Thermafil®

CLINICAL HINTS

Compiled by Dr. Gavan O’Connell
M.D.Sc (Melb) L.D.S. (Vic)

MAILLEFER

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Thermafil is a patented endodontic obturator consisting of a flexible central carrier that is uniformly coated with a layer of refined and tested “alpha phase” gutta-percha. When heated, the “alpha phase” gutta-percha becomes sticky and tacky, with excellent flow characteristics and obturates the canal and available lateral and accessory canals.

The Thermafil carrier is a flexible 25mm biocompatible radiopaque plastic material with a .04 taper.

Successful endodontic treatment begins with proper canal access, debridement, and cleansing and shaping. Unless these procedures are carried out thoroughly, and an effective coronal seal is used, success cannot be guaranteed irregardless of obturation technique. Please refer to “Maillefer Profile® and ProTaper™ Clinical Hints” for recommendations on canal preparation. Note also that the Thermafil technique can be used after canal preparation with conventional files used in a step-back technique.

The Thermafil technique was first introduced in the late 1980s, and the clinical studies have compared favourably to the Lateral Condensation technique. The greatest feature of Thermafil is that it is so quick and easy to learn. No longer is there the need to use lateral spreaders and multiple accessory gutta-percha points.

An instructional video is also available. Contact your local Dentsply Territory Manager for more details.
This is generally necessary because the insertion of the Thermafil obturator creates a slight apical pressure that can cause some discomfort. Rather than have the possibility of the patient experiencing pain during obturation, it is preferable to administer anaesthesia beforehand.

After cleansing, debridement and shaping, confirm final working length using an appropriate Thermafil verifier that reaches the apical constriction passively with no significant resistance or twisting. Because the Thermafil nickel titanium verifiers are fluted, a tight-fitting verifier can be made to fit passively with a few rotations, if necessary.

Select a Thermafil obturator the same size as the “best fitting” verifier previously selected.

Disinfect the obturator in 5.25% sodium hypochlorite solution for one minute. Rinse it in 70% alcohol, then leave to air dry for several seconds to allow evaporation of excess alcohol.

As the obturator dries, mix the root canal sealer. We recommend using AH Plus™ or AH26®. These sealers are biocompatible and have properties that allow for excellent lubrication and adhesion, ample working time, and long-term stability.
Obturation Procedure
A Quick Guide (continued)

6 Heat the obturator in the Thermaprep® Plus Oven

See “instructions for operation” on page 5 & 6.

7 Dry canal and apply sealer

Before applying sealer, thoroughly dry the canal, then place a very small amount of sealer on a paper point or file and distribute a light coating evenly along the canal walls. Excessive sealer is neither necessary nor desirable for this technique. However, sealer is mandatory.

8 Obtain canal(s)

Using firm (straight-line) apical pressure (no twisting or rotating), insert the Thermafil obturator into the canal to the previously determined working length. Do not force the carrier beyond working length or twist it during insertion.

9 Remove shaft and handle

Stabilise the carrier with your index finger and sever the shaft level with the orifice using a suitable Prepi® bur or an appropriate high-speed round bur. Note that extreme care needs to be taken if attempting to sever the shaft with a flame heated instrument. The instrument may cool too rapidly and cause inadvertent obturator displacement from the canal. Use a suitably sized plugger for extra vertical condensation. If required, an accessory gutta-percha point may be used.

10 Post space

For best results in creating post space, use the Pro-Post® eccentric tip drill. Many of the well-known post drills have a non-cutting tip and are ineffective in creating post space for Thermafil.
Thermaprep® Plus Oven
Instructions For Operation

1. Connect the oven to 240V mains voltage and turn the oven on with the switch at the back. The green stand-by light should illuminate.

2. Put both slide-holders in the upper position by pressing the back of the holder (arrow up). Gently ease it up with your finger.

3. Place the Thermafil obturator in the left slide-holder. The rubber stop needs to be under the holder.

4. Push the holder down (arrow down) until it clicks. Do not use excessive pressure or attempt to push the slide-holder down using the back of the holder (i.e. the arrow up part).

5. Push the button that corresponds with the obturator you have selected e.g. size 20–25. Now push the button with “start left”. The obturator is being heated. Depending on size of Thermafil obturator selected, the warming up time varies from approximately 15 to 35 seconds and is regulated automatically.

continued overleaf....
After the first signal (beep) the obturator is ready for use. Gently ease the slide-holder up (arrow up). Take the obturator out of the holder in a forward direction and not up.

If you are not ready for the obturator at the first beep then leave it in place. The oven will keep the obturator at the right temperature and ready for use for the next 2 minutes. Every 15 seconds, during this 2 minute period, the oven will beep to remind you that the **Thermafil** is ready for use.

After 2 minutes the **Thermaprep**® oven switches off automatically.

When you have taken the obturator out of the holder, you can switch off the **Thermaprep**® oven by pushing the start button again. During the warming-up cycles you cannot interrupt the process.

If you want to heat more obturators, you can vary the use of the left and the right slide-holder so you can go on with your work efficiently. After the first beep you can immediately use the other slide-holder.
Frequently Asked Questions

Is Thermafil available with non-plastic carriers?

No. Maillefer only produces plastic carriers.

Must I use the oven to heat the Thermafil?

Yes, this is mandatory. Thermafil plastic carriers should never be heated with a flame.

Are Thermafil obturators sterilised?

Strictly speaking, gutta-percha is not “sterilised” through and through; it is disinfected. The instructions explain a recommended procedure for disinfection prior to use which is very effective in killing vegetative microorganisms and spore forms.

How important is complete drying of the canal?

Very important. Moisture in the canal can contaminate the sealer to ineffectiveness, and “wet” the dentine causing impaired adherence of sealer and gutta-percha. Moisture “pushed” into the periapex during canal obturation has been linked as a possible factor in post-operative pain.

Does Thermafil require sealer?

Yes – for two reasons. First, it provides lubrication for the thermoplasticised mass as it proceeds apically down the canal during insertion, and second, it provides an adhesive micro-interface between the gutta-percha and dentinal wall. Research has shown gutta-percha obturations to be sealer dependent.
Frequently Asked Questions

What is the recommended sealer quantity?

Q
A
Place a small amount of sealer on a paper point and distribute evenly, as a light coating, along the canal walls. This has been shown to reliably produce a micro-thin, uniform sealer interface between the gutta-percha and dentine.

How do I fill a canal that is longer than 25mm.? 

Q
A
Plastic carriers are designed with this situation already in mind. The measurement calibrations are set at 18, 19, 20, 22, 24, 27 and 29mm. Larger than this simply notch the handle at the required length.

Must I change my instrumentation technique?

Q
A
No. Normal preparation with hand, mechanical or a combination of these methods is acceptable. The important feature to remember is to use the obturator that corresponds to the verifier of best fit – (which will not necessarily be a match with the last file used).

I prefer to use ProTaper™ files to clean and shape my canals. Can I still obturate with Thermafil?

Q
A
Absolutely. ProTaper™ gives the ideal shape for the easy application of Thermafil.

Is Thermafil conventional gutta-percha?

Q
A
Yes. The gutta-percha commonly used in dentistry is beta phase. Alpha phase has the same chemical formula, but has been annealed by a proprietary process to achieve a more linear crystalline structure, resulting in different physical properties. When heated, alpha phase becomes exceedingly sticky and tacky, and has excellent flow characteristics. This heated gutta-percha exhibits a wetting phenomenon that causes it to adhere to the carrier. The flow properties allow the gutta-percha to obturate available lateral and accessory canals.
Frequently Asked Questions

The gutta-percha seems to be stripping off the carrier and gathering at the orifice. What is the situation here?

Q:  
A: This appearance is normal. The obturator has been designed with excess gutta-percha to accommodate even the most widely flared canals; the accumulation at the orifice is excess gutta-percha backflowing coronally, not gutta-percha that has been stripped away from the carrier.  

Due to the wetting phenomenon of alpha phase gutta-percha, a thin layer remains on the carrier at all times if the obturator has been heated properly. The final proof is in the excellent results that Thermafil has achieved in minimising leakage as seen in dye study test results.

How long do I have from the time I heat the obturator until the time I insert it into the canal?

Q:  
A: You have approximately 8-10 seconds to insert the obturator after removal from the oven. Insertions are normally carried out within a 6-7 second transfer time.

Can Thermafil be used in curved canals?

Q:  
A: Yes. The plastic carrier is inherently flexible, eliminating the need to pre-curve it. The use of Thermafil is not restricted by canal size or shape.

How long before the gutta-percha sets once it is in the canal?

Q:  
A: The gutta-percha becomes progressively harder/firmer over a 2-4 minute period. (The larger the obturator the longer the setting time)

Can the obturator be extended or retracted within minutes of filling the canal and not disturb the seal?

Q:  
A: It is possible to extend the obturator further as long as the gutta-percha remains sufficiently plasticised. Retraction of the obturator is not recommended; void formation and/or seal disruption may occur.
Frequently Asked Questions

What do I do if I have to retreat the canal?

A well condensed gutta-percha root canal filling can be difficult to remove irregardless of technique. Clinical studies have shown that Thermafil is no more difficult to remove than gutta-percha obturated by lateral condensation. To remove Thermafil, initially soften the gutta-percha with chloroform and then position 1 or 2 Hedstroem files beside the carrier. Using the retreatment groove uniquely incorporated into the plastic carrier will then facilitate the removal of the remaining Thermafil.

Use of rotary files (e.g. ProTaper) at higher RPMs than usual or ultrasonics (e.g. ProUltra) will quickly remove the Thermafil in cases where removal by softening is difficult.

I’ve had a patient experience post-op pain when I’ve used Thermafil to obturate the canal. What is causing this?

Obturations with Thermafil experience no more post-op pain than any other methods. The most frequent causes of this transient pain are overinstrumentation, expulsion of irrigating fluids past the apical constriction and into the periapical tissues, unrelieved excessive occlusal forces, and extrusion of sealer and/or filling materials into the periapical tissues. Pain that persists beyond this point may be due to an existing periapical infection, an unfilled canal that was inadvertently overlooked, a root fracture, inadequate root canal cleansing, a leaking temporary filling or another inflamed tooth.

Because Thermafil so completely obturates the root canal system and can push unremoved canal contents through to the periapex, this technique is not forgiving of incompletely cleansed, debrided, and dried canals.
Frequently Asked Questions

Will I get voids in the gutta-percha?

**Q**

You may notice tiny voids in the coronal one-third of the canal. These result from air as it is displaced by the apically moving gutta-percha, causing it to backflow coronally. Vertical compaction of the coronal gutta-percha can alleviate these voids. The groove in the plastic carrier also helps reduce this problem. An occasional, uncommonly large canal, or one with internal resorption or a large flare, may require additional portions of softened gutta-percha to complete the obturation.

**A**

*Use appropriate size pluggers for additional vertical condensation of coronal gutta-percha.*

When cutting off the top portion of the carrier, will the vibrations from the bur affect the seal?

**Q**

To avoid this, stabilise and secure the obturator by applying finger pressure to the handle while severing the shaft with a Prepi® or round bur in a high-speed handpiece.

**A**

*Timing of post space is operator preference, but there is no reason that post space cannot be prepared at the time of Thermafil obturation. There are several ways of doing this including using a Gates-Glidden bur (you will find that you will have to “lean” on it a little more than usual), a Peeso drill or a combination of both.*

Post drills with non-cutting tips are of no use. We recommend the Pro-Post® system which is the only post system that offers a unique acid-etched surface to enhance retention. The Pro-Post® drill tip is designed to be eccentric; that is, off the geometric centre. This allows the drill to stay centred as it rotates - forming a precise post hole diameter. The Pro-Post® drill is extremely efficient for creating post space in canals obturated with Thermafil plastic carriers. The Post-Space bur is another alternative.
Ordering Information

**Thermafil® Intro Kit with Case**

A016922012000X
- Thermaprep Plus Oven
- Posterior Assorted Thermafil (4 x 20, 4 x 25, 4 x 30, 4 x 35, 4 x 40)
- Anterior Assorted Thermafil (3 x 45, 3 x 50, 3 x 55, 3 x 60, 3 x 70, 2 x 80, 2 x 90, 1 x 100)
- Verifiers Assorted 20-45, Verifiers Assorted 50-90
- AH Plus®
- 5 Endo Training Blocks
- Maillefer Thermafil Video

**Thermaprep® Plus Oven Kit**

A176A22000200
- Thermaprep Plus Oven
- Posterior Assorted Thermafil (4 x 20, 4 x 25, 4 x 30, 4 x 35, 4 x 40)
- Verifiers Assorted 20-45

A016602502000
- Thermafil – Individual Packs of 6
  All 25mm Sizes Available: 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90, 100, 110, 120, 130, 140

A034802502000
- Thermafil – Individual Packs of 30
  All 25mm Sizes Available: 20, 25, 30, 35, 40

A016700090000
- Posterior Assorted Thermafil (4 x 20, 4 x 25, 4 x 30, 4 x 35, 4 x 40)

A016800090000
- Anterior Assorted Thermafil (3 x 45, 3 x 50, 3 x 55, 3 x 60, 3 x 70, 2 x 80, 2 x 90, 1 x 100)

A017502502000
- Verifiers 25mm Individual Packs of 6
  Sizes Available: 20, 25, 30, 35, 40, 45, 50, 55, 60, 70, 80, 90

A017502590000
- Verifiers 25mm Assorted Packs of 6 20–45

A017502590100
- Verifiers 25mm Assorted Packs of 6 50–90

A017400001000
- Thermafil training blocks (12) #30 .04