

# Curing Lights in Focus

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JUNE 24-26, 2026

Key Educators Conference



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## Curing Lights in Focus

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### Conflict of Interest Statement

I created the split-tooth and MARC, but I am not associated with Ultradent or with BlueLight Analytics who sell MARC

**WELCOME TO**  
**The Dark Art of**  
**Curing Lights**



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**Teacher**



**Researcher**



**Prosthodontist**



Check me out :  
Google Scholar  
YouTube: PriceCuringLab  
QR Codes

rbprice@dal.ca

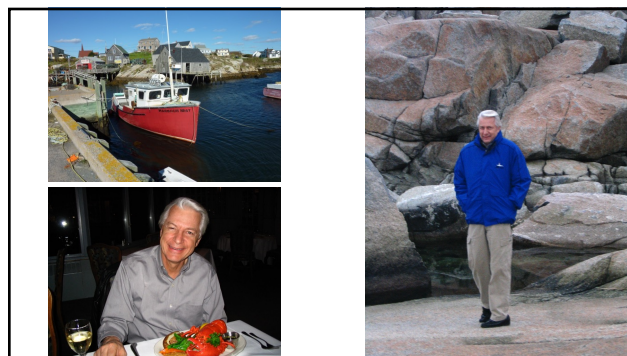
lcureviews.com

4

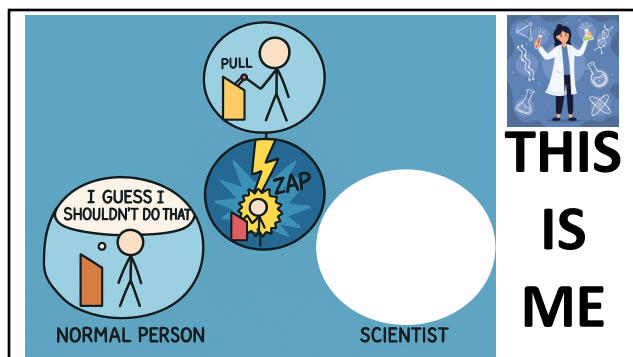
### I Trained At



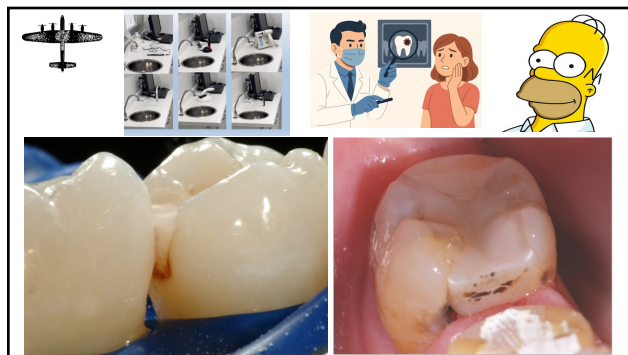
5



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## AGENDA

1. Light curing exercise #1
2. Introduction
3. The science
4. True costs
5. Light curing exercise #2
6. Conclusion

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## AGENDA

### Light curing exercise #1

1. Lift the cup
2. Check out the Class I composite
3. Left side of room, light cure for 10s
4. Right side of room, light cure for 20s
5. Check the top, does it feel hard?
6. Place it in front of you to be picked up

15

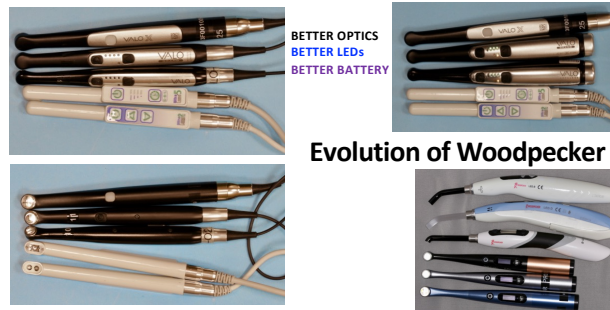
## MANY CHANGES IN 40 YEARS



UV CURING

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## Evolution at Ultradent



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**NONE are as Good as the Valo**



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**THESE ARE THE BEST LIGHTS**



Valo X

Valo Grand

Valo

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**VALO X is the BEST  
CURING LIGHT FROM  
ULTRADENT**

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Alibaba.com 390 Sold \$10 Deliver to: US English-USD Tax exemption

Medical devices & Supplies > Professional Medical Devices > Dental Equipments > Oral Therapy Equipments & Accessories

**Wholesale** Customization

FREE shipping capped at \$20

**1S Dental Curing Light Lamp Metal Head 1S Cure 4 Modes Wireless Dental LED Light Curing**

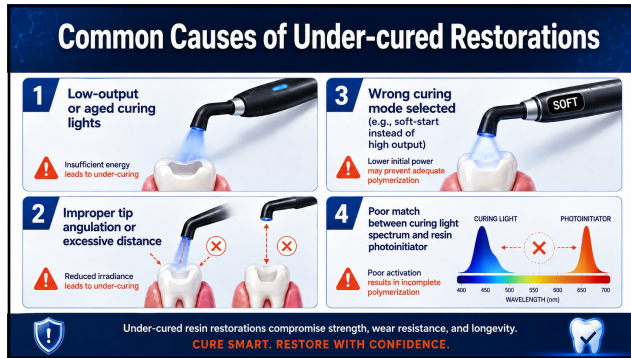
★★★★★ 5.0 (1 review) 390 sold #7 hot selling in Oral The...

**Lowest among similar**

|            |              |              |             |
|------------|--------------|--------------|-------------|
| \$10       | \$9.80       | \$9.50       | \$8.90      |
| 1-9 pieces | 10-49 pieces | 50-99 pieces | ≥100 pieces |

\*Taxes and import charges will be calculated at checkout

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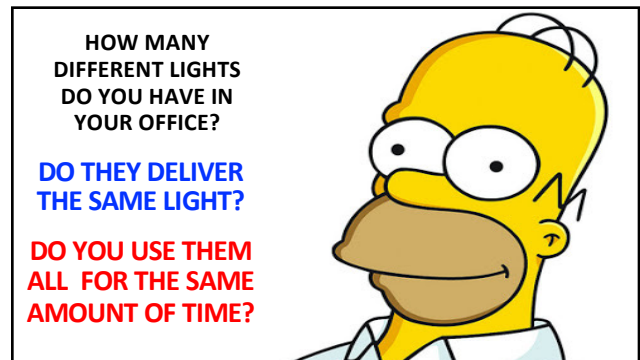
24



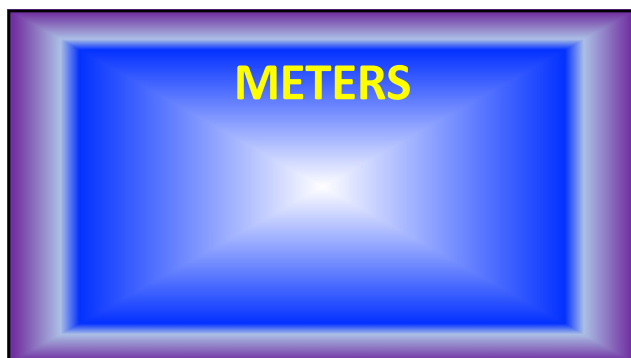
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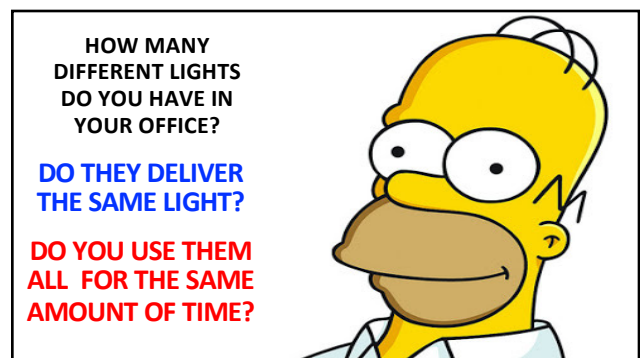
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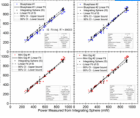


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RESEARCH ARTICLE  
Power output from 12 brands of contemporary LED light-curing units measured using 2 brands of radiometers  
Cristina Recanatini, Richard S. Price, Oliver A. Arns, Graham Sullivan

**BEST ON THE MARKET**



30

**BAKING WITHOUT CHECKING THE TEMP?**  
*What could possibly go wrong?*

- NO VERIFICATION. NO CONFIDENCE.
- POOR RESULTS. WASTED TIME.
- COSTLY MISTAKES. UNHAPPY PATIENTS.



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**Dental Curing Lights**  
In the USA, Curing Lights are Class II Medical Devices.

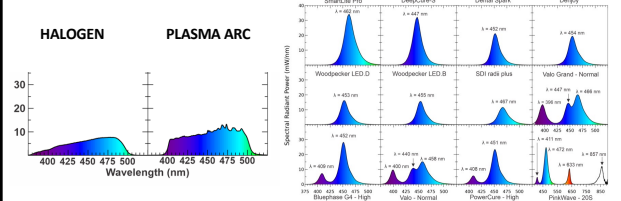


Dental Curing Lights - Premarket Notification (510K)  
www.fda.gov



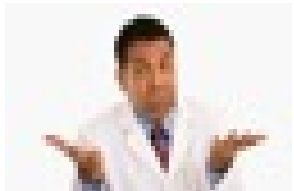
35

**THERE IS NO SINGLE EMISSION SPECTRUM**



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**You Can Only Test the Top**



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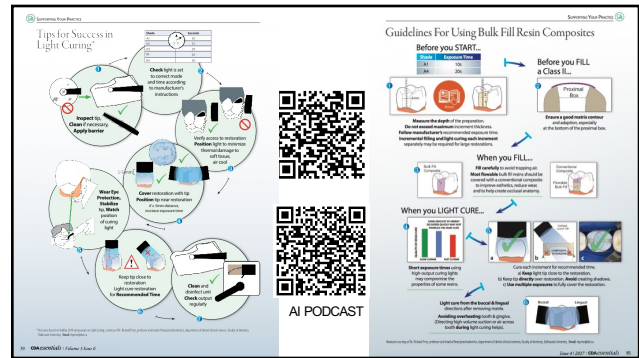
**GOOD LIGHTS ON THE MARKET: 2026**



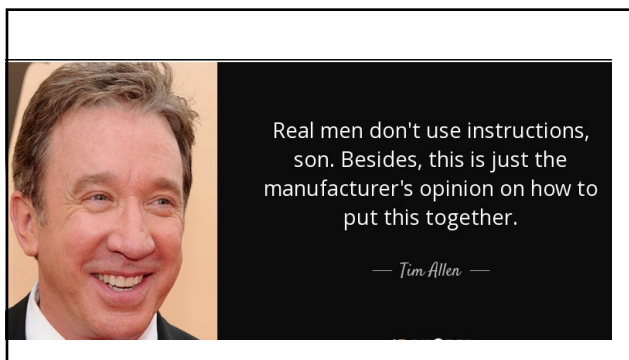
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41



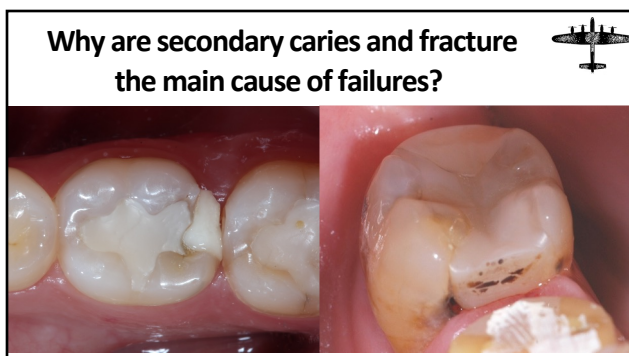
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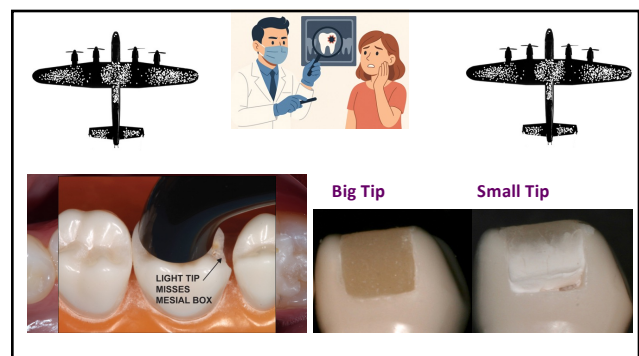
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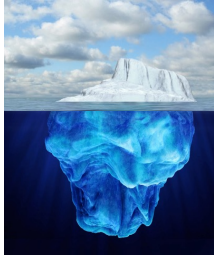


45



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## You Can Only Test the Top



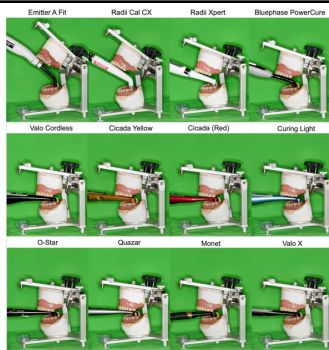
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## WHY IS THE VALO X THE BEST LIGHT ON THE MARKET? 2026



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## WHY IS THE VALO X THE BEST LIGHT ON THE MARKET? 2026



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## ERGONOMICS

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## BETTER ERGONOMICS



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## CAN YOU ACCESS THE RESTORATION WITH THE LIGHT?



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## CLINICAL REALITY

Light Design is **VERY** Important

**Valo has a low-profile head**



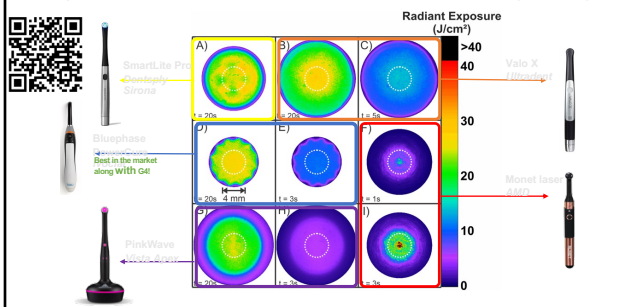
67

CHOOSE A  
LIGHT WITH A  
LOW PROFILE  
HEAD

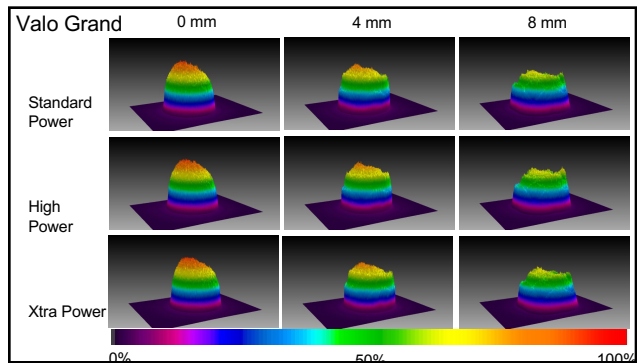


59

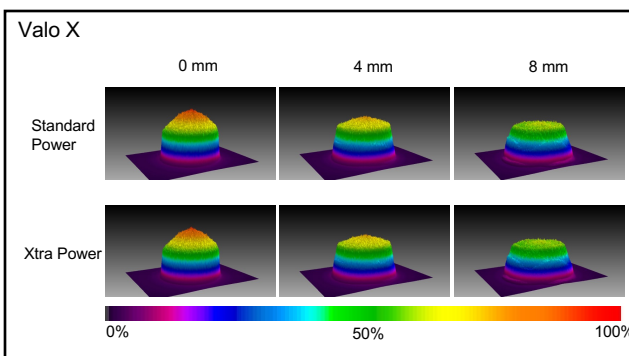
## Light distribution – an indication of quality



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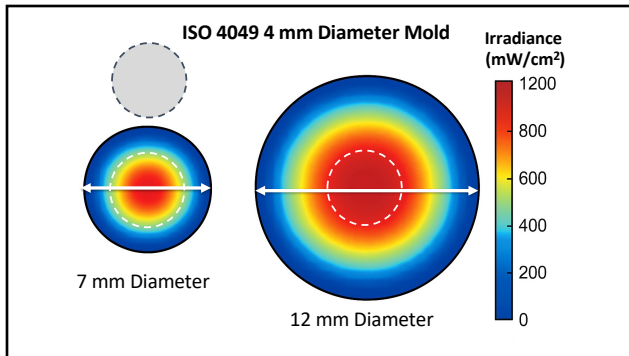
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**PROBLEM WITH ISO 4049:**

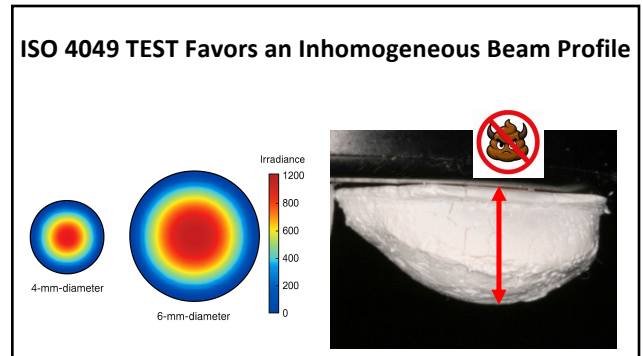
**Only reports maximum  
length**

64

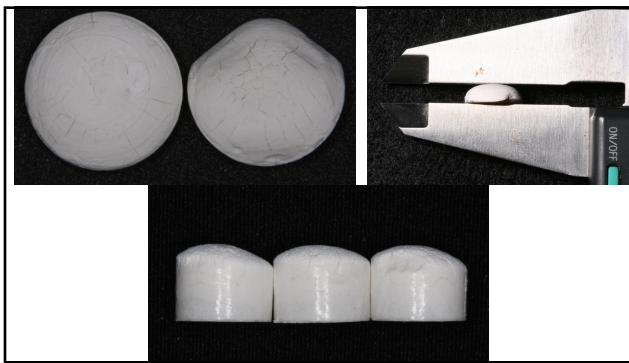




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66



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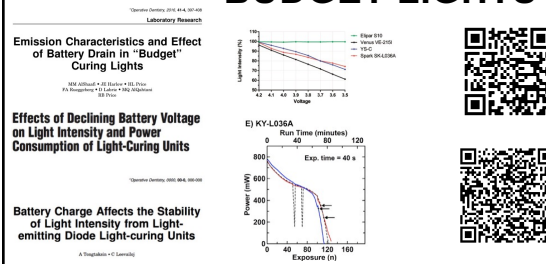
72

## WATCH OUT FOR COPIES



73

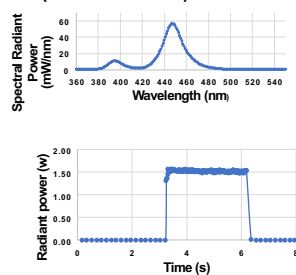
## BUDGET LIGHTS



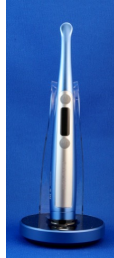
J Clin Orthod. 2017;51(7):411-418 Oper Dent. 2016;41(4):397-408

74

**Blue curing Light (turbo Mode) Sn: DOPC50088**  
(360 nm - 550 nm) 1566 mW

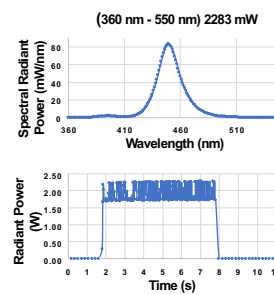


**INTERNAL TIP DIAMETER: 9.2 mm**



75

**Cicada Red (high) Sn: S3TRLT23F002**

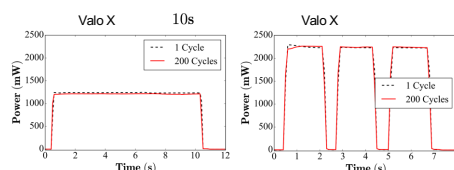


INTERNAL TIP DIAMETER: 8.7 mm



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## Valo X: ROCK STEADY



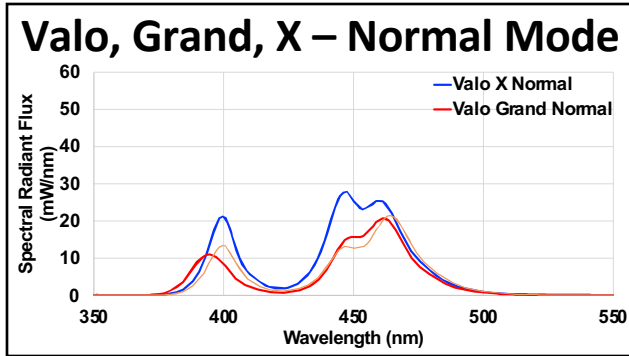
**200X**



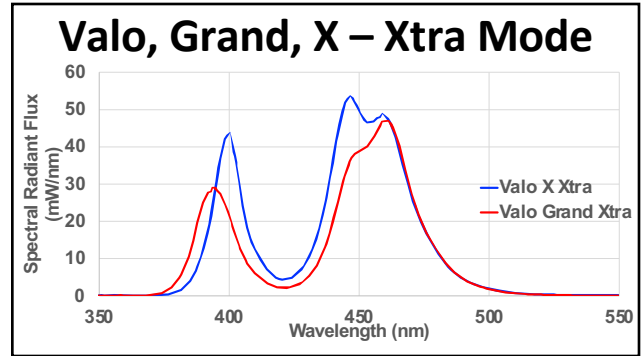
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| LCU               | Mode   | Exposure Time (s) | Average Power (mW) | Average Energy (J) |
|-------------------|--------|-------------------|--------------------|--------------------|
| <b>Cicada G5</b>  | Normal | 10                | 887                | 8.9                |
|                   | Turbo  | 5                 | 2000               | 10.0               |
| <b>Cicada G7</b>  | Normal | 10                | 516                | 5.2                |
|                   | Turbo  | 5                 | 1789               | 8.9                |
| <b>Valo X</b>     | Normal | 10                | 1319               | 13.2               |
|                   | Xtra   | 5                 | 2626               | 13.1               |
| <b>Valo Grand</b> | Normal | 10                | 880                | 8.8                |
|                   | High   | 5                 | 1505               | 7.5                |
|                   | Xtra   | 3                 | 2168               | 6.5                |
| <b>Monet +</b>    | Normal | 1                 | 2564               | 2.6                |

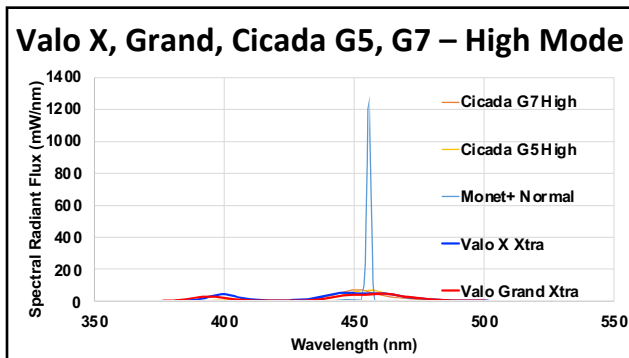
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### Has the Battery/Charger Been Approved?

Woman's headphone batteries exploded on flight to Australia, causing burns

The science behind exploding phone batteries

PHONE BATTERY EXPLOSIONS

Rising number of lithium battery incidents on airplanes worry pilots, flight attendants

85

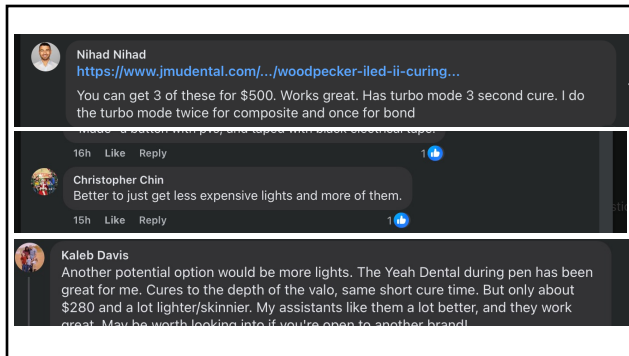


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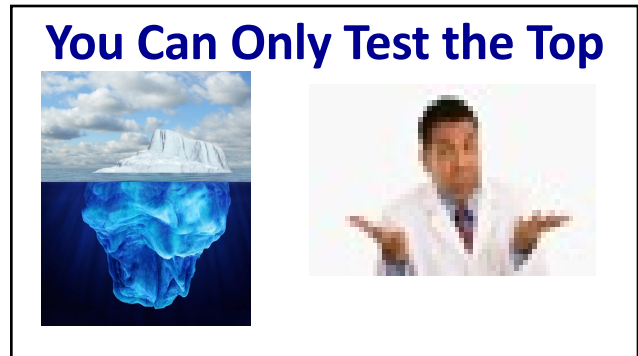
### Has the Battery/Charger Been Approved?

Battery Soldered to the Board

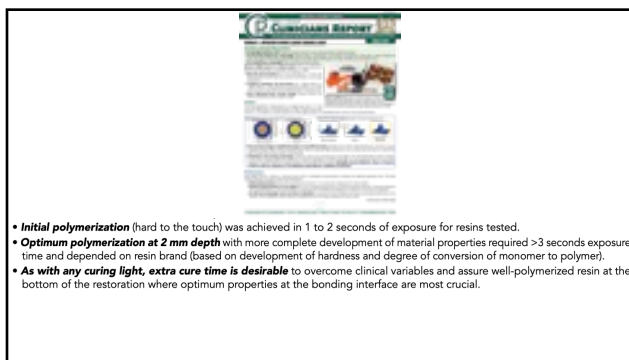
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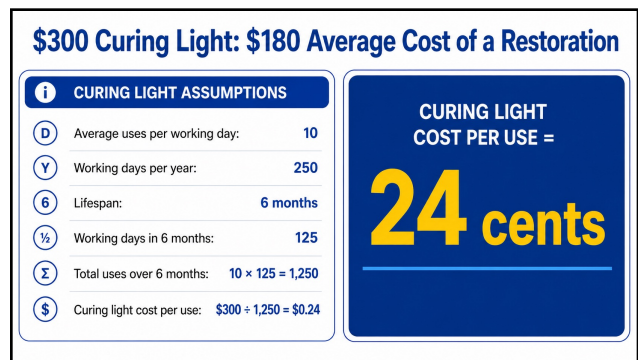
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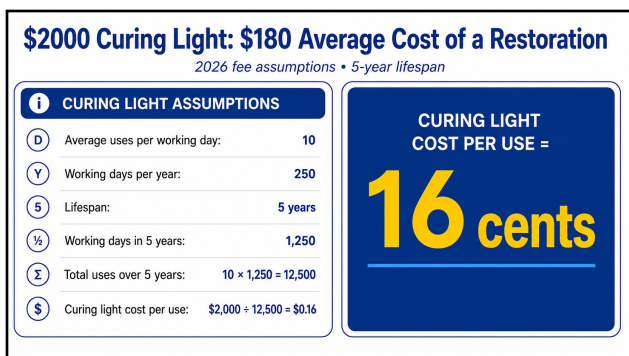
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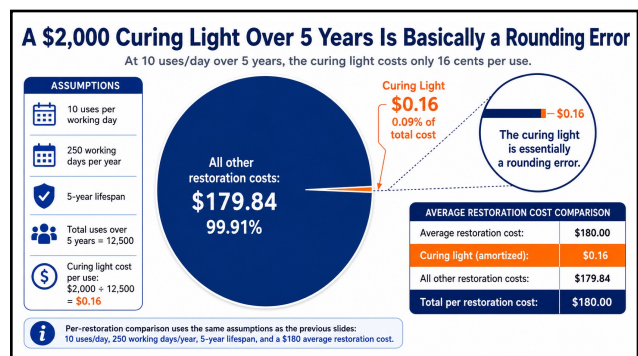
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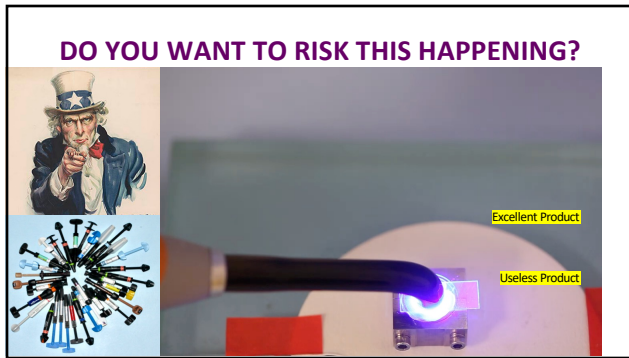


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## Problem: Batteries

- Sensitive to how they are used (NiMH)
- Take a long time to recharge (60-180 min)
- Lose capacity quickly
- Expensive to replace (up to \$435)
- When a curing light doesn't work DENTISTRY CAN'T HAPPEN

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## COST OF BATTERIES

2pcs GTL 16340 3.7V 2300mAh Rechargeable Lithium Batteries Red

4.8 (5) 1 customer review

Available from these sellers.

1 new from \$248.16

|  |                                                      |              |
|--|------------------------------------------------------|--------------|
|  | <b>Elipar DeepCure-S Li-Ion Battery Ea</b> (5843157) | 1 @ \$435.00 |
|  | <b>Demi Plus Battery Pack Ea</b> (1231435)           | 1 @ \$346.49 |
|  | <b>Bluephase Style Battery Ea</b> (9450403)          | 1 @ \$239.59 |

Ivoclar Vivadent (637692)

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## Battery Dies

### No Problem for Valo X

Optional Corded Operation

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**AS A KID, I USED TO WATCH THE WIZARD OF OZ AND WONDER HOW SOMEONE COULD TALK IF THEY DIDN'T HAVE A BRAIN. THEN I GOT SOCIAL MEDIA.**

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**Recipe Says:**  
**Bake for 30 minutes at 350° C**




**Dentist asks:**  
**Can I bake it in**  
**15 minutes at**  
**700°C / Cure my**  
**Resin in 1s?**



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**A One Second Light?**

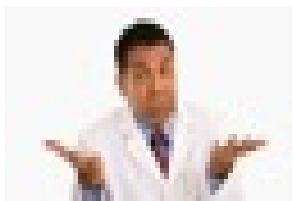


DocPort/Mac  
LED Intracanal Camera System

DentalMasterMindGroup.com

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**You Can Only Test the Top**

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**You Can Feel the Difference in the Composites you Cure With This Light**

A conversation about Vista Apex's PinkWave Curing Light with Mike Miyasaki, DDS

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| LCU        | Mode   | Exposure Time (s) | Average Power (mW) | Average Energy (J) |
|------------|--------|-------------------|--------------------|--------------------|
| Cicada G5  | Normal | 10                | 887                | 8.9                |
|            | Turbo  | 5                 | 2000               | 10.0               |
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|            | Xtra   | 3                 | 2168               | 6.5                |
| Monet +    | Normal | 1                 | 2564               | 2.6                |

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**FULL TANK: REACHES DESTINATION** ✓



**SUCCESS!**  
Reached the destination.

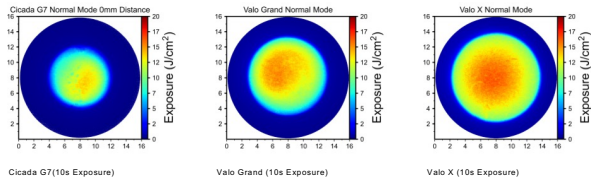
**HALF TANK: STARTS OK, BUT DOES NOT REACH DESTINATION** ✗



**FAILURE!**  
Ran out of fuel before reaching the destination.

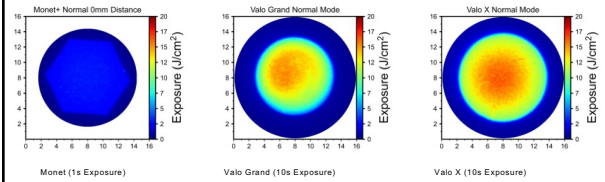
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Cicada G7, Valo Grand &amp; Valo X – Normal 0mm Distance



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Monet+, Valo Grand &amp; Valo X – Normal 0mm Distance



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**HOW HOT IS THE OVEN?****HOW POWERFUL IS THE LIGHT?**

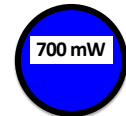
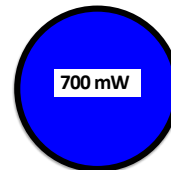
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**Irradiance ( $\text{W}/\text{cm}^2$ )**

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**SAME POWER: Active Diameter**9mm:  $63.6\text{mm}^2$ 6mm:  $28.3\text{mm}^2$  $\pi r^2$ **Irradiance****1,100  $\text{mW}/\text{cm}^2$** **2,476  $\text{mW}/\text{cm}^2$** 

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 **IRRADIANCE DOES NOT TELL YOU HOW POWERFUL A LIGHT IS**

**POWER/TIP AREA  
=  
IRRADIANCE  
(mW/cm<sup>2</sup>)**

**RADIANT EXPOSURE =  
IRRADIANCE X TIME (J/cm<sup>2</sup>)**




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## ANALOGIES

- **POWER:** HOW MUCH IS COMING OUT OF THE PIPE
- **IRRADIANCE:** IS THE WATER PRESSURE
- **ENERGY:** HOW MUCH WATER GETS INTO THE BUCKET EVERY SECOND





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**Irradiance (W/cm<sup>2</sup>)**  
**X**  
**Time (s)**  
**=**  
**Radiant Exposure  
(J/cm<sup>2</sup>)**





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## Do the Math

**A light emitting  
1,200 mW/cm<sup>2</sup> for 20 s will  
deliver 24 J/cm<sup>2</sup> of energy**



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## Do the Math

**To deliver 24 J/cm<sup>2</sup> of  
energy in 1 s the light must  
emit 24,000 mW/cm<sup>2</sup>**



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| POWER  | DIAMETER | AREA<br>cm <sup>2</sup> | IRRADIANCE<br>mW/cm <sup>2</sup> |
|--------|----------|-------------------------|----------------------------------|
| 1000mW | 12mm     | 1.13                    | 885                              |
| 1000mW | 10mm     | 0.79                    | 1266                             |
| 1000mW | 8mm      | 0.50                    | 2000                             |
| 1000mW | 6mm      | 0.28                    | 3571                             |
| 1000mW | 4mm      | 0.13                    | 7692                             |

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**Weight (Lbs or Kg)/Watts:**  
**Low Pressure/Irradiance**  
**High Pressure/Irradiance**



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**USE POWER SETTING**

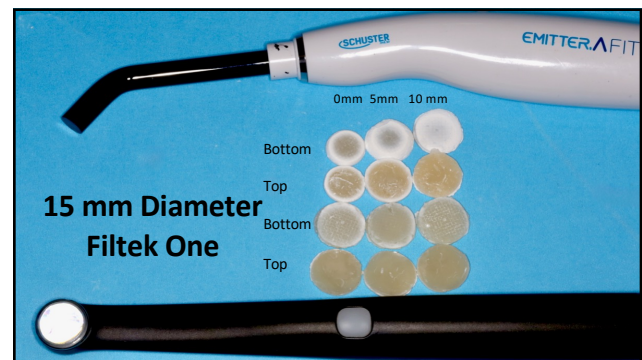


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**WHAT IS BEYOND THE TIP MAY NOT CURE AS WELL:**  
**AECTONE RESISTANCE TEST**

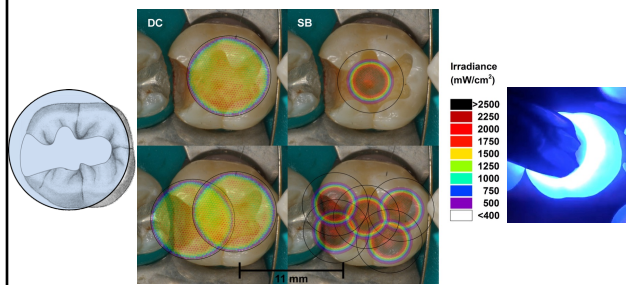


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**LARGE TIP vs. SMALL TIP**



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**WIDER LIGHT TIP**

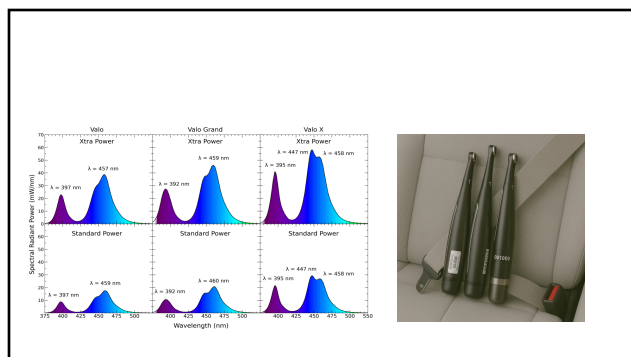


Valo X

Valo Grand

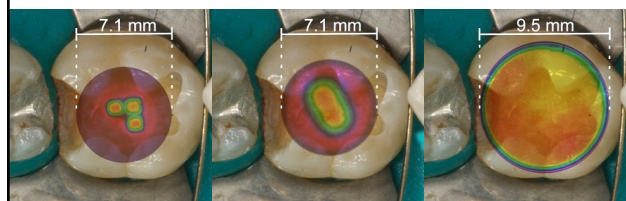
Valo

140



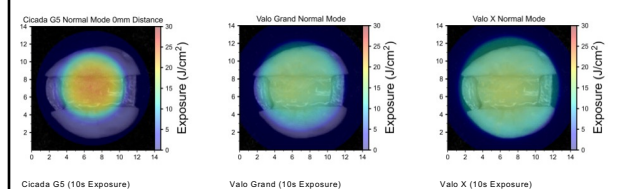
141

## Relate Beam Profile To Cavity Preparations



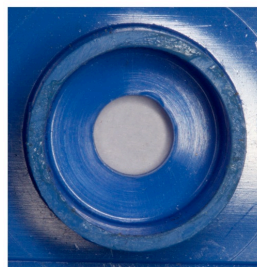
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## Cicada G5, Valo Grand & Valo X – Normal 0mm Distance

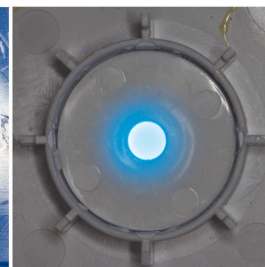


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## LED Radiometer 7 mm

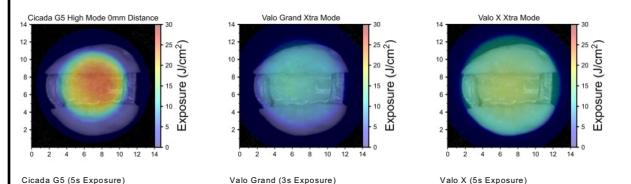


## SDI Radiometer 4.3 mm



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## Cicada G5, Valo Grand & Valo X – Xtra 0mm Distance



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## TECHNIQUE

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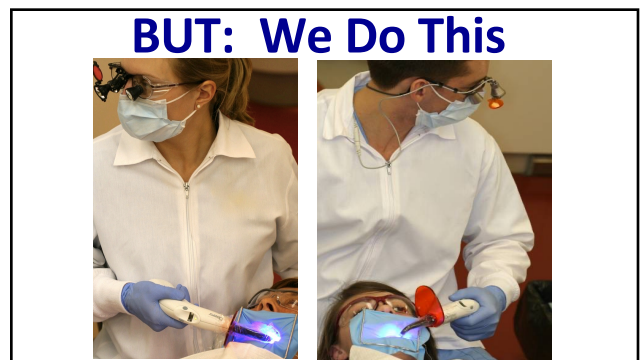
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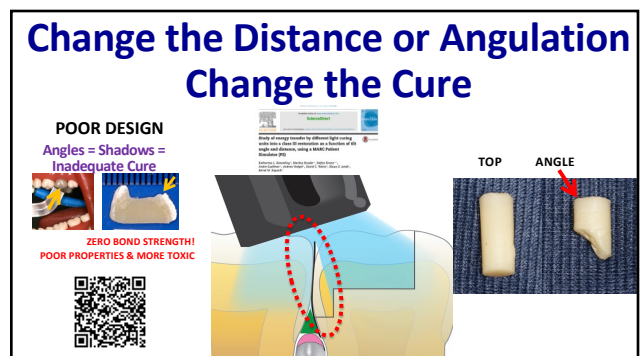
156



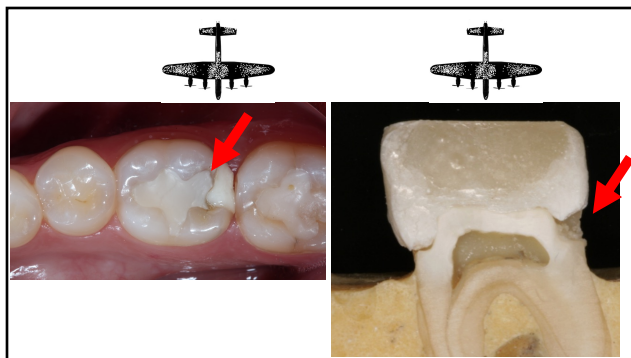
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Do You Want To Double  
Your Bond Strengths?  
**LIGHT CURE PROPERLY**  
Check out ALL the  
Bonding Research Papers

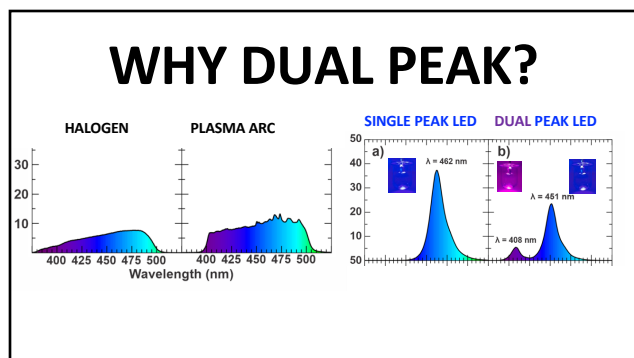
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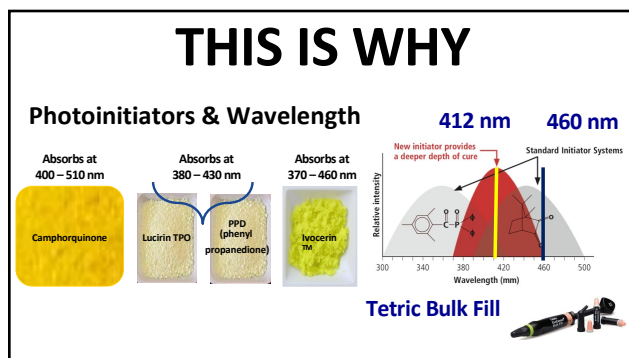
166



169

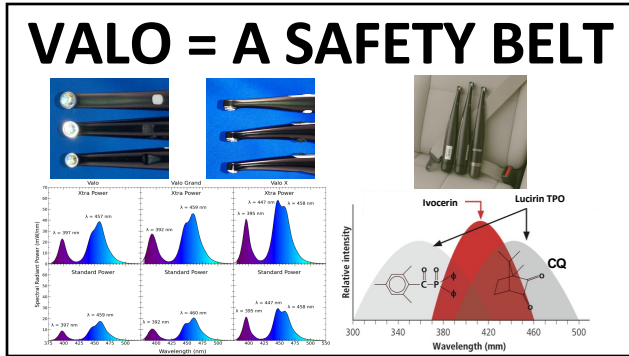


170

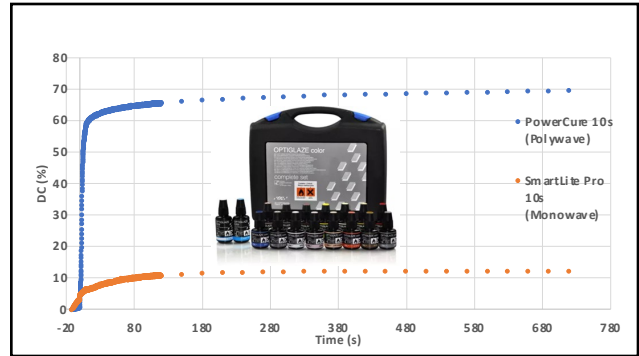


171





172



173

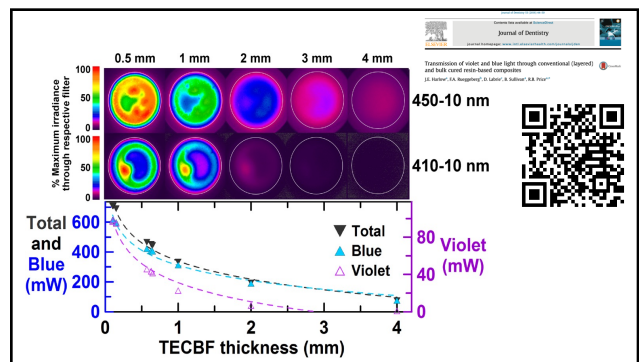
**OPTIGLAZE™ color**  
Light-Cured Characterization Coating for Composite & Acrylic Indirect Restorations

A revolutionary new material developed specifically to stain and glaze your composite, acrylic and PMMA type materials

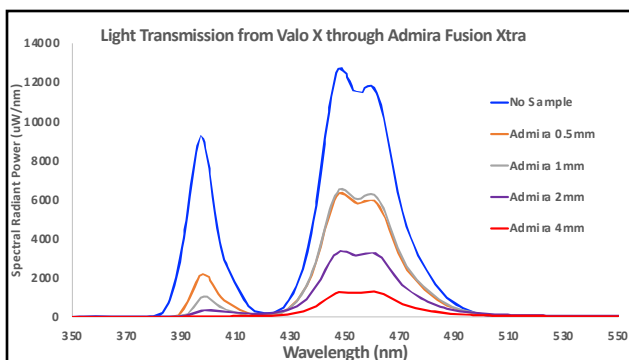
**Buy It NOW!**

|                                                                   |         |
|-------------------------------------------------------------------|---------|
| Halogen Light                                                     | 40 sec. |
| Plasma Arc                                                        | 8 sec.  |
| LED Light (with light source having wavelength lower than 430 nm) | 40 sec. |

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## Common Causes of Under-cured Restorations

- Low-output or aged curing lights**  
Insufficient energy leads to under-curing
- Improper tip angulation or excessive distance**  
Reduced irradiance leads to under-curing
- Wrong curing mode selected (e.g., soft-start instead of high output)**  
Lower initial power may prevent adequate polymerization
- Poor match between curing light spectrum and resin photoinitiator**  
Poor activation results in incomplete polymerization

Under-cured resin restorations compromise strength, wear resistance, and longevity.  
**CURE SMART. RESTORE WITH CONFIDENCE.**

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**Thank You**

Prof. Jack Ferracane  
Prof. Howard Strassler  
Prof. Daniel Labrie  
Prof. Fred Rueggeberg  
Dr. Cristiane Maucoski  
Prof. Marcelo Giannini  
Prof. Cesar Arrais  
Prof. Carlos Soares  
Dr. Thorsten Bock (Ivoclar)  
Dr. Benjamin Gebhard (Ivoclar)  
Dr. Joe Oxman (3M)  
Dr. Frank Pfefferkorn (Dentsply Sirona)  
Neil Jessop (Ultradent)

**CANADIAN BBQ**

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*QUESTIONS*

YouTube: PriceCuringLab  
email: rbprice@dal.ca

DALHOUSIE UNIVERSITY  
Inspiring Minds

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**AGENDA**

1. Light curing exercise #1
2. Introduction
3. The science
4. True costs
5. Light curing exercise #2
6. Conclusion

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**An Injection Molded Tooth to which Composite Does Not Stick**

QR Code

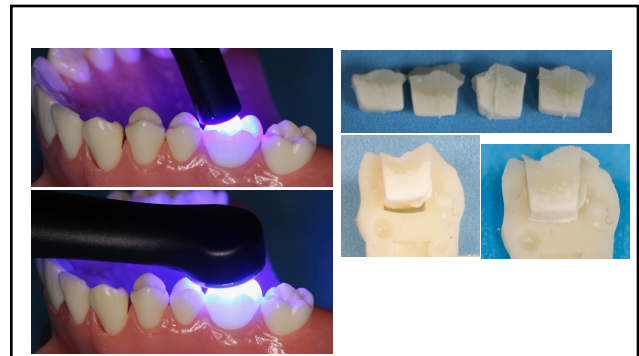
186

**6 mm Deep:**  
**ISO: 4mm/2 and 8mm/2**  
**Good for 2 increments of regular or one increment of bulk**

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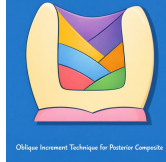
188



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## AGENDA

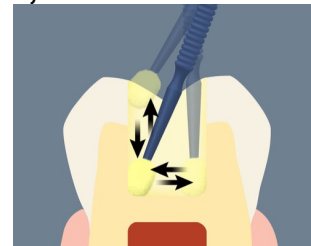
1. Bond, scrub 10s
2. Air dry, gentle stream for 10s
3. Light Cure 10s
4. Fill with Forma
5. Light Cure 10s
6. Open and inspect



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## AGENDA

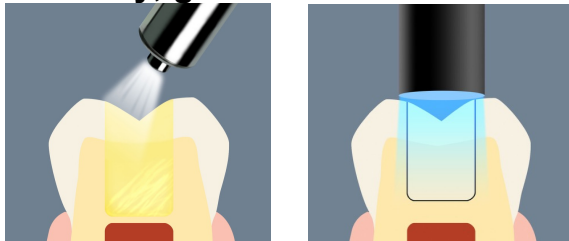
1. Bond, scrub 10s



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## AGENDA

1. Air dry, gentle stream for 10s



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## AGENDA

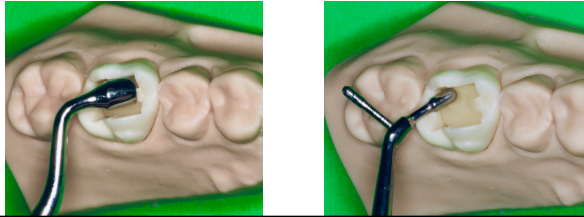
1. Fill with Forma
2. Light Cure 10s



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## **AGENDA**

### **1. Fill with Forma**



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## **AGENDA**

### **1. Open and inspect**



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**If this split tooth interests  
you, contact me at**

**rbprice@dal.ca**

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