Curing Lights

Photochemical Catalyst

- CQ - 380 to 510 nm (465)
- Phenyl-propanedione (PPD) - 330 to 490 nm (390)
- TPO - 350 to 430 nm (375)

Highest absorption is below 400 nm

"CQ + PPD can act synergistically to increase monomer conversion to polymer and/or reduce the photosensitiser concentration and hence the color"
Curing Lights

- Halogen (QTH): 390 through 510 nm
- LED: 430 through 510 nm

2100 mw/cm²
Effect of Distance on Irradiance and Beam Homogeneity from 4 Light-Emitting Diode Curing Units

Richard B. Price, BDS, DDS, MS, PhD; Daniel Labrie, PhD; J. Marc Whalen, PhD; Christopher M. Felix, BSc. J Can Dent Assoc 2011;77:b9

Data Courtesy of Dr. Richard Price
Dalhousie University, Halifax, NS, Canada.

- Intensity pattern reflects the map of composite micro-hardness
- Better cure with the most uniform light pattern
A focused beam allows the optimum intensity.
- Maintain a soliton-like beam shape that concentrated the energy in the center beam.
- Minimum intensity degradation within a 10mm depth of focus through optimum beam waist for class II.
- Most efficient optical conversion for composite cures.

An ADA Laboratory Evaluation of Light-Emitting Diode Curing Lights
November 01, 2014

Light-Curing Units: A Review of What We Need to Know
R.B. Price, J.L. Parmacek, G. and A. Shertok

Abstract
The primary consideration for delivering consistent and reliable light output from a light-curing unit (LCU) is the design and performance of the light-emitting diode (LED) diode array. It is important for dentists to understand the basics of LED technology and output curves, and to use this information to assist in the selection of the most effective light-curing units for their patients. This is particularly important for dental professionals in the United States, who are required to have a complete understanding of the International Organization for Standardization (ISO) standard ISO 15693, which sets the minimum requirements for LCU efficiency. This article provides a comprehensive review of the LED technology and output curves of various LCU models, and discusses the relationship between light output and curing efficiency. The article also highlights the importance of using the correct LCU for each type of composite resin, and the importance of maintaining and calibrating the LCU for optimal performance. The article concludes with a discussion of the potential long-term effects of using an incorrect LCU on the performance of the composite resin and the patient's oral health.
Fusion Light by Dentlight

LED Curing Light Head (420-490 nm)
Violet Light Head - providing violet light (390 – 430 nm)

for curing of lower wavelength initiator adhesives (e.g. TPO) and composite visualization/removal.

The “Take Away”