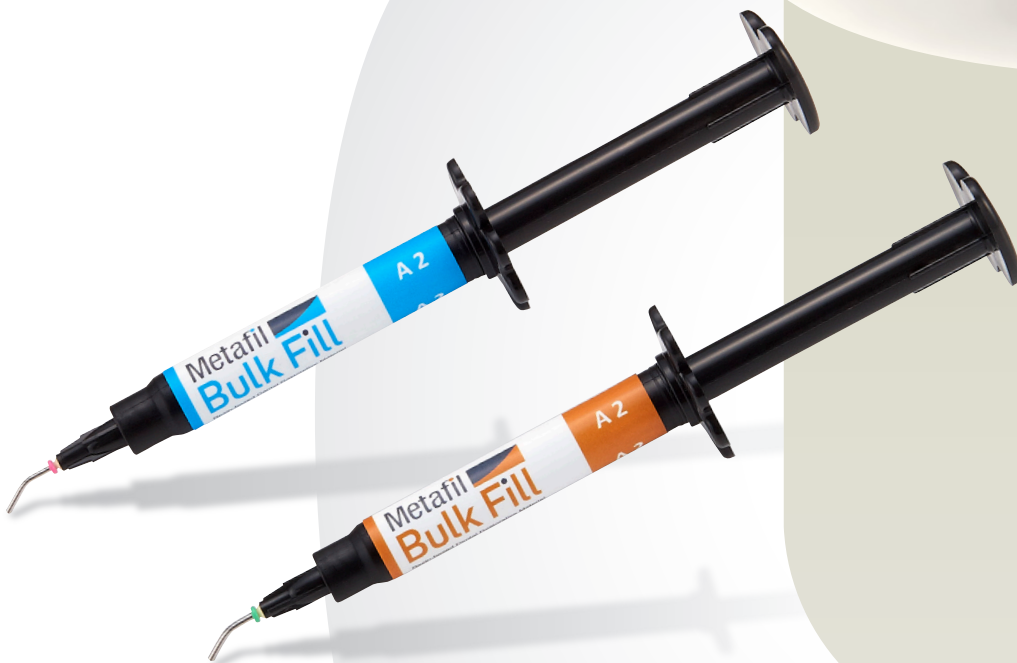


Metafil Bulk Fill

Resin-based Dental Restorative Material

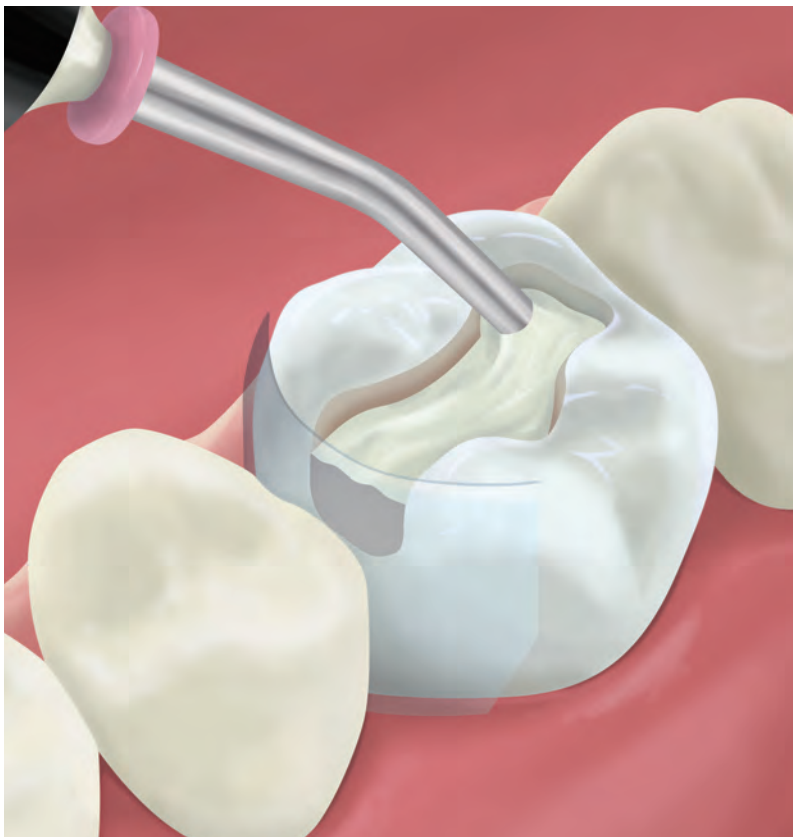
**Bulk fill flowable
our new solution!**



"Metafil Bulk Fill" restore with confidence and save time.

Metafil Bulk Fill is a resin-based light-cure, radiopaque and flowable restorative material for both direct and indirect restorations.

Its low polymerization shrinkage rate allows dentists to restore with a single layer placement up to 4 mm. Metafil Bulk Fill minimizes the post operative complications and reduces chair time associated with treating deep cavities.



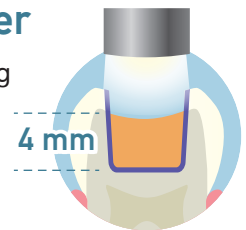
Low polymerization shrinkage rate

Minimize post operative concerns



Place up to 4 mm with a single layer

Achieve full curing even at the deepest area



Curing time: 10 sec.

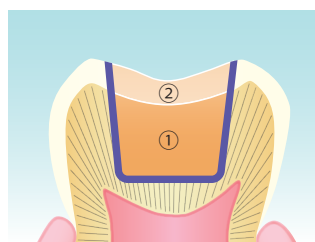
Save chair time



The polymerization shrinkage of resin can pull bonded tooth structure toward resin side. This can cause post operative discomfort and poor adhesion between resin and tooth.

To compensate this stress, incremental placement technique was commonly deployed. However often longer chair time has been necessary to treat deep cavities.

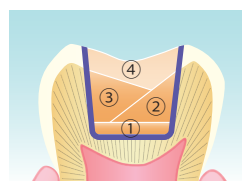
Metafil Bulk Fill is the ideal for both clinical confidence and time-saving.



Bulk Fill method (with Metafil Bulk Fill)

■ Bonding

- ① Metafil Bulk Fill
- ② Composite resin



Conventional layering method

■ Bonding

- ① Flowable Liner
 - ② Composite resin
 - ③ Composite resin
 - ④ Composite resin
- } Need to fill layer by layer

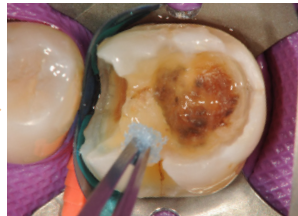
Direct restoration

Metafil Bulk Fill can be placed up to 4 mm increments including occlusal surface. Veneering with composite resin can be used optionally when higher aesthetic is deserved.

Metafil Bulk Fill (Low-Flow Universal)



Cavity preparation



Applying Hybrid Bond ONE



Filling with Metafil Bulk Fill



Final polished restoration

Metafil Bulk Fill (Medium-Flow Universal)



Cavity preparation



Applying Hybrid Bond ONE



Medium-Flow adapts to the cavity without being too runny



Occlusal surface was finished with composite resin

Indirect restoration

Metafil Bulk Fill can be used for indirect restoration. Blue is easy to distinguish it from teeth.

Metafil Bulk Fill (Low-Flow A2)



After cavity preparation, applying Hybrid Bond ONE



Buildup with Metafil Bulk Fill



Preparation for gold inlay restorations

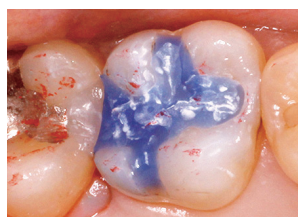


Restored with gold inlays

Metafil Bulk Fill (Medium-Flow Blue)



Cavity preparation



After restoring 2nd molar, 1st molar was filled with Hybrid Bond One and Metafil Bulk Fill



The tooth was prepared after confirming the lack of symptoms



Finished preparation (ready for impression)

Low polymerization shrinkage

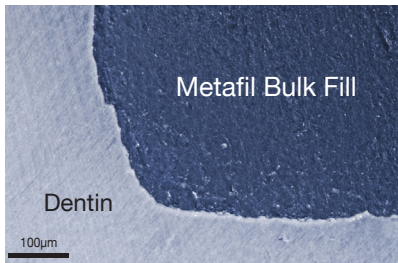
LPS monomer*

Polymerization shrinkage for each monomer	
Monomer	Polymerization shrinkage (%)
LPS monomer	2.0
Bis-GMA	4.5
UDMA	7.0

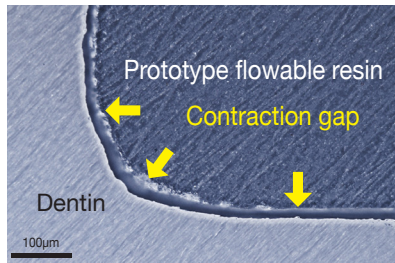
Metafil Bulk Fill has achieved a low polymerization shrinkage rate of less than 2% with newly developed LPS monomer.

*LPS stands for "Low Polymerization Shrinkage". LPS monomer, newly developed by Mitsui Chemical Inc., provides a lower shrinkage rate than other monomers in the market. (Source: Sun Medical Co., Ltd.)

Comparison of cavity adaptation



Metafil Bulk Fill (with LPS monomer)

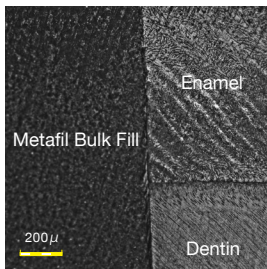


Prototype flowable resin (without LPS monomer)

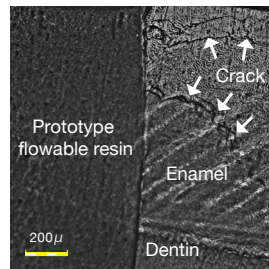
Metafil Bulk Fill would reduce the polymerization shrinkage stress. It will lead to better adaptation to the cavity.

*Microscope evaluation (Source: Sun Medical Co., Ltd.)

Comparison of polymerization shrinkage stress



Metafil Bulk Fill (with LPS monomer)



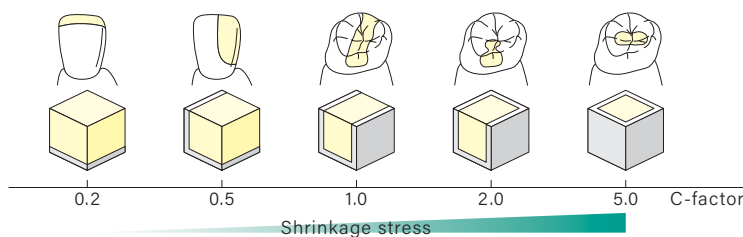
Prototype flowable resin (without LPS monomer)

The cavity (C-factor*=5) was bonded and bulk filled with Metafil Bulk Fill. Restored tooth was sectioned for observation. No contraction gaps or enamel cracks were observed when Metafil Bulk Fill containing LPS monomer was used. In contrast, enamel cracks by polymerization shrinkage stress were observed when a prototype flowable resin without LPS monomer was used.

*Microscope evaluation (Source: Sun Medical Co., Ltd.)

*C-factor: Configuration factor

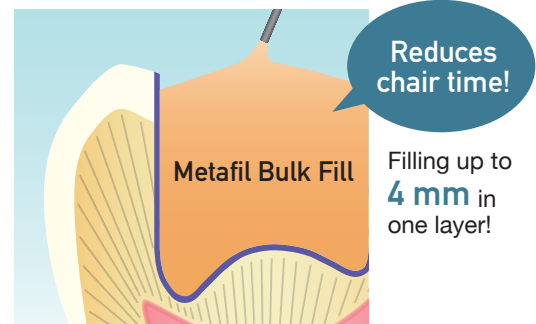
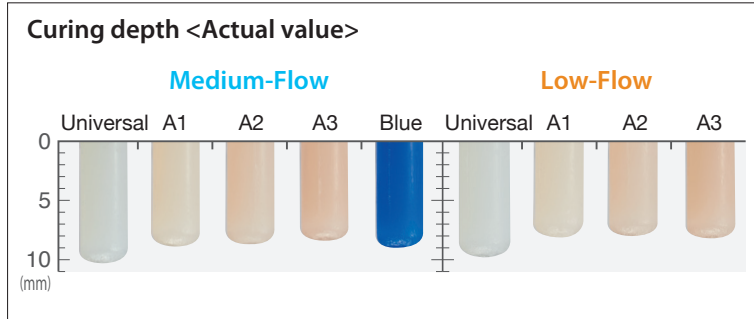
$$C = \frac{\text{The number of bonded surfaces}}{\text{The number of un-bonded surfaces}}$$



*The cavity configuration factor (C-Factor) is defined as the ratio of the bonded to un-bonded surface area. Higher shrinkage stress occurs with increasing C-factor values. When the shrinkage stress surpasses the bond strength, the risk of contraction gaps becomes higher. Likewise, the risk of enamel crack becomes higher when it surpasses the strength of enamel.

Place up to 4 mm with a single layer in just 10 sec.

Even for a deep cavity, it can be placed up to 4 mm with a single layer due to the high curing depth performance.



*Note: ISO 4049:2019 standard (LED light ; 1000 mW/ cm² ; 10 sec.), curing depth is one half of actual value.
(Source: Sun Medical Co., Ltd.)

Radiopaque

A favorable radiopacity was confirmed.

After application of Metafil Bulk Fill



(Source: Sun Medical Co., Ltd.)

Physical properties summary

	Metafil Bulk Fill		In-house Flowable CR	Test method
	Medium-Flow	Low-Flow		
Polymerization shrinkage (%)	2.1	2.0	3.4	ISO 17304
Flexural strength (MPa)	145	145	115	ISO 4049: 2019
Curing depth (mm)	4.0*	4.0*	2.0**	
X-ray contrast (%)***	200	200	200	
Wear resistance (mm ³)	1.2	1.1	0.8	Leinfelder method

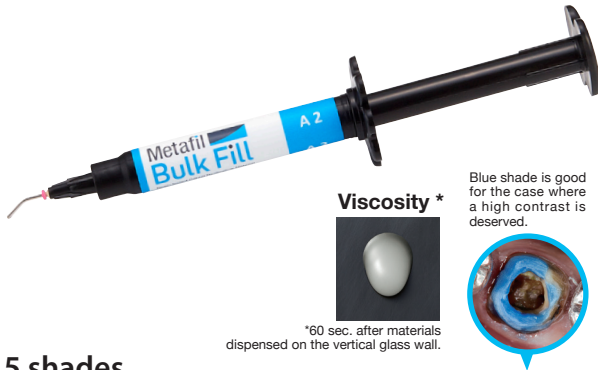
* 10 sec. of curing time by LED
** 20 sec. of curing time by LED
*** Aluminum equivalent

(Source: Sun Medical Co., Ltd.)

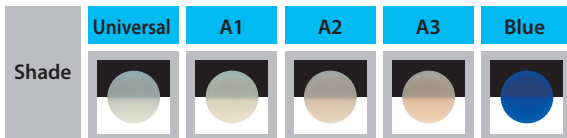
Metafil Bulk Fill

Two types of viscosity and various shades expand the usage of clinical treatments.

Medium-Flow



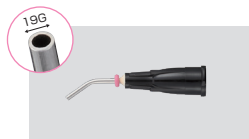
5 shades



Metafil Bulk Fill (Medlum-Flow)
2.5mL /4.8g 5 x 19G Needle Tip

Shade
Universal / A1 / A2 / A3 / Blue

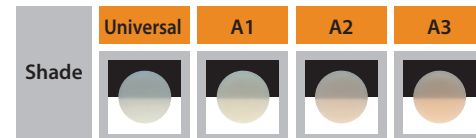
19G Needle Tip (sold separately)
20 x 19G Needle Tip



Low-Flow



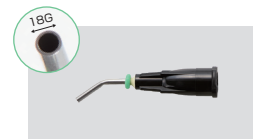
4 shades



Metafil Bulk Fill (Low-Flow)
2.5mL /4.8g 5 x 18G Needle Tip

Shade
Universal / A1 / A2 / A3

18G Needle Tip (sold separately)
20 x 18G Needle Tip



Related Products



Hybrid Bond ONE

One Bottle, One Step, bonding agent.
5µm of thin adhesive layer and durable bonding performance can be achieved by a simple step.



Metafil Flo

Highly-adaptable composite resin.
It contains inorganic fillers and unique organic filler which is very reactive with the matrix resin.
This assures superior handling and highly wear-resistant restoration.

