusing design was found to maintain irradiance over distance similar to other halogen and LED curing units evaluated by DECS. Clinical users appreciated the Fusion 2007's cordless design, quiet operation, and high-irradiance output. Evaluators reported that the Fusion was ergonomically designed and provided good intraoral access during restorative procedures. All of the clinical users rated the clinical performance of the unit above average, rating the Fusion 2007 as either "Excellent" or "Good". The **Fusion 2007** curing light is rated **Acceptable** for use in US Air Force dental facilities.