



The
COMPEX HDTM
HEATED DISPENSER

Improving Restorative Results and Protocols

eBook by



*Advancing Dental
Excellence*



INTRODUCTION:

Although there have been significant advancements in materials and techniques, the placement of composite restorations has not seen the expected improvements. This is due to the physical and mechanical properties of the composite material itself. However, by implementing new techniques and protocols into the practice, it is possible to achieve the desired results.

Extensive research has confirmed the remarkable benefits of utilizing heated composite, resulting in enhanced restorative outcomes and exceptional final results.

AdDent, Inc., the foremost authority on warming composite has re-envisioned composite delivery with the **Complex HD** Heated Dispenser. This innovative device uses the latest PTC technology to rapidly warm even heavily filled compules.

CHAPTER 1:

How Heated Composite Improves Restorative Outcomes

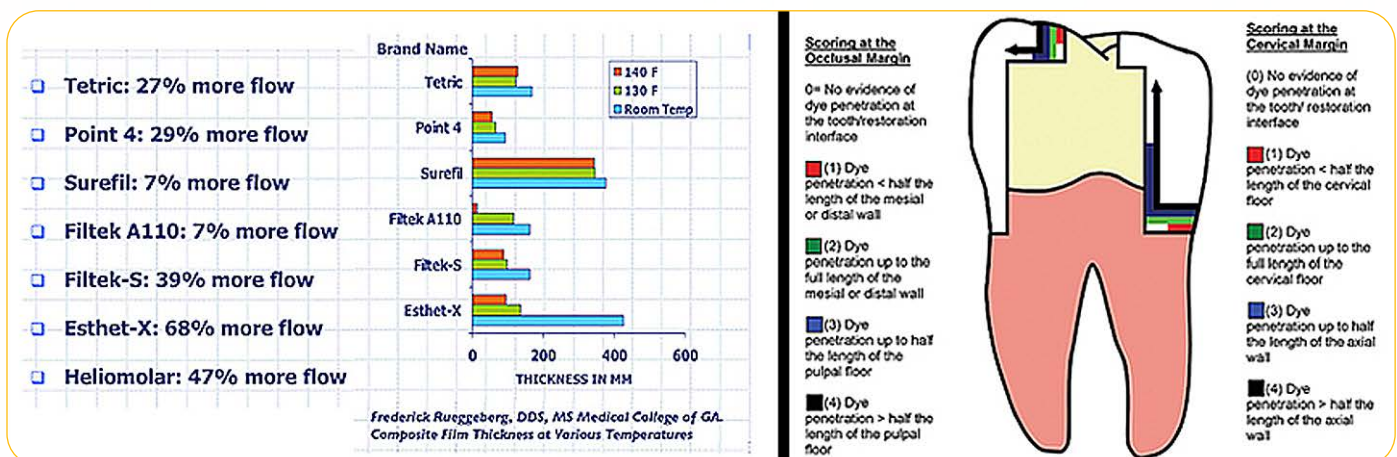
With the continuous advancements in composite resin technology, the handling of composites has become increasingly demanding. These enhancements have resulted in products that are significantly stiffer than their predecessors, posing a challenge for clinicians.

Over the past 20 years, heating composites to assist clinicians in restorative protocols has become widespread.¹ AdDent, Inc., has a legacy of pioneering cutting-edge heating technology that enhances clinical outcomes and offers a reliable and effortless method for placing composite restorations.

By using composite heating technology and the latest composites, you can enjoy enhanced characteristics with effortless placement and manipulation. Pre-heating significantly reduced the viscosity of highly viscous resin composites. Stickiness, measured as unplugging, is generally improved with elevated temperatures.^{1,2}

Utilizing heated composite in place of a flowable liner significantly reduces the risk of secondary caries due to micro-leakage. Additionally, preheating the composite has been proven to be an effective method of reducing microleakage in the more delicate cervical margins.³

Achieving optimal adaptation and reducing the total gap surface area in resin composite can be accomplished by preheating it to 155°F.⁴ Research has shown that pre-warmed composite materials have superior adaptation, fewer voids, and higher strength compared to composite materials that were not pre-warmed.⁵



CHAPTER 1:

How Heated Composite Improves Restorative Outcomes

Using heated composite offers clear advantages that significantly enhance your restorative outcome.

BENEFITS OF HEATING COMPOSITE:

- Increases its flow and reduces its thickness. Allowing it to be used in place of flowable composites.
- Adapts better, reduces gaps, voids, and microleakage, and demonstrates less stickiness.
- Increases monomer conversion with shorter cure times
- Reduces cure time and increases the depth of cure
- Increases micro-harness and reduces shrinkage stress
- Enhances the color stability of composites

FEATURE	BENEFIT OF HEATING	REFERENCE (more available on website)
Flowability/Film Thickness	Heating composite increases flowability and reduces thickness.	J. C. Broome 2006
Viscosity (Flow) and Stickiness	Heated composite showed viscosity comparable to flowables while demonstrating less stickiness.	N. Loumprinis, E. Maier, R. Belli, A. Petschelt, G. Eliades, U. Lohbauer 2020
Micro-Harness	Heating composite increases micro-harness and flowability, resulting in easier placement and greater monomer conversion.	K.V. Ayub, A.S. Rizkalla, L.F. Pegoraro, M.C. Santos
Voids	Heated composite enhanced the handling characteristics improved adaptation and reduce voids.	K.H. Bolding, A.E. Hill, D. Tantbiroj, A. Versluis 2023
Gap Formation	Heated composite increased adaptation and reduced gap formation.	N. Choudhary, S. Kamat, T.M. Mangala, M. Thomas 2011
Micro-Leakage	Heated composite has significantly less micro-leakage compared to the flowable liner. Reducing the risk of secondary caries.	W.C. Wagner, M.N. Asku, A.L. Neme, J.B. Linger, F.E. Pink, S. Walker 2008
Degree of Conversion	Monomer conversion is significantly increased with shorter cures times, when composite is heated.	M. Daronch, F.A. Rueggeberg, M.F. Degose 2005
Depth of Cure and Polymerization Properties	Heated composite increased the monomer conversion rate, depth of cure and surface hardness with shorter cure times.	C. Munoz, P.R. Bond, J. Sy-Munoz, D. Tan, J. Peterson 2008
Shrinkage/Shrinkage Stress	Heated composite allows for reduced curing time and lower polymerization stress while maintaining or increasing degree of conversion.	F.C. Calheiros, M. Daronch, F.A. Rueggeberg, R.R. Braga 2014
Color and Stability	Heating will not change the color of composite materials and enhances its stability. Heating the composite resin is effective in the reduction of color change after long time immersion in coffee solution.	F. Darabi, A. Seyed-Monir, S. Mihandoust, D. Maleki 2019
Pulp Temperature	There is no significant increase of pulpal temperature when using heated composite.	M. Daronch, F.A. Rueggeberg, R.G. Holmes, L. Moss, M.F. DeGoes 2007
Cementation of Crowns and Veneers	The use of heated composite as a luting cement for inlays and onlays can be recommended, it showed less linear shrinkage and polymerization force. Concerns about seating due to viscosity are not justified.	P. Magne, M. Razaghy, L.M. Soares 2018
Bonding and Adhesion	Heated composite demonstrated higher flexural strength and adhesion to dentin.	M.R. Kramer, D. Edelhoff, B. Stawarczyk 2016
Repeated Heating	Reheating or extended heating of composite does not effect monomer conversion values.	M. Daronch, F.A. Rueggeberg, L. Moss, M.F. DeGoes 2005
Physical Properties	Heating composite did NOT alter the mechanical properties but provided enhanced adaptations to the preparation wall.	N.R. Froes-Salgado, L.M. Silva, Y. Kawano, C. Francci, A. Reis, A.D. Loguercio 2010
Water Sorption/Solubility	Higher temperatures and shorter cure times of heated composite led to lower sorption and solubility values.	F.L.A. de Castro, B.B. Campos, K.F. Bruno, R.V. Reges

Research References noted are available at www.addent.com

CHAPTER 2:

How **Complex HD** Enhances Protocols

The **Complex HD** heated dispenser is a useful tool that allows you to easily warm up composite materials. It provides the same benefits as the Calset composite warmer but is more convenient. In less than a minute, it heats the composite compule to the ideal temperature of 155°F and subsequent compules even faster. By maintaining the optimal temperature throughout the entire procedure, it delivers the benefits of heated composite materials directly to the restoration area.

This device allows practitioners to perform restorative protocols quickly and effectively, reducing the occurrence of gaps, micro-leakage, voids, and shrinkage stress. This saves both time and costs by avoiding the need for redoing the procedure. It also reduces tooth sensitivity and prevents future issues for the patient.

Moreover, the **Complex HD** is highly versatile and can fit most brands of composite compules. It enhances posterior bulk fills and traditional incremental layering techniques. The use of heated composite for the placement of veneers, onlays, and overlays resolves the issues created by using luting cement.

Incremental Layering



Two Layer Bulk Fill



Single Layer Bulk Fill



COMPLEX HD™

Will Enhance Placement for Any Protocol

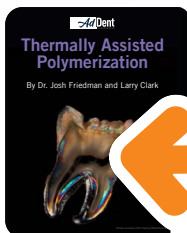
CHAPTER 3:

What are the results of heating composite with the **Complex HD**

Complex HD's heating technology significantly enhances the flow characteristics of highly filled composites, while also improving polymerization and increasing the depth of cure, no matter what type of curing light you use.

Heating composite material decreases its viscosity, which makes it easier to flow and conform to preparation walls. This leads to fewer voids and micro-leakage, which in turn reduces the chances of secondary caries and restorative failures.⁶ Additionally, heating the composite material enhances its physical and handling properties, while improving its color stability.

- Able to quickly heat composite material to 155°F
- Warming composite significantly lowers the viscosity of the material, resulting in better adaptation, reduced voids, gaps, and microleakage
- Reduces cure time and increases the depth of cure
- Increases micro-hardness and reduces shrinkage stress
- Reduces the incidences of secondary caries and sensitivity
- Materials remain highly sculptable, non-sticky, and easily shaped

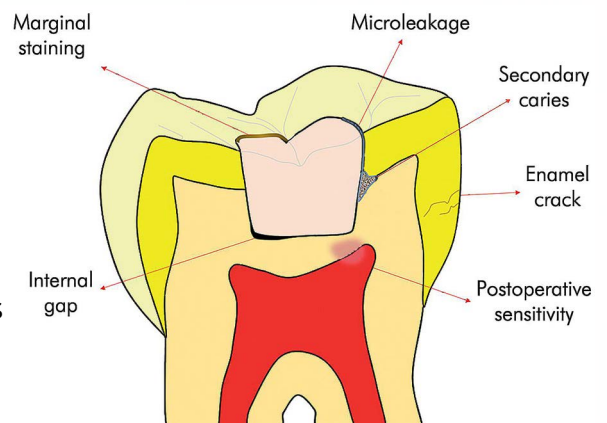


Learn more about
Thermally Assisted Polymerization

DOWNLOAD OUR FREE EBOOK

Using the **Complex HD** to heat composites results in stronger and more durable restorations. This reduces the chances of secondary caries and restorative failures, ensuring a successful procedure and satisfied patients.

Heating composites with the **Complex HD** allows for stronger, longer-lasting restorations and reduces the risk of secondary caries and restorative failures. Ensuring a successful procedure and delighted patients.⁶



CHAPTER 4:

Conclusion

Experience greater efficiency in your restorative procedures with the **Complex HD** Heated Dispenser for composite protocols. This instrument places all the benefits of heated composite in your hand, allowing for direct delivery to the restorative area.

Quick heating of the compules and easy delivery of the composite optimize all restorative procedures for improved results. Heating composite has been researched and proven to improve composite properties and improve the practitioner's experience when using heavily filled composites.

Durable dental restorations that are free from side effects like tooth sensitivity or secondary caries can significantly benefit patients. Furthermore, the use of such restorations can also greatly reduce the cost of redoing procedures.

COMPEX HD HEATED DISPENSER:

Includes: Complex HDTM (1) dispenser, (10) silicone sleeves, (25) barrier bags, and (1) medical grade charge with USB cord

FEATURES:

- Light weight handheld rechargeable device.
- Heats a broad range of compules
- Heats compules to 155°F (68°C) in 40 seconds
- Heats up to 100 compules without recharging.
- Easy to load and unload with patented ejector mechanism.
- Silicone sleeve seals compule orifice.
- Barrier bag covers entire handle.

BENEFITS:

- Comfortable all in one heater and dispenser – saves space, easily moved room to room.
- Heats composite compules currently on the market.
- Delivers all compules without temperature loss.
- Charge no more than once per week under normal use.
- Fast compule insertion and removal saves time.
- Autoclavable silicone sleeve covers the entire length of compule and heater for ideal asepsis.

Complex HD References:

1. Heating and preheating of dental restorative materials – a systematic review – L. Lopes, R. Terada, F. Tsuzuki, M. Giannini and R. Hirata

<https://addent.com/wp-content/uploads/2021/01/HeatingAndPreheatingOfDentalRe-LCP-Lopes-RSR-Terada-FM-Tsuzuki-M-Giannini-RHirata.pdf>

2. Viscosity and stickiness of dental resin composites at elevated temperatures - Nikolaos Loumprinis, Eva Maier, Renan Belli, Anselm Petschelt, George Eliades, Ulrich Lohbauer

https://www.addent.com/wp-content/uploads/2021/01/Viscosity-stickiness-of-dental-resin-composites-at_N-Loumprinis_E-Maier_R-Belli_A-Petschelt_GEliades_ULohbauer-elevated-temperatures.pdf

3. Effect of Pre-heating Resin Composite on Restoration Microleakage - WC Wagner, MN Asku, AL Neme, JB Linger, FE Pink, S Walker

https://www.addent.com/wp-content/uploads/2017/04/Effect-of-Pre-heating-Resin-Composite-on-Restoration-Microleakage_Wagner-Walker.pdf

4. Effect of pre-heating composite resin on gap formation at three different temperatures- Nilabh Choudhary, Sharad Kamat, TM Mangala, and Mohan Thomas

<https://www.addent.com/wp-content/uploads/2017/04/Effect-of-pre-heating-composite-resin-on-gap-formation-at-three-different-temperatures.pdf>

5. Prewarming effect on adaptation, porosities, and strength of a composite resin- K.H. Bolding, A.E. Hill, D. Tantbirojn, A. Versluis

<https://www.sciencedirect.com/science/article/abs/pii/S1751616123002667>

6. Thermally Assisted Polymerization – Joshua Friedman, DDS & Larry Clarke

https://www.addent.com/wp-content/uploads/2022/03/Ebook_What-is-Thermally-Assisted-Polymerization_JF_LC.pdf