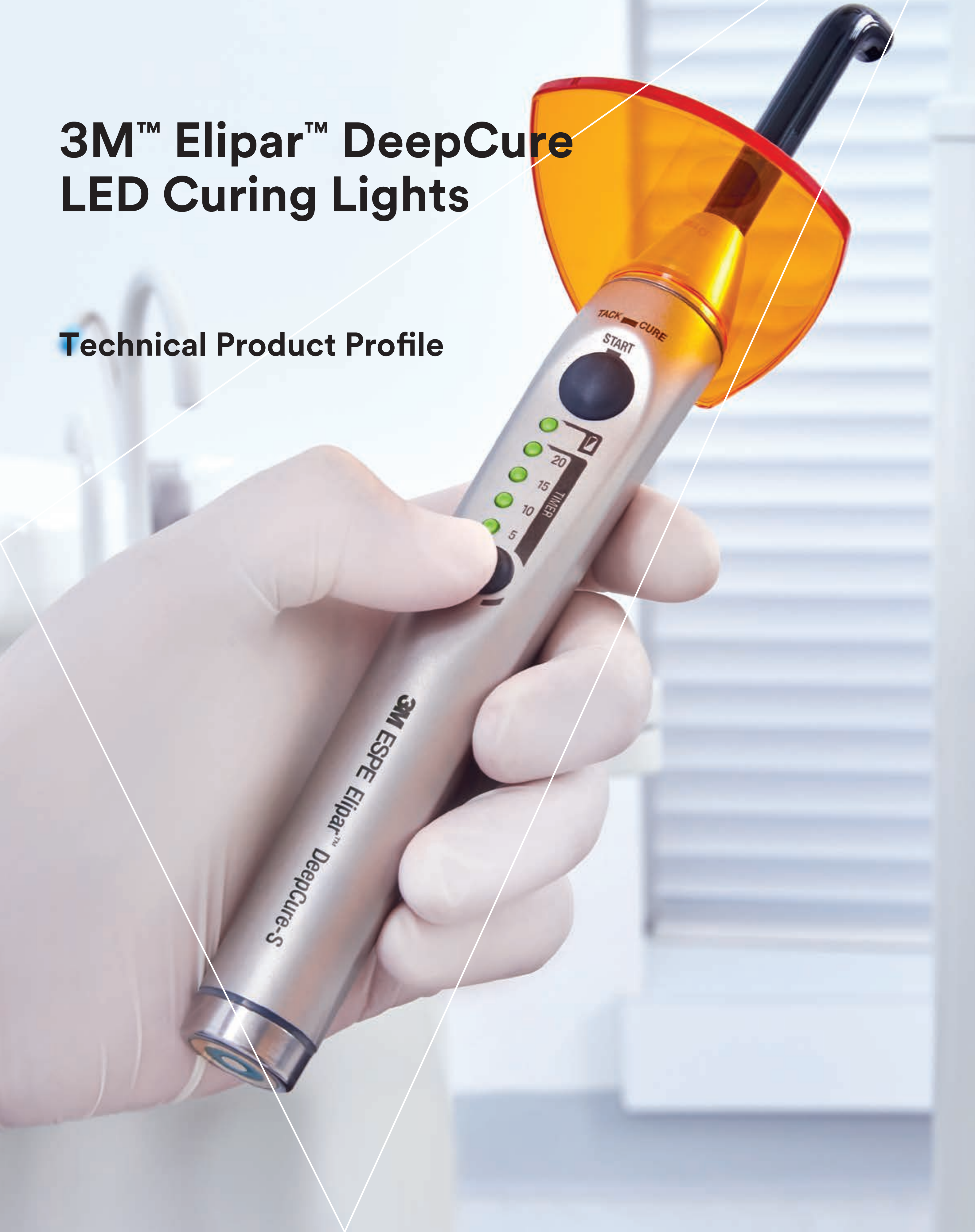
Science.
Applied to Life.™

3M™ Elipar™ DeepCure LED Curing Lights

Technical Product Profile



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NOTE: All tests referenced throughout this document were conducted using the 3M™ Elipar™ DeepCure-S LED Curing Light. However, the same test data applies to the 3M™ Elipar™ DeepCure-L LED Curing Light, as the technical performance is identical for both models.

Introduction

Dental professionals want predictability and confidence with their products and procedures, but sometimes the curing step can feel like a leap of faith. After all, if you can't see the resin composite material that's deep in the cavity, how can you be sure it's effectively polymerized? We took this as a challenge and created a new high-performing light that delivers a focused output of 1,470 mW/cm². Now, with the new 3M™ Elipar™ DeepCure LED Curing Lights, dental professionals can be more confident they have achieved a uniform and deep cure, even when they can't get the light in a perfect position.

The 3M™ Elipar™ DeepCure LED Curing Light is available in two models: stainless steel and lightweight plastic.

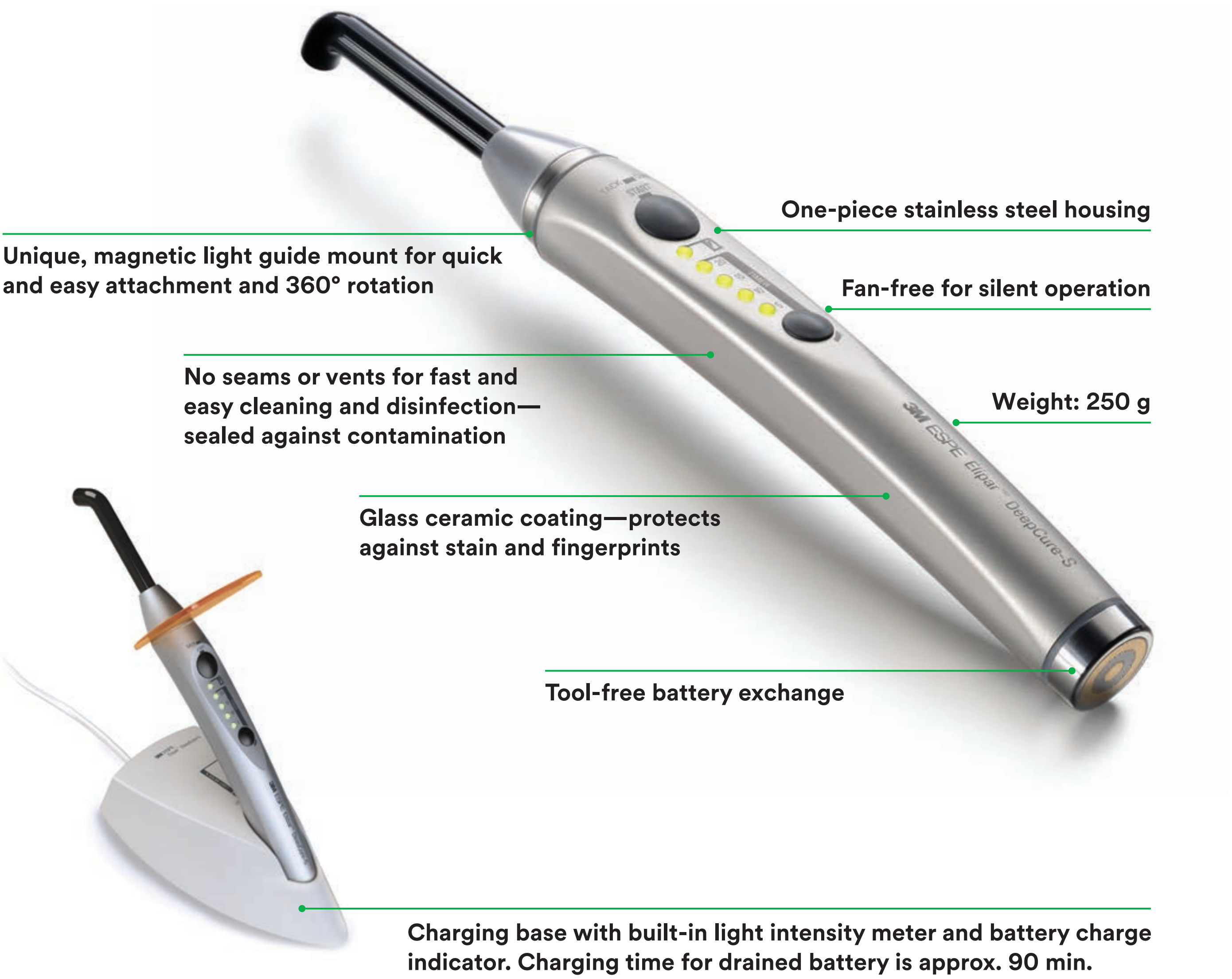
Dentists can choose from two models to match their preference: a high-quality, durable, stainless steel version and an equally high-performing lightweight model.

- 3M™ Elipar™ DeepCure-S LED Curing Light—"S" for the stainless steel version
- 3M™ Elipar™ DeepCure-L LED Curing Light—"L" for "light on weight" plastic version

It is important to note that both versions offer identical technical performance. The main differences between the two versions are the housing and how the units are charged.

3M™ Elipar™ DeepCure-S LED Curing Light

For dentists who enjoy the look, feel and durability of high-quality stainless steel



3M™ Elipar™ DeepCure-L LED Curing Light

For dentists who want high performance in a lightweight model

Technical Performance Data for Both Models	
Wavelength	430–480 nm
Light intensity	1,470 mW/cm² (-10%/+20%)
Power supply	Lithium-ion battery Approx. 120 min. battery runtime (~720 10-sec. cures) with constant light output regardless of battery charge
Operation	Intuitive two-button and single-mode operation Pre-set cure times: 5, 10, 15 and 20 sec., continuous mode (120 sec.) and tack cure mode
Curing time	Refer to material instructions; 10 sec. for many composites
Light guide	10 mm, black coated, autoclavable, optimal intraoral reach due to user- and patient-friendly geometry

A Deep, Uniform Cure

3M™ Elipar™ DeepCure LED Curing Lights hold true to their name. Due to optimized optics, you can be confident that your restorations will have a deep, uniform cure ... from center to rim—from surface to cavity bottom—and at any clinically relevant distance. Laboratory test results prove why.

Homogeneous Energy Distribution

More homogeneous energy distribution means composite restorations are cured more completely throughout the restoration, especially in deep cavities, providing a greater degree of cure and minimizing potential failures (e.g., undercured areas in the restoration).

Figure 1 shows the light penetration of different curing lights in SiO_2 brine. Light scatter and penetration show a more collimated beam profile and deeper transmission of light for the 3M™ Elipar™ DeepCure-S LED Curing Light[2] compared to competitive curing lights.

Comparison of light penetration

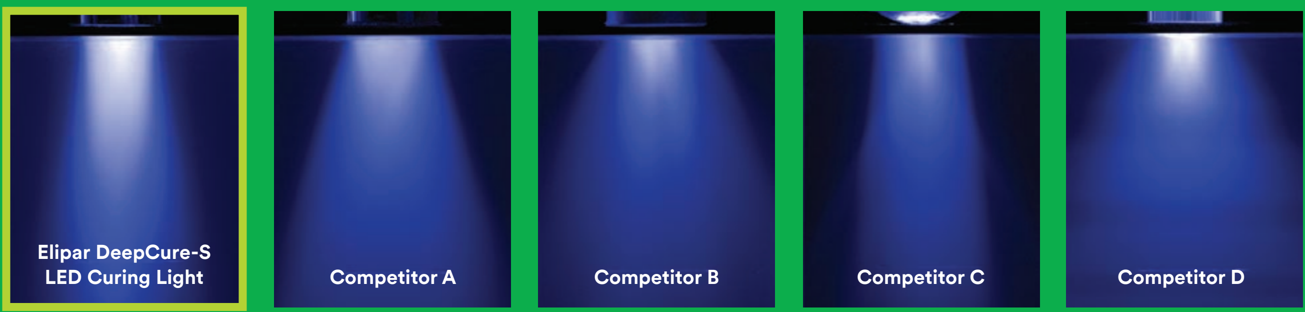


Figure 1: More homogeneous energy distribution throughout the restoration. Images comparing the light penetration of various light curing devices show that the 3M™ Elipar™ DeepCure-S LED Curing Light[2] produces a more collimated and uniform beam profile—even in deeper areas.
Source: 3M internal data

Method Used

Irradiance distributions across each light tip are measured at the emitting surface using a laser beam analyzer. The light of the light curing device is projected onto a diffusive surface of frosted quartz, and the light tip is placed in contact with this diffusive surface. The curing device is then turned on and the resulting image is recorded in the optical analysis software. The software is calibrated according to the pixel scale of the camera and the pixel dimensions to enable precise linear measurement of the light intensities. Lastly, filters are used to differentiate the spectral output for each image.

Beam profiles can be produced at different distances from the sensor in order to represent a reasonable range of clinical use.

[2] The 3M™ Elipar™ DeepCure-S LED Curing Light and the 3M™ Elipar™ DeepCure-L LED Curing Light have identical technical performance.

Clinical Implications

Having thoroughly cured restorations is key to long-lasting restorations and successful fulfillment of the treatment plan. As mentioned in the previous section, the beam homogeneity can be used to predict the clinical performance of a curing light. To double-check this, established experiments were performed to determine the clinical performance: Depth of Cure and Vickers Hardness.

Depth of Cure

ISO and modified ISO measurements consistently show equal or higher depth of cure, especially if the light positioning is difficult.

Figure 2 shows depth of cure results with 3M™ Filtek™ Bulk Fill Posterior Restorative and competitive curing lights.

The 3M™ Elipar™ DeepCure-S LED Curing Light helps to compensate for slight movements during curing, delivering the highest depth of cure, as shown below.

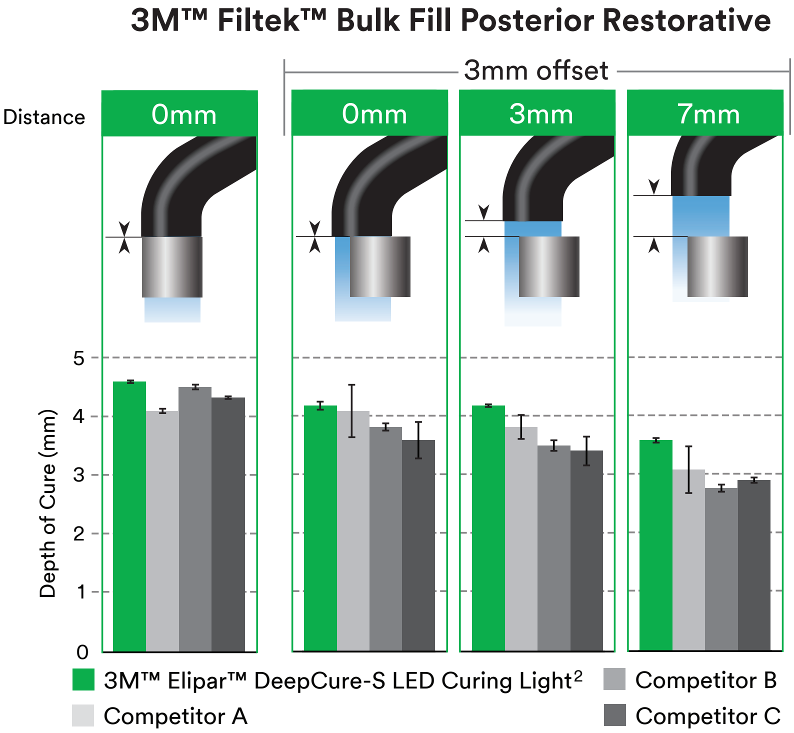


Figure 2: 3M™ Filtek™ Bulk Fill Posterior Restorative Shade A3, curing time 20 sec. (according to Instructions for Use).
Source: 3M internal data

NOTE: While the depth-of-cure measurements with 3M™ Elipar™ DeepCure LED Curing Lights deliver consistent results (small standard deviation), other curing lights show higher standard deviations. This is especially obvious with multi-wavelength devices because the beam profiles of the other curing lights are inhomogeneous—which is often caused by the use of multiple, different LEDs in multi-wavelength devices. During the clinical curing process, it cannot be controlled whether the best- or worst-fitting (emitted spectrum) LED is placed over the restoration, thus influencing the final curing result.

[2]The 3M™ Elipar™ DeepCure-S LED Curing Light and the 3M™ Elipar™ DeepCure-L LED Curing Light have identical technical performance.

Method Used

Method used for 0 mm centered: ISO 4049

Depth of cure is measured according to ISO standards. A composite is placed void-free in a metal cylinder (inner diameter—4 mm) with slight excess over the metal edge. It is compressed by a glass microscope slide until the upper surface of the composite is flat and even with the metal edge. The so formed composite column is then cured according to the manufacturer's Instructions for Use and then pressed out of the metal form by applying pressure on the cured surface. The lower, uncured part of the composite body is scraped off by a spatula until the cured hard part of the column is reached. The height of the residual fully cured composite—divided by 2—is the obtained depth-of-cure value.

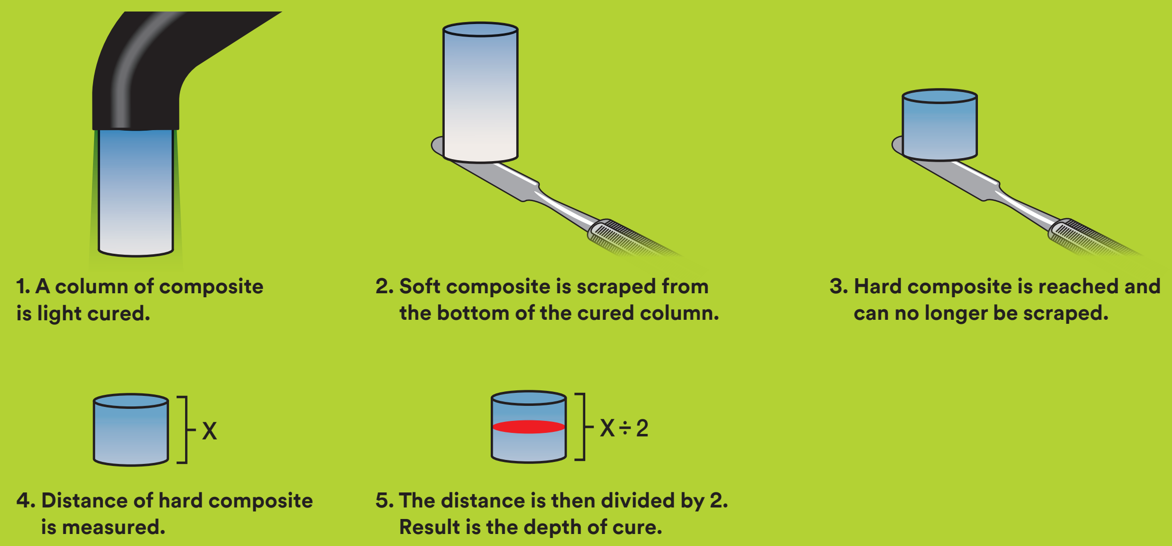


Figure 3: Description of the ISO standard measurement of depth of cure.

Method used for all other conditions: modified ISO 4049 measurement

A modified measurement determines the depth of cure at a non-centered (3mm offset) light guide positioning with different distances to curable composite. This simulates the clinical situation where optimal positioning of the light guide may be challenged by circumstances.

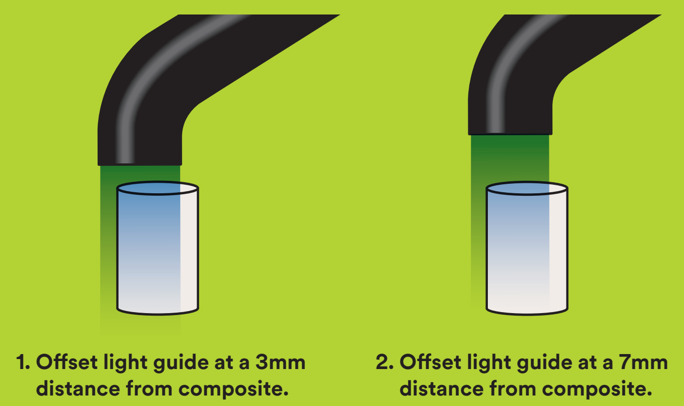


Figure 4: Description of the modified ISO 4049 measurement of depth of cure at a non-centered light guide positioning.

Vickers Hardness

In addition to the depth-of-cure measurement, a second method was picked to prove the performance of the 3M™ Elipar™ DeepCure LED Curing Lights. Vickers hardness is a measure of the hardness of a material, calculated from the size of an impression produced under load by a pyramid-shaped diamond indenter.

Vickers hardness is known to correlate to the degree of polymerization within a specimen. The comparison of the obtained value at the surface and within the specimen shows the degree of conversion curve within the composite.

The evaluation of four different composites—with three different curing lights—confirms the results obtained by the depth-of-cure measurements discussed above. It validates statistically that the homogeneous beam profile leads to more consistent curing results (measured values in the center (solid lines) of the specimen are very similar to the values obtained at the edge of the specimen (dotted lines)). In addition to that, the curves obtained with the 3M™ Elipar™ DeepCure-S LED Curing Light do not decrease as much as the curves obtained with the other curing lights when going from the surface (0 mm) to the bottom of the restoration (5.6 mm). Again, the statistics validate the obtained depth-of-cure values.

Figures 5–8 show the Vickers hardness of leading composite filling materials in combination with different curing lights.

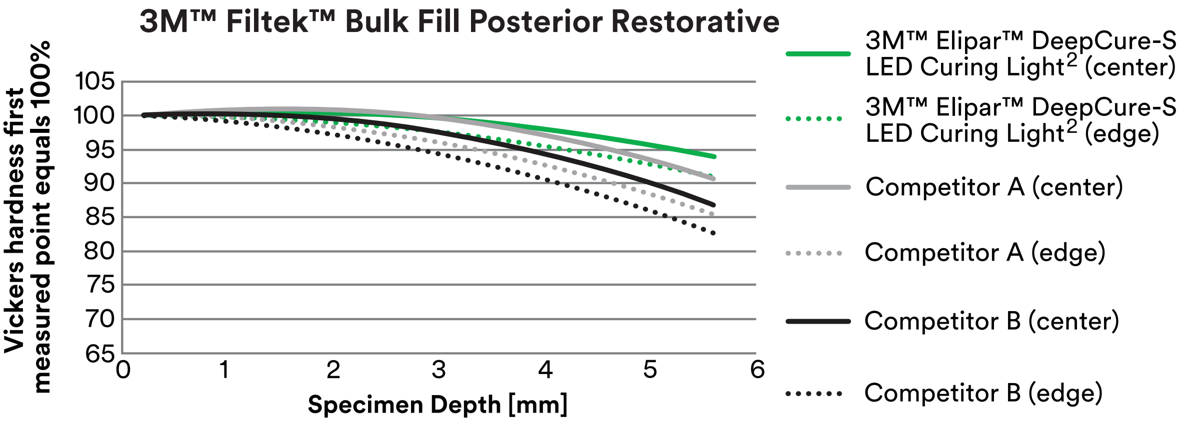


Figure 5: Vickers hardness measured in different depths in the center and at the edge of a 3M™ Filtek™ Bulk Fill Posterior Restorative specimen. Shade A3, curing time 20 sec. (according to Instructions for Use).

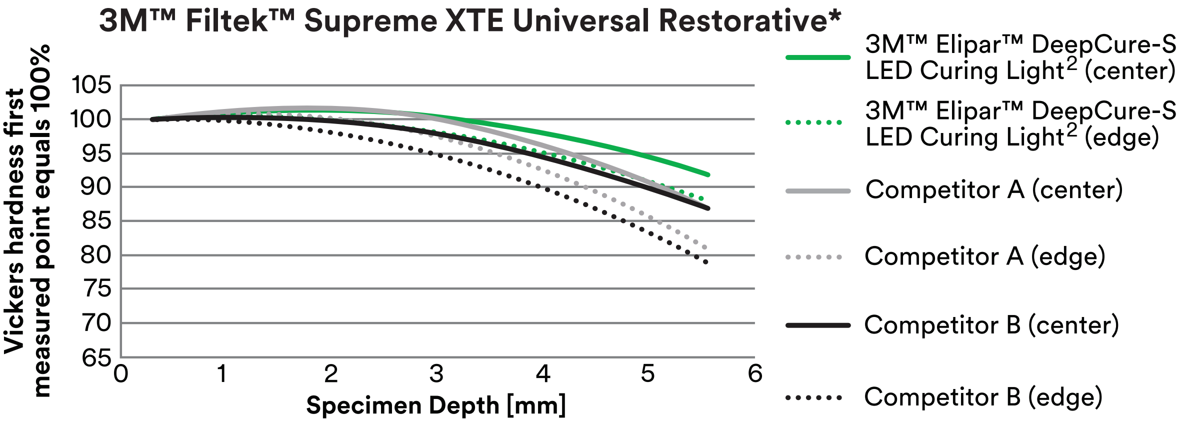


Figure 6: Vickers hardness measured in different depths in the center and at the edge of a 3M™ Filtek™ Supreme XTE Universal Restorative specimen. Shade A3, curing time 20 sec. (according to Instructions for Use).

[2]The 3M™ Elipar™ DeepCure-S LED Curing Light and the 3M™ Elipar™ DeepCure-L LED Curing Light have identical technical performance.

*Chart is illustrative of curing light performance. 3M™ Filtek™ Supreme XTE Universal Restorative is indicated for restorations up to 2 mm in depth. For B,E,T shades, a 10-second cure is indicated with high-powered LED curing lights.

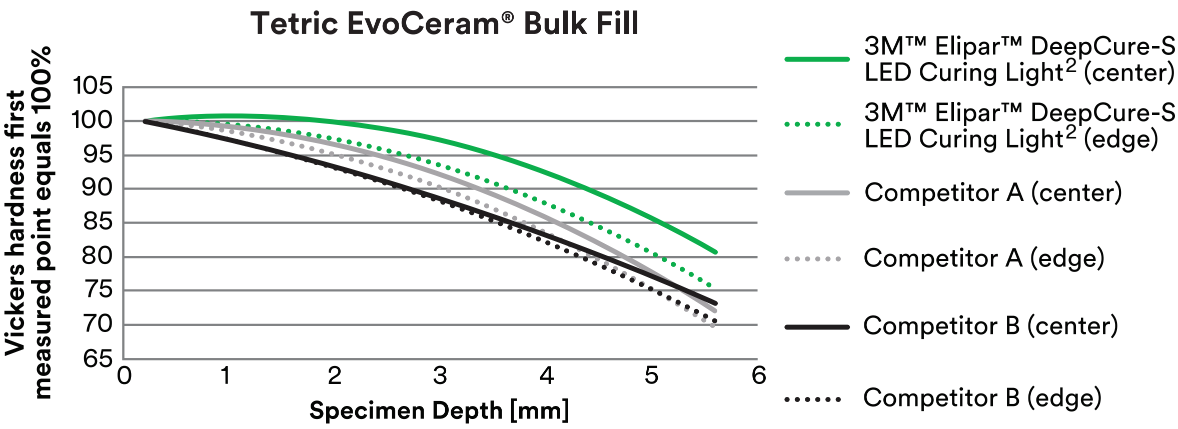


Figure 7: Vickers hardness measured in different depths in the center and at the edge of a Tetric EvoCeram® Bulk Fill specimen. Shade IVA, curing time 10 sec. (according to Instructions for Use).

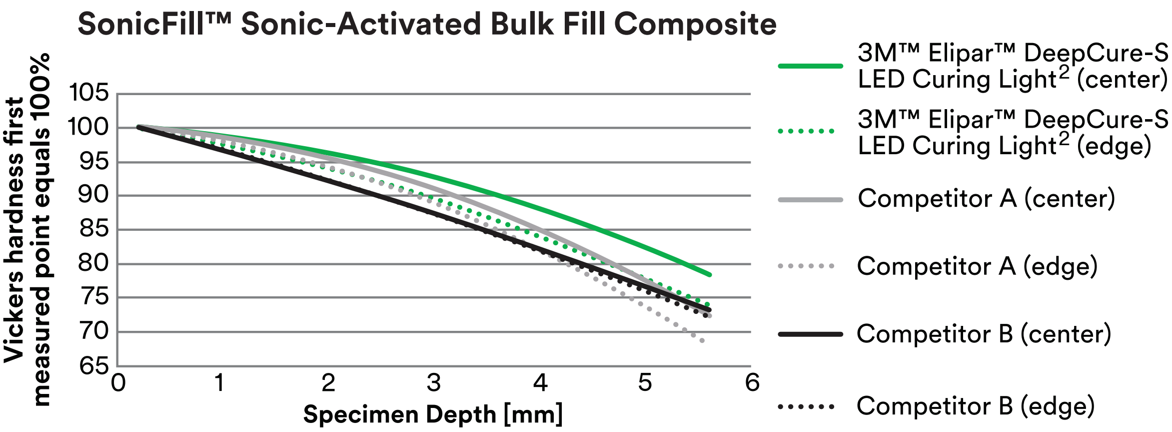


Figure 8: Vickers hardness measured in different depths in the center and at the edge of a SonicFill™ Sonic-Activated Bulk Fill Composite specimen. Shade A3, curing time 20 sec. (according to Instructions for Use).

Method Used

Preparation of specimen

Comparisons of hardness profiles of different composite restoratives cured with different light devices were conducted. Cylinder-shaped composite specimens (Figure 10) were prepared by placing the restorative material into a metal ring (height 6 mm, inner diameter 10 mm). Subsequently, a glass plate (thickness 1 mm) was placed on the metal ring, with an identical metal ring over it (Figure 9). The composite cylinder was then light cured with the curing tip of the light device placed in the center of the upper metal ring (Figure 9). To analyze the polymerization quality within the specimens, Vickers hardness was determined using an automatic micro hardness indenter. Hardness profiles were measured in the center and on the edge of the cured specimen, and from the top to the bottom of the 6mm-thick composite layer (Figure 11).

[2]The 3M™ Elipar™ DeepCure-S LED Curing Light and the 3M™ Elipar™ DeepCure-L LED Curing Light have identical technical performance.

Setup

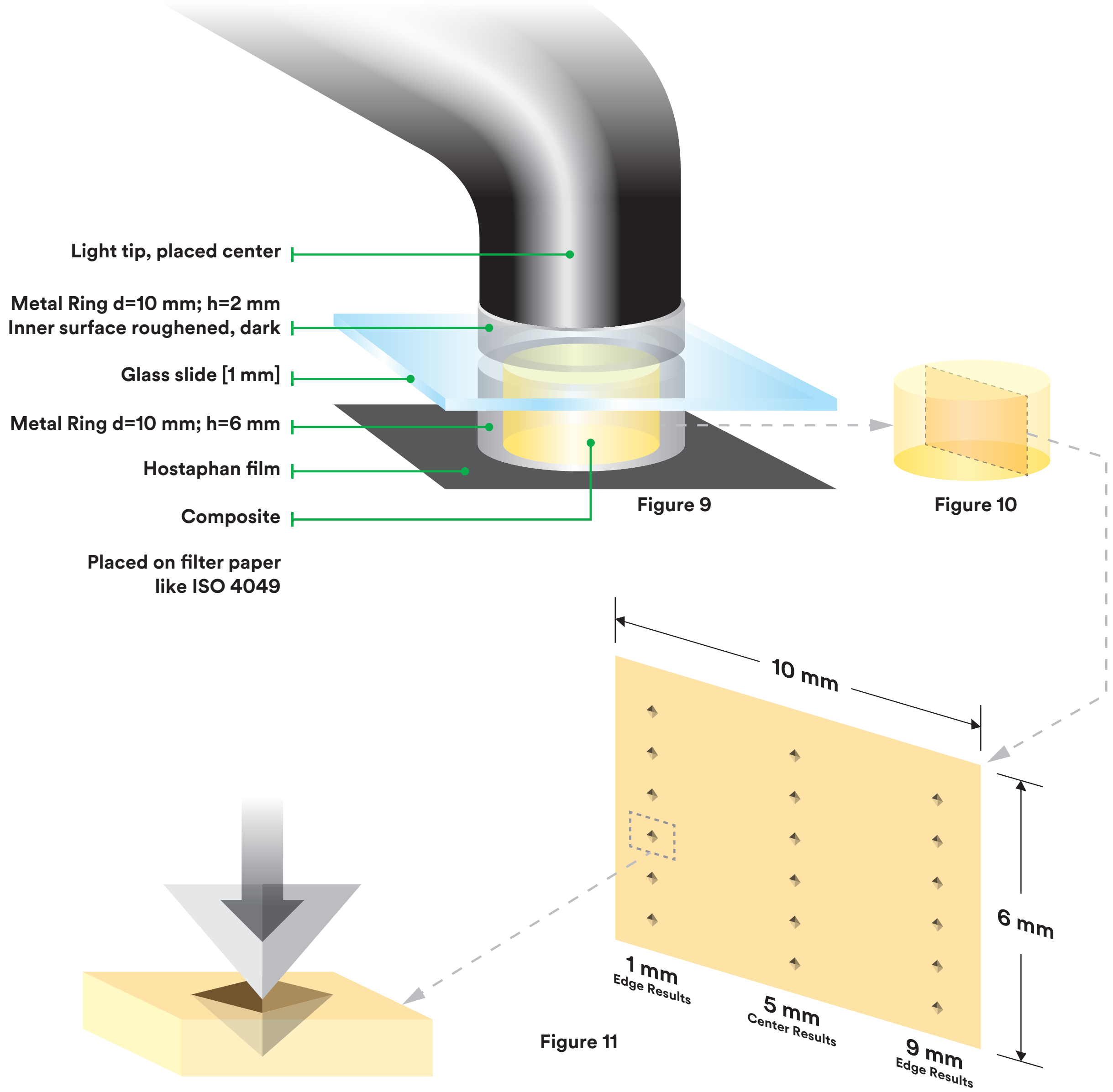


Figure 9

Figure 10

Figure 11

Measurement of Vickers Hardness

The test procedure was carried out with controlled force: the test load increased and decreased with constant speed between 0.4 mN and 500 mN. The load and penetration depth were continuously measured. The material's ability to resist plastic deformation from a standard source was evaluated. The unit of hardness given by the test is known as the Vickers Pyramid Number (HV) or Diamond Pyramid Hardness (DPH) and is determined by the load over the surface area of the indentation.

Dentist Satisfaction Ratings

Application Test Results

During product development, an application test was conducted using the 3M™ Elipar™ DeepCure-S LED Curing Light. The same results apply to the 3M™ Elipar™ DeepCure-L LED Curing Light as the technical performance is identical for both models.

Over 11,000 restorations were cured by 40 dentists from the United States, Germany, Turkey and Denmark using the Elipar DeepCure-S LED curing light in their offices. The dentists then evaluated the in vivo performance of the device after the trial period of nine weeks.

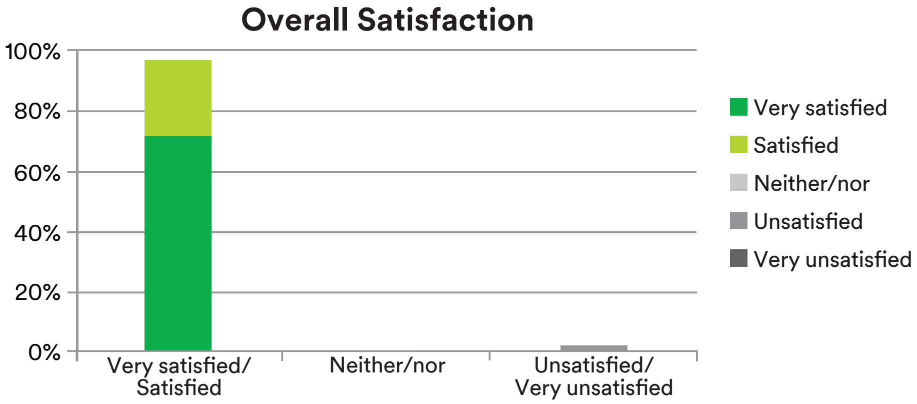


Figure 12: 98% of dentists who used 3M™ Elipar™ DeepCure-S LED Curing Light clinically were either satisfied or very satisfied with the curing light.

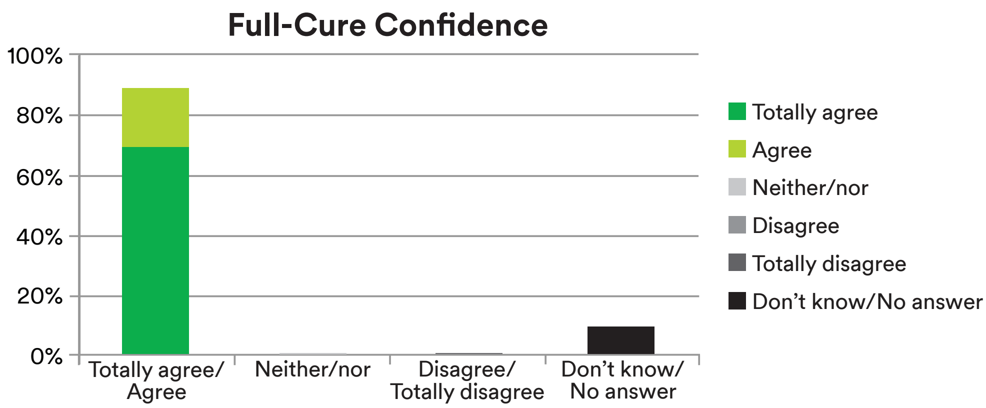


Figure 13: 90% of dentists who used 3M™ Elipar™ DeepCure-S LED Curing Light clinically agreed or totally agreed that the Elipar DeepCure-S LED curing light increases their confidence of a full cure to the bottom of the proximal box.

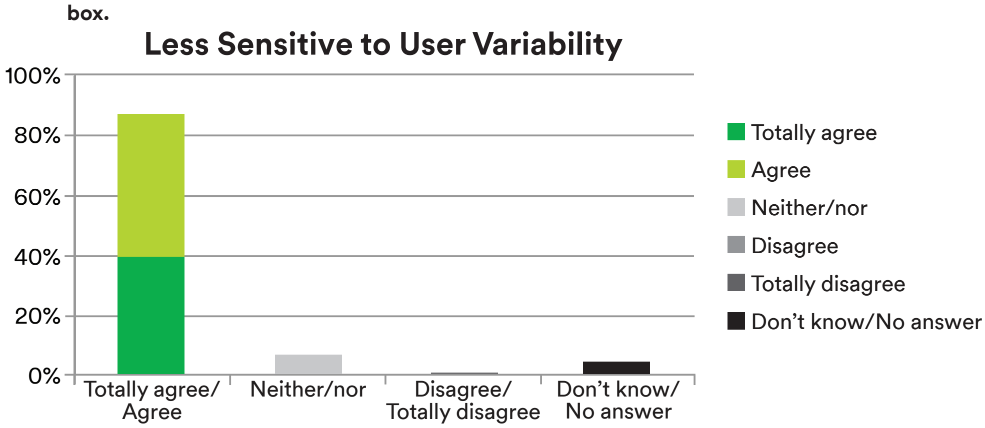


Figure 14: 88% of dentists who used 3M™ Elipar™ DeepCure-S LED Curing Light clinically agreed or totally agreed that the Elipar DeepCure-S LED curing light makes the curing process less error-prone (less sensitive to user variability).

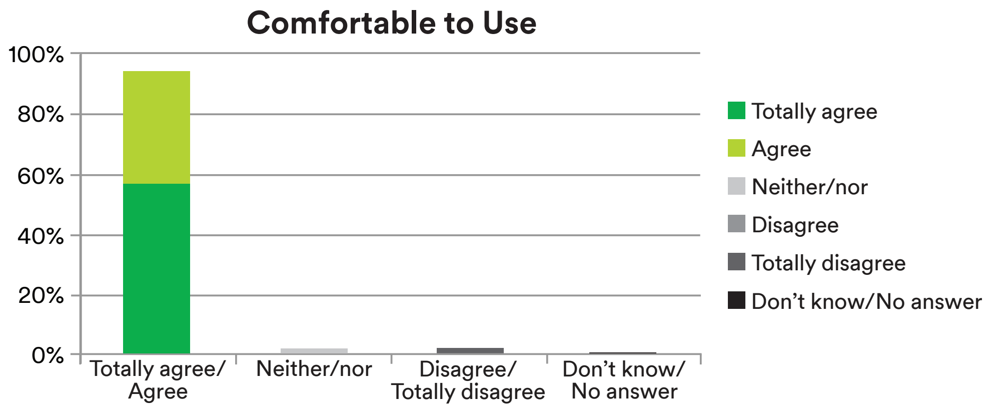


Figure 15: 95% of dentists who used 3M™ Elipar™ DeepCure-S LED Curing Light clinically agreed or totally agreed that the Elipar DeepCure-S LED curing light is comfortable for the operator.

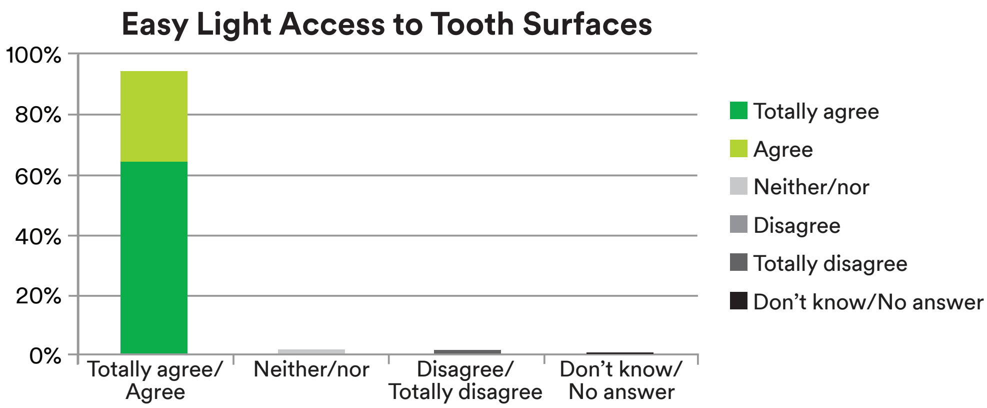


Figure 16: 95% of dentists who used 3M™ Elipar™ DeepCure-S LED Curing Light clinically agreed or totally agreed that the Elipar DeepCure-S LED curing light allows easy light access to all (even hard-to-reach) tooth surfaces.

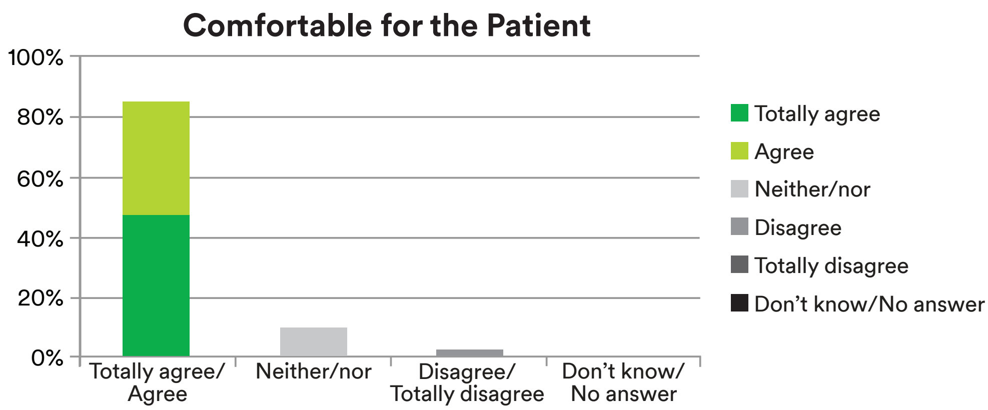


Figure 17: 85% of dentists who used the 3M™ Elipar™ DeepCure-S LED Curing Light agreed or totally agreed that the Elipar DeepCure-S LED curing light is comfortable for the patient (even for patients with limited mouth-opening capability). (See "Opening angle compared to leading curing lights" pictured on page 19.)

Heat Generation

All LED curing lights produce heat during polymerization. But it is known that numerous dental restorative treatments are also potential sources of temperature increase in dental tissues, such as:

- Preparation of crown with air-cooled, high-speed instruments up to 8.8°C increase[3]
- Fabrication of direct provisional methacrylate resin crowns up to 19.1°C increase[4]
- Thermoplasticized canal obturation up to 22.1°C[5]
- Post removal with ultrasonic device up to 40.4°C[6]

However, the question is, what temperature will cause irreversible thermal damage to the pulp and other dental tissues?

On the other hand, pulpitis is not only caused by thermal irritation, but also by physical damage during the removal of tooth structure. Therefore, it is rather difficult to judge the cause of pulpal damage.

In the past, numerous in vivo studies have evaluated the response of the pulp and other dental tissues to thermal irritation and the temperature at which thermal damage is initiated and reported different results. This indicates that the range of safe temperatures in dental tissues, particularly the dental pulp, is actually not known:

- In vivo animal study by Zach and Cohen[7] stated that an intrapulpal temperature increase of 5.5°C caused pulpitis or pulp necrosis in 15% of irritated teeth.
- In vivo study by Eriksson and Albrektsson[8] reported that 10°C temperature increase caused bone resorption and tooth ankyloses.
- In vivo study by Baldissara, et al.[9] suggested that an average increase of 11.2°C does not damage the pulp.

Based on current medical complaint history on the predecessor LED curing lights 3M™ Elipar™ S10 LED Curing Light/3M™ Elipar™ LED Curing Light, no adverse events were reported to 3M for this product. Therefore, thermal irritation can most likely be excluded as an issue during polymerization.

To evaluate the effect of the higher intensity of 3M™ Elipar™ DeepCure LED Curing Lights compared to the predecessor LED curing lights on maximum pulp temperature increase, an in vitro evaluation was performed:

Human molars were prepared by removing the pulpal material, cutting the roots and inserting thermocouples as shown in the radiographs on the next page. Class II and Class V preparations were made with 1.5 and 0.5 mm of dentin remaining respectively. The tooth was submerged up to the cement-enamel junction in a 35°C water bath and light cured for 10 seconds.

Source:

[3] **Baldissara, P., Catapan, S., & Scotti, R. (1997). Clinical and histological evaluation of thermal injury thresholds in human teeth: a preliminary study. *Journal of Oral Rehabilitation, 24*, 791–801.**

[4] **Tjan, A. H. L., Grant, B. E., & Godfrey, M. F. (1989). Temperature rise in the pulp chamber during fabrication of provisional crowns. *Journal of Prosthetic Dentistry*, *62*, 622.**

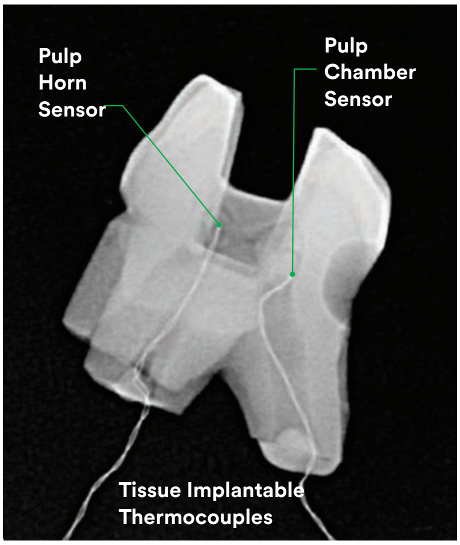
[5] **Lipski, M. (2006). In Vitro Infrared Thermographic Assessment of Root Surface Temperatures Generated by High-Temperature Thermoplasticized Injectable Gutta-Percha Obturation Technique. *J Endod, 32*, 438–441.**

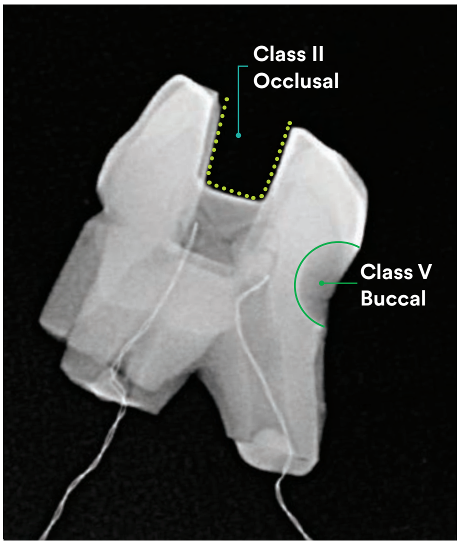
[6] **Kwon, S.J., Park, Y.J., Jun, S.H., Ahn, J.S., Lee, I.B., Cho, B.H., Son, H.H., & Seo, D.G. (2013). Thermal irritation of teeth during dental treatment procedures. *Restor Dent Endod Aug, 38*(3), 105-112.**

[7] **Zach, L., Cohen, G. (1965). *Oral Medicine, Oral Pathology, 19*(4), 515–530.**

[8] **Eriksson, A.R., Albrektsson, T. (1983). *Journal of Prosthetic Dentistry, 50*(1), 101–107.**

[9] **Baldissara, P., Catapano, S., & Scotti, R. (1997). *Journal of Oral Rehabilitation, 24*, 791–801.**

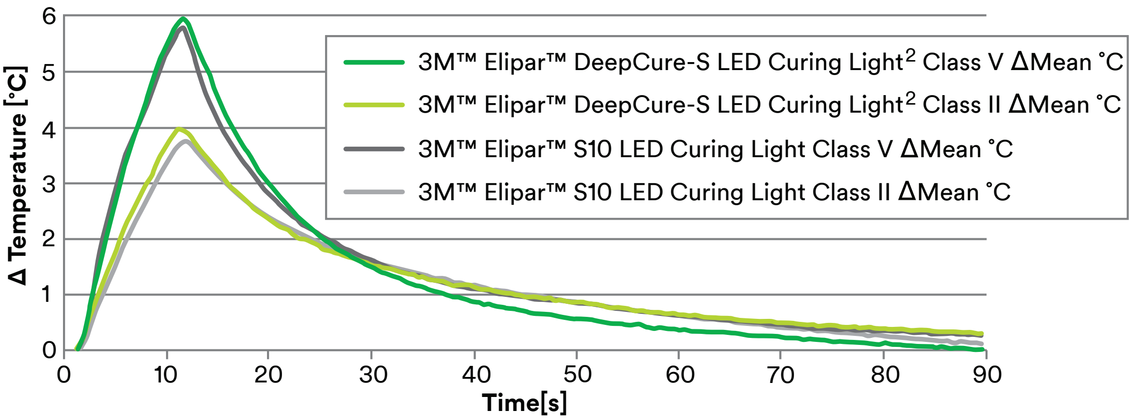




Statistics showed no significant difference in pulp temperature increase for restorations cured with 3M™ Elipar™ DeepCure-S LED Curing Light and 3M™ Elipar™ S10 LED Curing Light.

3M™ Elipar™ S10 LED Curing Light vs. 3M™ Elipar™ DeepCure-S LED Curing Light[2]

Comparison of temperature increase with 10-second curing time for Class II and Class V cavities



Source: 3M internal data

How to manage heat development—clinical tips from external experts

Based on a consensus statement at the symposium on light curing in dentistry held at Dalhousie University, Halifax, Canada, in 2014, the following clinical guidelines help to minimize thermal pulp and tissue damage:

1. Polymerization with external cooling from an air flow
2. Polymerization at intermittent intervals (e.g., 2 exposures lasting 10 seconds each instead of 1 exposure lasting 20 seconds)

[2]The 3M™ Elipar™ DeepCure-S LED Curing Light and the 3M™ Elipar™ DeepCure-L LED Curing Light have identical technical performance.

Clinical Case

Initial situation: A 56-year-old female patient with insufficient amalgam fillings—upper right pre-molar and upper right molars. The patient was interested in a fast, high-quality, economic solution.

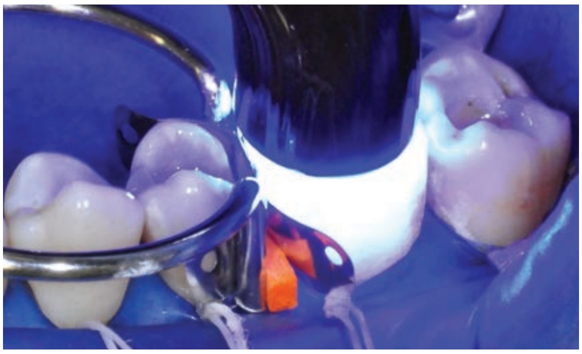
Treatment plan: After consulting with the patient, a decision was made to replace the amalgam restorations with composite. The amalgam restorations were removed and the carious tooth substance excavated under local anesthesia. New fillings were placed using 3M™ Filtek™ Bulk Fill Posterior Restorative.*

Initial situation: Multiple insufficient amalgam restorations of upper posterior teeth.

Removal of amalgam restorations and final preparation of teeth.

Selective enamel etching with 3M™ Scotchbond™ Universal Etchant.

Application of 3M™ Scotchbond™ Universal Adhesive.



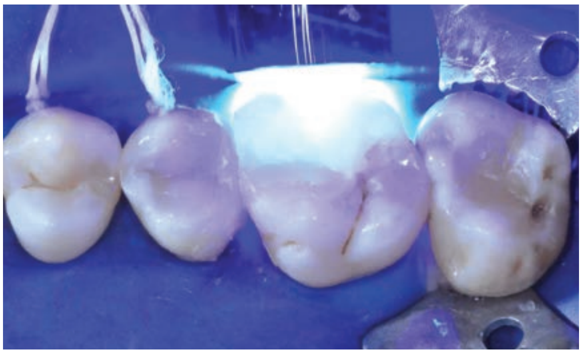
Polymerization of 3M™ Scotchbond™ Universal Adhesive using 3M™ Elipar™ DeepCure-S LED Curing Light.

Application of 3M™ Filtek™ Bulk Fill Posterior Restorative A3 into the cavity.

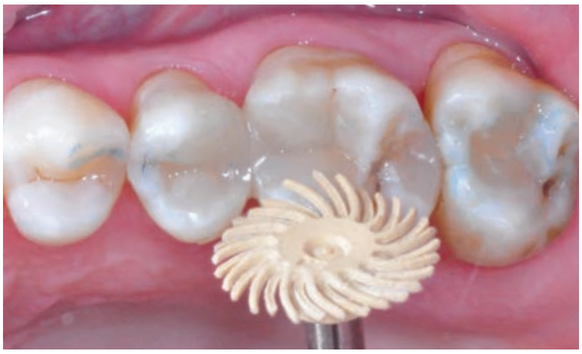
***Refer to the Instructions for Use for more information**

Shaping of occlusion of first upper molar followed by curing of occlusion (10 seconds).

Bulk placement of 3M™ Filtek™ Bulk Fill Posterior Restorative into upper premolar.



Polymerization of 3M™ Filtek™ Bulk Fill Posterior Restorative from buccal and lingual surfaces (10 seconds each) using 3M™ Elipar™ DeepCure-S LED Curing Light.



Occlusal finishing of restorations with 3M™ Sof-Lex™ Spiral Finishing Wheel.

Final polishing of restorations with 3M™ Sof-Lex™ Spiral Polishing Wheel.

Final 3M™ Filtek™ Bulk Fill Posterior Restorative restorations.

*Refer to the Instructions for Use for more information.

Clinical photos courtesy of Dr. Stergios Zafiriadis, Zollikerberg, Switzerland.

Frequently Asked Questions

1. What is new: 3M™ Elipar™ DeepCure LED Curing Lights vs. predecessors 3M™ Elipar™ S10 LED Curing Light and 3M™ Elipar™ LED Curing Light?

Optics

- The optics have been changed significantly (added lens, changed reflector geometry, additional reflective element between lens and light guide) to achieve the homogeneous and collimated beam.
- The new optics lead to a more efficient usage of the battery, resulting in a longer battery runtime.

Power output

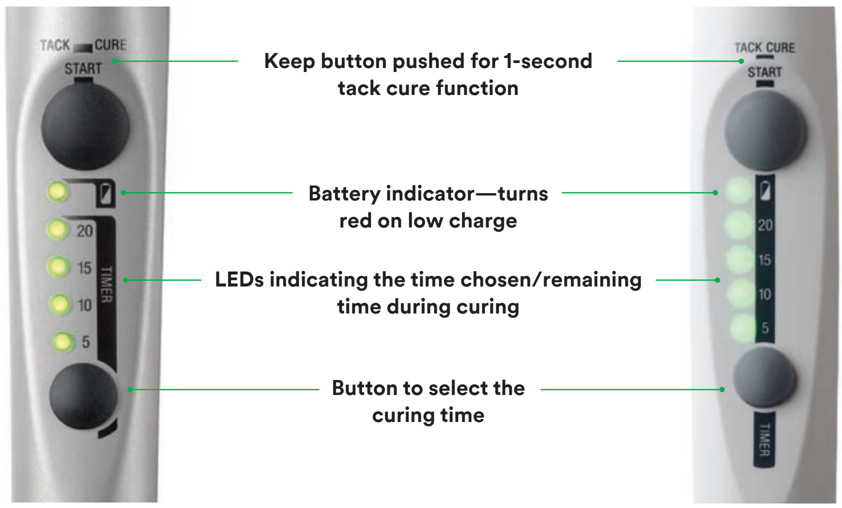
- 1.470 mW/cm² (-10%/+20%) vs. 1.200 mW/cm² (-10%/+20%)

Handpiece

- New printing/ guidance symbols for more information, easier usage, e.g., tack curing.

3M™ Elipar™ DeepCure-S LED Curing Light

3M™ Elipar™ DeepCure-L LED Curing Light



Light guide

- Black coating to reduce stray light and prevent glare
- Optimized light guide tip angle and tip height for better intraoral handling

Elipar DeepCure LED curing lights have a new light guide design that significantly reduces the opening angle required to reach a posterior restoration. This results in improved patient comfort and easier handling for the operator.

Opening angle compared to leading curing lights.


3M™ Elipar™ DeepCure-S LED Curing Light, 3M

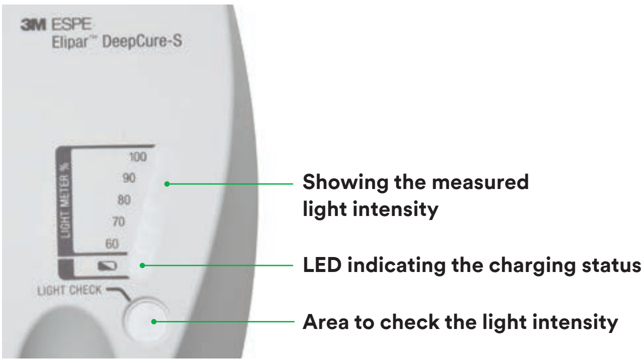

Competitor A


Competitor B

Charging Base

The top part of the housing is made of a new material, which makes it more resistant against disinfecting agents.

- New design/printing to make available functions more visible to the operator.



2. What is the difference between 3M™ Elipar™ DeepCure-S LED Curing Light vs. 3M™ Elipar™ DeepCure-L LED Curing Light?

The different curing lights have been made to serve different customers. However, both devices use the same optics and the same electronics inside, offering the same performance.

Housing

- Elipar DeepCure-S LED curing light: One-piece stainless steel housing
- Elipar DeepCure-L LED curing light: Lightweight, robust plastic housing

Light guide

- Elipar DeepCure-S LED curing light: Magnetic, easy on and off coupling
- Elipar DeepCure-L LED curing light: Friction-fit interface to curing light

Charging

- Elipar DeepCure-S LED curing light: Charging base with built-in light intensity meter and battery charge indicator
- Elipar DeepCure-L LED curing light: Charging plug

Light Intensity Measurement

- Elipar DeepCure-S LED curing light: Light intensity meter built into charging base
- Elipar DeepCure-L LED curing light: Provided curing disc

3. How was the collimated and homogeneous beam realized?

The geometrically optimized combination of the three elements leads to the collimated and homogeneous beam profile:

- LED
- Lens
- Diamond-turned reflector

Each component was specially designed to work best in combination with the other involved components, and the combination of all elements leads to the technical performance.

Compatability

4. Can the new black light guide be used with the 3M™ Elipar™ S10 LED Curing Light?

- 3M™ Elipar™ DeepCure-S LED Curing Light: The light guide is not interchangeable with the Elipar S10 LED curing light and vice versa (incompatible due to construction differences).
- 3M™ Elipar™ DeepCure-L LED Curing Light: The light guide fits geometrically into the 3M™ Elipar™ LED Curing Light, but due to different optical properties (resulting in an increase/decrease of light intensity), the corresponding light guide must be used.

5. Can I use my old Elipar S10 LED curing light charging station to charge the new Elipar DeepCure-S LED curing light?

Yes.

6. Can I use my old Elipar LED curing light power supply to charge the new Elipar DeepCure-L LED curing light?

Yes.

7. Can I use the light intensity meter in my old Elipar S10 LED curing light charging station to measure the intensity/output of the new Elipar DeepCure-S LED curing light/Elipar DeepCure-L LED curing light?

No. This will result in erroneous readings. Only the light intensity meter in the charging station of the new Elipar DeepCure-S LED curing light should be used to test the new Elipar DeepCure-S LED curing light. As the Elipar DeepCure-L LED curing light has the same perfomance, it can be measured on an Elipar DeepCure-S charging station, too.

8. Can I use the light intensity meter of the new Elipar DeepCure-S LED curing light charging station to measure the intensity/output of my old Elipar S10 LED curing light charging station?

No. This would give incorrect test results. The included light intensity meter is specifically calibrated for the Elipar DeepCure-S LED curing light.

Curing Time/Curing Increments

9. Can I reduce the curing time with the new curing lights?

Research has shown that shorter curing times may lead to very inconsistent results. That's why we always recommend to use the curing times given by the manufacturer of the material.

10. Can I place thicker increments of my existing composite with the new curing lights?

No. While the new light helps assure more even and efficient curing, we do not recommend placing thicker increments. Please follow the incremental thickness recommendations provided by the manufacturer of the restorative.

Heat Development/Heat Management

11. Do I have to be concerned about the increased intensity and resulting heat development when using the new curing lights?

All high-intensity curing lights (over 1.100 mW/cm²) cause a certain amount of heat.

In the past, numerous in vivo studies have evaluated the response of the pulp and other dental tissues to thermal irritation and the temperature at which thermal damage is initiated and reported different results. This indicates that the range of safe temperatures in dental tissues, particularly the dental pulp, is actually not known.

To address concerns of potential thermal irritation of the pulp, the following two techniques will manage heat development during polymerization:

1. Polymerization with external cooling from an air flow
2. Polymerization at intermittent intervals (e.g., 2 exposures lasting 10 seconds each instead of 1 exposure lasting 20 seconds)

For further information on thermal irritation, please refer to pages 15–16.

12. Can I use my fingernail or the back of my hand to assess the heat generation of the curing light?

We clearly do not recommend this test method as a fingernail or the back of a hand does not have the same properties or thickness of a tooth. The dense areas of nerve endings make the fingers extremely sensitive to heat, whereas the pulp is highly vascularized and contains a regulatory system for heat distribution in teeth, capable of dissipating external thermal stimuli.

Battery

13. What battery is included?

3M™ Elipar™ DeepCure LED Curing Lights feature a long-life, high-performance Li-ion battery.

14. How long does it take to (re)charge the battery?

3M™ Elipar™ DeepCure-S LED Curing Light: 90 min. (charging station)

3M™ Elipar™ DeepCure-L LED Curing Light: 120 min. (charging cable)

The charging station of the Elipar DeepCure-S LED curing light allows a higher charging current than the charging cable of the Elipar DeepCure-L LED curing light, leading to a shorter charging time.

15. How long does a single charge last?

Battery runtime is approximately 120 min. with constant light output regardless of battery charge (720 × 10 sec.).

16. What has allowed the battery runtime to double with the new light?

The longer battery runtime could be realized due to the use of the latest LED generation in combination with the newly developed, highly effective optics. This new optic allows a higher efficacy, although a higher energy output was realized.

17. Can I replace the battery myself?

- 3M™ Elipar™ DeepCure-S LED Curing Light: Yes.
- 3M™ Elipar™ DeepCure-L LED Curing Light: No.

However, the Elipar DeepCure-L LED curing light batteries can be replaced through the authorized service center.

Light Guide

18. Can the new black light guide be purchased separately?

Yes. The light guide is available as an accessory.

19. Are other light guide sizes available?

No. Currently, 3M™ Elipar™ DeepCure LED Curing Lights are marketed with a 10mm light guide only.

Functions

20. What is the tack cure function?

Quite a few dental procedures require a very short initial cure (or "tack cure") at some point of the processing before the final curing. Examples are the excess removal of light-curing cements (e.g., 3M™ RelyX™ Unicem Self-Adhesive Resin Cement) or the pre-cure step of 3M™ Protemp™ Crown Temporization Material.

Currently, tack curing is done by switching on the curing light and switching it off again after a short period of time (1–5 seconds). This procedure is not very convenient in handling and does not deliver reproducible tack cure times.

With the unique tack cure function, Elipar DeepCure LED curing lights produce a reproducible short light pulse by simply keeping the start button pressed. The tack cure function makes excess removal of light curing cements easier and more predictable.

21. I like the fan-free silence. Can the beeps also be switched off?

Yes. Elipar DeepCure LED curing lights offer a switch-off function for the beeps. This is how it works: Put the handpiece in sleep mode, e.g., by setting it in the charger. Take the device from the charger: press first the TIME button, then the START button. The beeps are now switched off. The acoustical signals can be reactivated by following the same procedure.

Sterilization/Hygiene

22. How can I clean and disinfect the device?

Clean all components with a soft cloth and, if necessary, a mild cleaning agent (e.g., dishwashing detergent). Solvents or abrasive cleaners can damage the components. Cleaning agents must not enter the device.

To disinfect all components, spray the disinfectant on a towel and use it to disinfect the unit. Do NOT spray the disinfectant directly on the device.

For detailed information on cleaning/disinfecting, see Instructions for Use.

23. How can I clean and disinfect the light guide?

The fiber-optic glass light guide is autoclavable. See Instructions for Use for details.

24. Can I use a spray disinfectant on the charging station?

Cleaning agents must not enter the unit! To disinfect all components, spray the disinfectant on a towel and use it to disinfect the unit. Do not spray the disinfectant directly on the device. Disinfectant agents must not enter the unit!

25. May I put the light guide in a combined washer/disinfector machine?

Yes. Details on automized cleaning and disinfection are available from the 3M Service Center.

26. What are the dangers of disinfecting the light guide with only a wipe and not sterilizing with autoclave and steam?

There is no way to control the variability between individuals using a wipe to disinfect a light guide. The only sure way to disinfect the light guide is sterilizing with autoclave and steam.

27. What disinfectants do you recommend for the plastic and stainless steel housing?

We do not recommend a specific disinfectant, as we cannot control potential changes in composition, but our lab tested the most common disinfectants/substances and none of them had a negative impact on the plastic housing.

Also, the grey-colored part of the plastic housing is coated to make it even more resistant against discoloration potentially caused by disinfectants.

If in doubt, ask the manufacturer of the disinfectant if its constant use will damage plastic surfaces (for details, see Instructions for Use).

28. Can I sterilize the orange glare shield?

No. Only wipe disinfection is allowed for the glare shield.

29. Can I use a barrier sleeve with 3M™ Elipar™ DeepCure LED Curing Lights?

Elipar DeepCure LED curing lights have no vents that might be blocked by a barrier sleeve. Therefore, they can be used with a barrier sleeve (not offered by 3M). Make sure the sleeve is not covering the tip of the light guide, as this would diminish the intensity. Furthermore, the sleeve should be removed before placing the light guide in the charger to make sure the pins in the charger are contacting the battery properly.

Materials Used

30. What plastic is used in the 3M™ Elipar™ DeepCure-L LED Curing Light?

PA 6 (Polyamide 6) per definition is a very robust material, resistant against disinfectants and shatter-proof.

Poly Wave Device

31. Why don't you offer a poly wave device?

Most often used initiator system is camphorquinone, which works best with the wavelength that most devices provide (450 nm). The issue with poly wavelength systems is that the beam profile is very inhomogeneous, leading to very inconsistent/hard-to-predict curing results (leading to large standard deviations). We decided to use a single wavelength LED, as this delivers more consistent/predictable curing results even for materials using other photoinitiators e.g., Tetric EvoCeram® Bulk Fill from Ivoclar Vivadent.

Notes

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