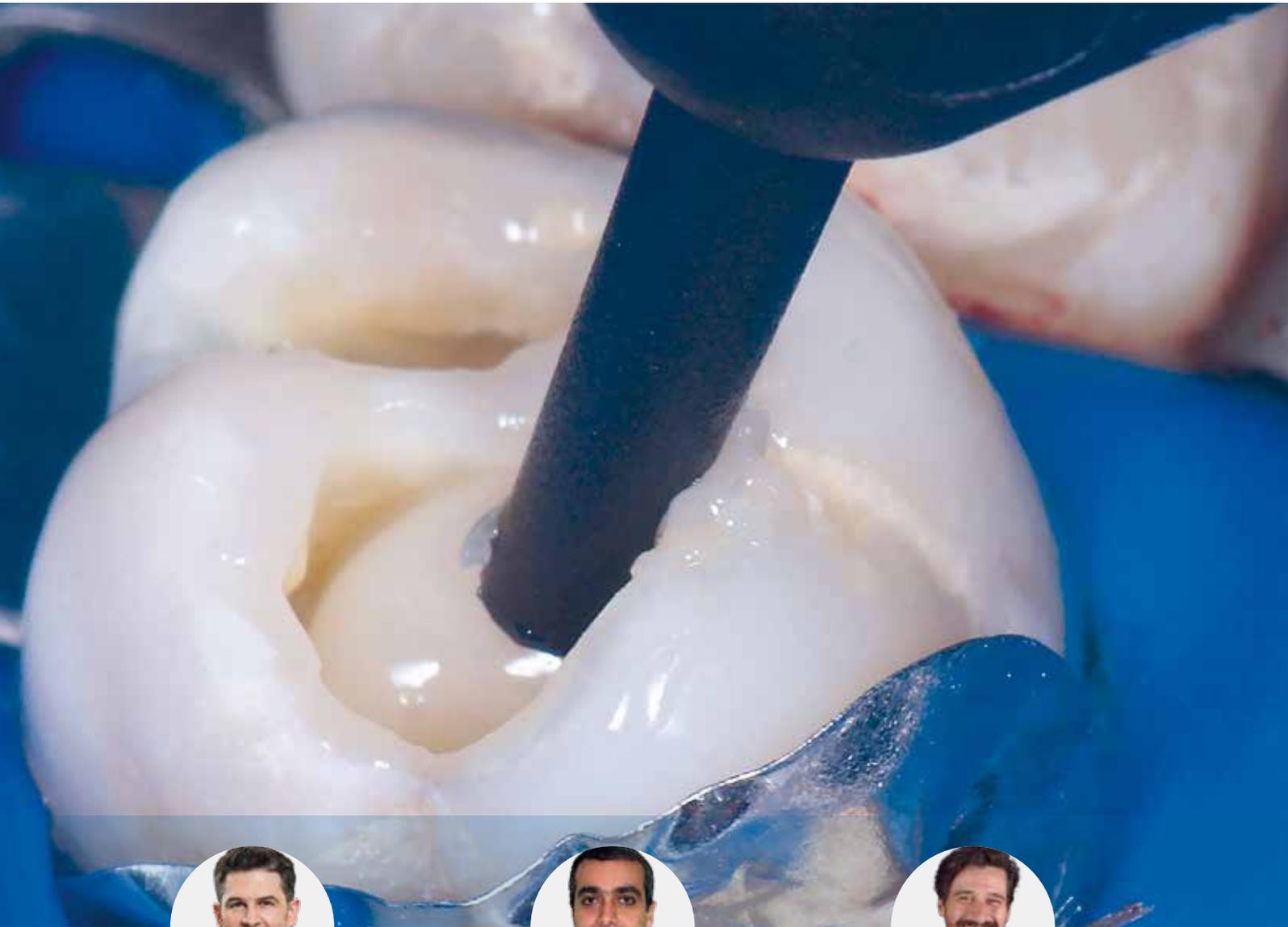


# CLINICAL EXPERIENCE

Case documentation of the first composite with thermally controlled viscosity behaviour – VisCalor bulk



Posterior restoration  
class II

*Dr. Walter Denner*

**More on page 8**



Direct vertical dimension increase  
with silicone impressions

*Dr. Marcelo Balsamo*

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Restoration know-how of  
weakened cusps in vital teeth

*Alessandro Pezzana*

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**Dear colleagues,  
Dear Ladies and Gentlemen,**

Direct restorations should be as uncomplicated and reliable as possible for both the user and the patient. At the same time, the aspect of economic efficiency should be taken into account. With this in mind, VOCO has developed the universal composite VisCalor bulk. The composite with thermally controlled viscosity behaviour represents a new class within filling composites and is considered a global innovation.

In order to be able to produce high-quality restorations, especially in deep and narrow cavities, it is now standard to work with materials of different viscosities, namely a flowable composite as an increment on the cavity floor, as well as a packable composite for the stability and modelling of the restoration in the upper part of the cavity. This common approach provides solid results, but is also very time-consuming and complex.

With the new Thermo-Viscous-Technology it is possible to avoid this effort and thus optimise the treatment process. The innovative procedure causes the composite to be flowable during application at first. The restorative material flows optimally onto cavity walls and undercut regions, which simplifies

and facilitates the filling therapy tremendously. The previous warming of the composite to 65–68 °C is carried out extraordinarily using a pre-heating device or a specially developed hand dispenser. On contact with the tooth, VisCalor bulk cools rapidly to body temperature, gets highly viscous and can be sculpted and modelled without delay just like a conventional, packable composite.

The clinical experiences have shown that the bulk-fill material, VisCalor bulk, with an increment thickness of up to 4 mm, is particularly suitable for the direct therapy of large, narrow or difficult to reach cavities as well as for the treatment of several teeth in one session.

VisCalor and VisCalor bulk are used internationally by many colleagues, which encouraged VOCO to share their experiences and positive feedback with you on the following pages. Enjoy reading. Sending you best regards from Cuxhaven.

Dr. Kai Klimek  
Dentist  
Global Head of Knowledge Communication

## VisCalor bulk

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**Class V restorations with GrandioSO Light Flow and VisCalor bulk**

*Dr. Yassine Harichane (France)*



## Efficient restorations with flowable, packable bulk-fill composites which change their properties to low viscosity when heated (“Thermo-Viscous-Technology”)

*Prof. Dr. Jürgen Manhart (Germany)*

### Introduction

VisCalor bulk takes on the consistency of a flowable composite when heated at the temperature of 68°C with the particularly advantageous VisCalor Dispenser (VOCO) or with a standard Caps Warmer. While cooling down to body temperature it can be modelled like a standard packable composite.

### Case description

- **Patient's age and sex**

59 years, female

- **Diagnosis**

Insufficient amalgam filling in tooth 16



Fig. 2: Situation after the removal of the inadequate restoration



Fig. 3: Situation after excavation of the carious areas and preparation



Fig. 1: Initial situation – insufficient amalgam filling in tooth 16 (photo above intraoral mirror)



Fig. 4: Isolation of the treatment area with rubber dam



Fig. 5: Demarcation of the defect with a metal partial matrix



Fig. 9: Application of the adhesive agent (Futurabond M+, VOCO) on the enamel and dentine with a mini-brush (SingleTim, VOCO)



Fig. 6: Application of phosphoric acid gel (Vococid, VOCO) on the enamel



Fig. 10: The adhesive is carefully distributed on the area with oil-free compressed air



Fig. 7: After 15 s, etching is done on the dentine too where it acts for another 15 s



Fig. 11: Light-curing of the adhesive for 10 s



Fig. 8: Careful drying of the cavity after spraying out the phosphoric acid gel



Fig. 12: After light-curing of the adhesive, the sealed cavity shows a uniform shiny surface



Fig. 13: The thermoviscous composite VisCalor bulk is heated to 68°C in a Caps Warmer (VOCO)



Fig. 17: Light-curing of the first layer of the filling material for 10 s



Fig. 14: The slender, flexible cannula of the VisCalor bulk caps facilitates direct application of the filling material even in areas that are hard to reach or narrow cavities



Fig. 18: The second increment of the thermoviscous bulk fill composite (VisCalor bulk) is used to fill the entire remaining volume of the cavity



Fig. 15: In the first step, the cavity is filled with VisCalor bulk up to about half of the defect height (shade universal)



Fig. 19: Polymerization of the second increment of restorative material for 10 s



Fig. 16: The low-viscosity consistency when heated results in excellent flow properties on the cavity walls



Fig. 20: Checking of the filling after removing the metal matrix

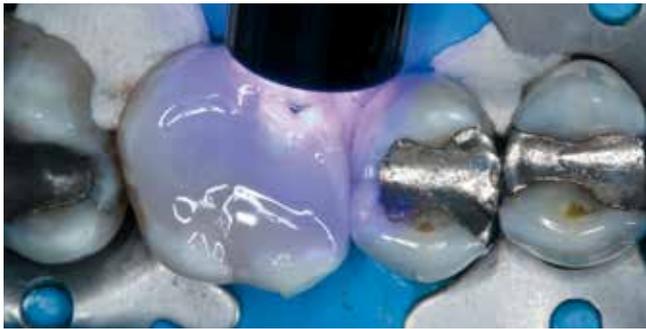


Fig. 21: Additional light-cured polymerisation of the filling material for 10 s on the palatal and approximal side

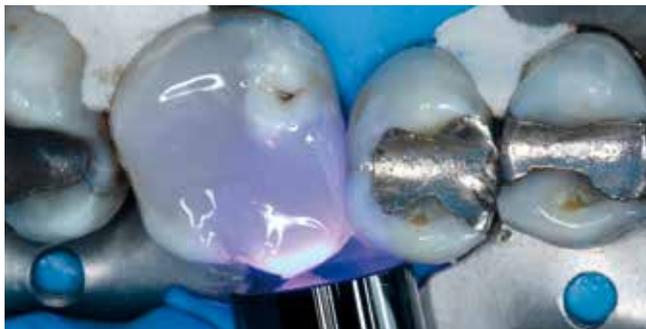


Fig. 22: Additional light-curing for 10 s on the buccal and approximal side



Fig. 23: Completely finished and highly polished VisCalor bulk composite restoration. The function and aesthetics of the tooth are restored.

### Conclusion

As soon as VisCalor bulk has cooled down to tooth temperature in the cavity, the modelling properties of the material match those of a good posterior tooth composite, i.e., anatomical structures such as marginal ridges, cusp slopes or triangular ridges can be worked accurately. VisCalor bulk can be easily contoured and finished with rotating diamond instruments. A high gloss can easily be achieved complication-free with composite polishers.

### Author

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## Posterior restoration with the new thermoviscous nanohybrid composite VisCalor bulk

*Dr. Walter Denner (Germany)*

### Introduction

Treatment of a carious lesion with the new thermoviscous composite VisCalor bulk reduces the number of treatment steps required, even when employing the incremental technique in the scope of restorative treatment with composites in the posterior region. Following removal of the caries and preparation of tooth 14, the operating site is isolated with a rubber dam and a sectional matrix placed in position. Following the usual pre-treatment of the cavity with an adhesive, the warmed VisCalor bulk was applied directly into the Class II cavity and the mesial proximal wall completely sculpted in one layer up to the marginal ridge. In a second step, the rest of the cavity was first filled and then sculpted. This was followed by finishing and polishing of the posterior restoration.

### Case description

#### Medical History

The patient, who was 17 years old at the time of the treatment, was sent to the dentist by his mother because of brown stains on his anterior teeth. He was in good general health but with teeth showing signs of caries activity. The teenager had not seen a dentist for three years because he “wasn’t motivated” and presented with correspondingly poor oral hygiene. Nevertheless, he wished to have the caries in the visible area removed.

#### Findings and diagnosis

##### • Clinical and instrumental findings

There was nothing extraordinary about the extraoral findings. The intraoral investigation, however, revealed poor oral hygiene with relatively healthy looking oral mucosa, although gingivitis with probe depths of  $\geq 3$  mm was recorded.

Carious lesions were identified in teeth 13, 14 and 16. The radiological diagnostics using a panoramic radiograph and bitewing x-rays confirmed the presence of multiple carious lesions in both the anterior and posterior regions. A mesial C3 lesion in combination with demineralisation extending into the outer dentine was found in tooth 14.

##### • Diagnosis

Mild gingivitis and primary caries in teeth 13, 14 and 16.

### Treatment

##### • Treatment plan

The treatment plan consisted of removal of the caries using an adhesive restorative treatment.

##### • Sequence of treatment steps for tooth 14

1. Caries removal and preparation with rotary instruments
2. Separation from neighbouring tooth with sectional matrix ring and wedges
3. Production of bevelled margins with preparation instruments and Bevelshape files
4. Insertion of rubber dam and rubber dam clamp W4
5. Insertion of sectional matrix with wedge
6. Etching with Ultra-Etch phosphoric acid gel (Ultradent)
7. Application of adhesive (Futurabond U, VOCO)
8. Curing of adhesive with Valo curing light (Ultradent)
9. Insertion of Palodent V3 sectional matrix ring (Dentsply Sirona)
10. Application of first layer of warmed VisCalor bulk, sculpting with CPRO1 spatula (Deppeler) and curing (Valo, Ultradent)
11. Insertion of second layer of warmed VisCalor bulk, sculpting with microbrush applicator (microbrush International) and CPRO1 spatula (Deppeler), curing (Valo, Ultradent)

12. Removal of surgical aids followed by removal of excess material with scaler (T2/T3, Aesculap)
13. Finishing, occlusion check and polishing with rotating instruments (Komet), articulating paper red 200  $\mu\text{m}$  (Bausch) and diamond polisher (Dimanto, VOCO)

## Result

### • Before-and-after comparison

The carious lesion in tooth 14 was treated minimally invasively using a direct composite filling. The lesion in tooth 13 was treated in the same session and that in tooth 16 in one of the subsequent sessions.

## Discussion

### • Reasons for treatment decisions

The progression of the multiple carious lesions should be stopped and the future development of further lesions avoided. With the aim of avoiding a relapse, the decision was taken for a session on motivation and individual prophylaxis.

### • Indications of VOCO products used

Among other things, restorative treatment employing the adhesive technique in the posterior region can be used to treat large and partly narrow Class I and II cavities as well as Class V cavities.

### • Particular advantages of VOCO products used

The use of VOCO products is simple and uncomplicated:

- The Futurabond U adhesive is a one-component system, which is available in the practical and hygienic *SingleDose* and can be applied in one step.
- The thermoviscous VisCalor bulk composite caps are warmed and applied with the same VisCalor Dispenser (VOCO). The warming makes the material flowable first and then packable and sculptable after a short time (thermo-viscous-technology). The optimal flow over the cavity floor, margins and undercut regions minimises the risk of marginal gap formation, plus the thin tip is ideal for hard-to-reach areas.

## Conclusion

The patient was very satisfied with the treatment and its results. He has been attending the practice for regular individual prophylaxis ever since. Conscientious following of the guidelines within the scope of restorative treatment

and adhesive dentistry can generally ensure a sense of achievement for both the patient and dentist.

The new thermoviscous nanohybrid composite VisCalor bulk simplifies and improves the procedure for the adhesive restorative treatment of large and narrow cavities. With a volume shrinkage of just 1.44% by volume and a shrinkage stress of 4.6 MPa, VisCalor bulk displays lower shrinkage values than conventional bulk-fill composites.



Fig. 1: Situation before treatment – carious lesions in teeth 14 and 13



Fig. 2: Bitewing x-ray – mesial C3 lesion in tooth 14 among other findings



Fig. 3: Minimally invasive removal of caries with rotary instruments



Fig. 4: Insertion of sectional matrix ring for separation and a wedge to protect the cervical enamel edge



Fig. 8: Sectional matrix in position with cervical adaptation by means of plastic wedge



Fig. 5: Preparation of bevelled margins with Bevelshape file. The non-diamond-coated rear can be rested on the proximal surface of the neighbouring tooth without risking injury.



Fig. 9: Etching of cavity with phosphoric acid gel



Fig. 6: Finished preparation with rubber dam



Fig. 10: Result of preparatory measures



Fig. 7: Demonstration of cavity depth with a periodontal probe: 4 mm



Fig. 11: Application of the adhesive (Futurabond U, VOCO)

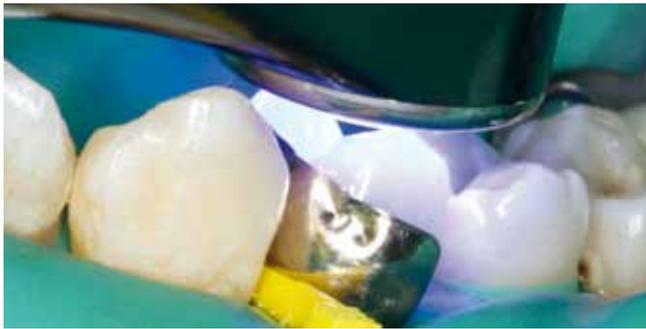


Fig. 12: Light-curing of adhesive (Futurabond U, VOCO)



Fig. 16: Sculpting of mesial proximal wall against sectional matrix



Fig. 13: Pretreated cavity with sectional matrix ring tooth 14



Fig. 17: Proximal creation of mesial marginal ridge



Fig. 14: Application of the first increment of the warmed thermoviscous nano-hybrid composite VisCalor bulk



Fig. 18: Light-curing of the first increment



Fig. 15: First increment in situ prior to sculpting



Fig. 19: Application of the second increment of VisCalor bulk following removal of the sectional matrix ring



Fig. 20: Adaptation and sculpting with microbrush



Fig. 21: Removal of sectional matrix and wedge following light-curing and removal of the excess material with a scaler



Fig. 22: High-lustre polishing with diamond silicone polishers (Dimanto, VOCO)



Fig. 23 and 24: Finished restorations in teeth 14 and 13 with rubber dam / Follow-up image of restorations after individual prophylaxis 3 months later

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## Direct vertical dimension increase with silicone impressions

*Dr. Marcelo Balsamo (Brazil)*

### Introduction

Functional disorders can result in excessive loss of dental hard tissue, further resulting in loss of the vertical dimension of occlusion (VDO) over time. This can consequently be detrimental to the long-term success of an aesthetic restoration. In the case described below, the bilateral balanced occlusion was severely compromised, which should be viewed as a serious risk of failure with regard to the planned anterior restorations with ceramic veneers.

This study describes the approach the clinical procedure for oral rehabilitation with long-lasting success can take if the vertical dimension of occlusion is classed as compromised. In such cases, direct restorations with the thermoviscous bulk-fill composite VisCalor bulk and the help of the silicone impression technique in the form of a function-orientated template can contribute to long-lasting success.

### Case description

#### • Medical history

A middle-aged male patient presented in the dental practice complaining of “fracture sites on the upper teeth”, which were “becoming worse every year”. He did not report any pain; it was more the aesthetic aspect that had been the main problem for the patient for some time already. His medical history was normal.

#### • Diagnosis

Loss of vertical dimension of occlusion (VDO) with associated defects in the posterior region, resulting from parafunctional habits.

Enamel fractures on all upper and lower anterior teeth as a result of different chemical and physical influences.

### Result

The vertical dimension increase with direct composite restorations using silicone impressions is an easy-to-use, cost-effective and efficient technique, which is why the dentist should always consider it as a treatment option.



Fig. 1. 2a and 2b: Initial situation with enamel fractures on the anterior teeth as well as multiple and severe instances of attrition, abrasion and erosion



Fig. 2a



Fig. 2b



Fig. 6: Application of the adhesive (Futurabond U, VOCO)



Fig. 3: Silicone impression (Registrado Clear, VOCO) for transfer of the wax-up simulation



Fig. 7: Light-curing of the adhesive



Fig. 4: All areas of the teeth involved in this process must be roughened to produce a retentive surface

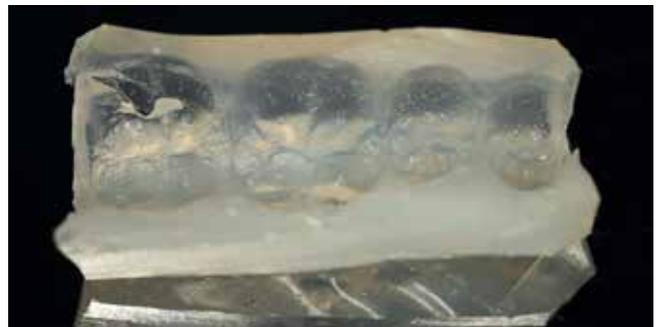


Fig. 8: The silicone impression is produced from the lab's diagnostic wax-up and aids the dentist with the clinical orientation



Fig. 5: Application of phosphoric acid gel (Vococid, VOCO)



Fig. 9: VisCalor bulk is applied to the silicone impression in a flowable consistency following warming in the special VisCalor Dispenser (VOCO)



Fig. 10: The consistency changes during the cooling phase, with VisCalor becoming increasingly packable



Fig. 14: Before-and-after comparison – Situation following vertical dimension increase with direct restorations

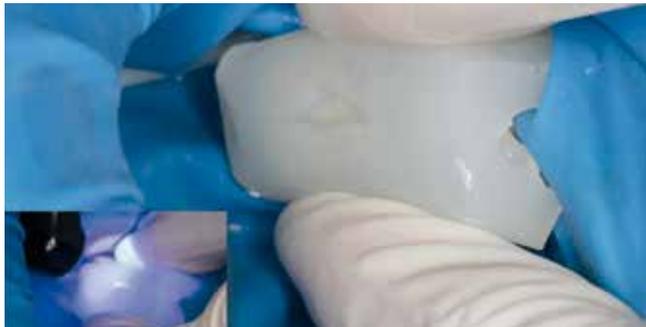


Fig. 11: The silicone impression is pressed gently against the teeth and light-cured for 10 s. The final light-curing is then performed for a further 10 s.



Fig. 15: The occlusal adjustment should naturally be performed directly after restoration of the bilaterally supported occlusion



Fig. 12: Preliminary results following repair of the enamel defects. The buccal and lingual surfaces still need to be finished



Fig. 16: As there is more space available between the incisors in the anterior region following the vertical dimension increase, the fractured and abraded areas could initially be temporarily restored



Fig. 13: Unlike with a conventional direct restoration, the silicone impression technique does not require the time-consuming removal of excess material, especially on the occlusal surfaces



Fig. 17: Admira Fusion (VOCO) was used for the temporary restoration in the anterior region. The permanent restoration with ceramic veneers should not be performed until weeks after the completion of the familiarisation phase.



Fig. 18: Situation prior to treatment of the anterior region with permanent restorations



Fig. 19: Permanent anterior restorations in mandible and maxilla with ceramic veneers (IPS e.max, Ivoclar)

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## Restorative treatment of an approximal caries on tooth 16 with the bulk-fill material VisCalor bulk

*Prof. Dr. Christian Gernhardt, Dominik Zech, Dr. Antje Diedrich (Germany)*

### Introduction

Both the patient and the dentist want a restoration of carious lesions that is fast and as aesthetic as possible. Conventional bulk-fill materials have already made it possible to restore large defects very quickly, but they have problems with narrow, small cavities, as adapting to cavity walls and floor is often difficult to achieve. The new bulk-fill material VisCalor bulk combines primary flowability and final modelling in one product, thus making the treatment procedure much easier. In the case described below, a 24-year-old female patient was directly restored with VisCalor bulk in an approximal primary caries on tooth 16 diagnosed during the annual check-up.

### Case description

#### Case history

- **Patient's age and sex**

The patient, female, was 24 years old at the time of treatment

- **Diagnosis**

Primary caries was diagnosed on all wisdom teeth and on teeth 16, 46 and 47

### Results

- **Before-and-after comparison**

Discoloured, insufficient occlusal-palatal filling. Subsequently, anatomical cusp and molar tooth shape was restored. Good colour matching thanks to high translucency.

### Conclusion

VisCalor bulk is impressive for its quick processing in two viscosities within a same work step and its good colour matching. Preheating of the material allows good application which does not have a negative effect on the material's properties after polymerisation (Yang et al. 2020). It combines the flowability of a flowable and the modelling properties of a packable composite, and can be used for both narrow and large cavities.

Compared to conventional layered adhesive filling materials, VisCalor bulk stands out for the easier and faster application of larger layers (Colombo et al. 2020). In addition, its comparatively high translucency and the four available colour shades ensure good colour matching

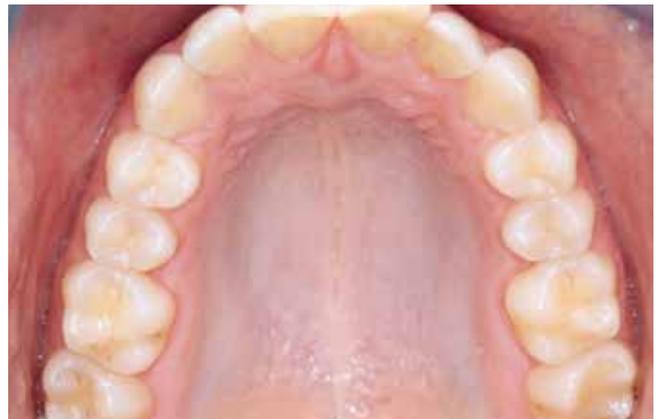


Fig. 1: The occlusal overview shows a neat, almost caries-free permanent dentition. The affected tooth 16 clinically hardly shows its distal caries.



Fig. 2: Occlusal detail view of tooth 16 – The distal caries is hardly visible



Fig. 3: The patient's X-ray image (OPG) – These lesions can be diagnosed as approximal caries 16 (C3) and approximal caries 46/47 (C3)



Fig. 6: View of tooth 16 after complete removal of the caries, the old restoration and the preparation of the cavity



Fig. 7: View of tooth 16 after placing an already anatomically curved matrix



Fig. 4: Occlusal view of tooth 16 after placing the rubber dam



Fig. 8: Occlusal view after phosphoric acid gel application for selective enamel etching



Fig. 5: View of tooth 16 after removal of marginal ridge and presentation of the lesion



Fig. 9: View of the tooth after the entire cavity was covered with phosphoric acid gel



Fig. 10: Occlusal view of the cavity after conditioning with phosphoric acid gel



Fig. 14: The four different shades of the VisCalor bulk material - in addition to the universal shade U there are the three VITA shades A1, A2 and A3 available



Fig. 11: The activation of Futurabond U (VOCO) before application



Fig. 15: VisCalor Dispenser (VOCO) during the warming phase in setting 1 (30 s) - after that, the warming material can be applied



Fig. 12: Occlusal view of the cavity wetted with adhesive (Futurabond U, VOCO)



Fig. 16: Occlusal view of the cavity with filling material applied. In this case, two different shades (A3 and A2) were used.



Fig. 13: VisCalor Dispenser (VOCO) enables a simple and effective warming of the composite to 65 °C. Two different settings, which differ in warming time and intensities, are available.



Fig. 17: View directly after placing the filling and removing the matrix in the run-up to finishing and polishing



Fig. 18: Final occlusal view of the final restoration after finishing and polishing



Fig. 19: At the end of treatment, a smiling and satisfied patient

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Detailed case  
documentation as pdf



## Restoration of class II cavity with VisCalor bulk

*Miguel Stanley, Inês Miguel, Catarina Rodrigues (Portugal)*

### Introduction

This case describes a patient with an insufficient amalgam restoration in tooth 36, which is replaced with an ultra-modern bulk-fill composite filling using an innovative, novel technique. The amalgam was removed using a rubber dam, the cavity cleaned and the filling replaced with a pre-warmed thermoviscous composite employing the adhesive technique.

### Case description

#### Medical history

- **Age and sex of patient**

Female, 61 years old

- **Reason for visiting dentist**

The patient reports about “problems at back left of lower jaw”

- **Diagnosis**

Insufficient filling in tooth 36 requiring replacement

### Result

- **Before-and-after comparison**

An insufficient and older amalgam filling was replaced with an ultra-modern bulk-fill composite restoration, achieving outstanding results from an aesthetic perspective and the patient could be discharged with satisfaction.

### Discussion

- **Particular advantages of VOCO products used**

VisCalor takes on the consistency of a flowable composite when warmed to 68 °C. The warming can be performed in the particularly advantageous VisCalor Dispenser (VOCO) or a Caps Warmer (VOCO). As it cools down and at body temperature the material changes its consistency and

becomes increasingly sculptable, comparable to a packable composite. It is practical and efficient in its use, delivering aesthetic results.

### Authoren

**Inês Miguel**, dentist

**Miguel Stanley**, dentist

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Fig. 1: Situation before treatment – Tooth 36 with rubber dam. The premolars are to be restored in the subsequent session at the patient's request.



Fig. 2: Clinical situation after removal of the insufficient amalgam restoration in tooth 36



Fig. 3: Application of the dual-curing universal adhesive Futurabond U (VOCO) in the Class II cavity



Fig. 7: FinalTouch (VOCO) in brown is used for the shade characterisation



Fig. 4: VisCalor Dispenser (VOCO) – Setting the programme for the VisCalor bulk material



Fig. 8: Restoration following application of the bulk-fill composite made from VisCalor bulk and shade characterisation with FinalTouch (VOCO)



Fig. 5: VisCalor Dispenser (VOCO) – VisCalor bulk is warmed for 30 s and can be applied within two and a half minutes with the VisCalor Dispenser (VOCO)



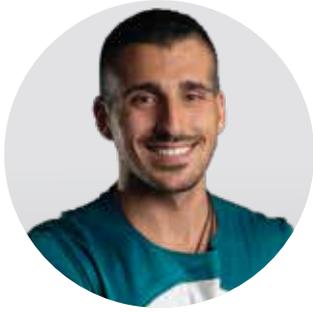
Fig. 9: Finished composite restoration with rubber dam in situ



Fig. 6: VisCalor Dispenser (VOCO) – Application of the VisCalor bulk composite in shade A3



Fig. 10: Final clinical situation of tooth 36 following finishing



# Direct restoration of multiple teeth with the thermoviscous composite VisCalor bulk

Trifon Trifonov (Bulgaria)

## Introduction

The case presented here describes the post-endodontic (tooth 24) direct restoration of multiple teeth (teeth 24, 25 and 26) with a thermoviscous bulk-fill nano-hybrid-composite (VisCalor bulk, VOCO) which is characterised by unique advantages. The first upper left premolar had been treated endodontically for removing the odontogenic source of infection and resulted in the complete regression of the fistula that was draining pus on the vestibular mucosa between the upper premolars.

## Case description

### Reason for dental consultation

A 25-year-old woman presented for throbbing pain in the left maxillary region as a possible odontogenic infection.

### Diagnosis

- Caries on teeth 24–27
- Reversible pulpitis of tooth 26 and irreversible pulp damage of tooth 24
- Pulp necrosis and acute suppurative pulpitis draining pus in the oral cavity through a fistula between the maxilla's left upper premolars

## Results

### Before-and-after comparison

- Healing of the sinus tract with no symptoms
- No radiological findings at 6 months follow-up
- Conservative restoration of teeth 24 to 26
- Restoration of function and aesthetics to teeth 24 to 26
- Full patient satisfaction with shortest treatment time possible



Fig. 1: Intraoral x-ray for pre-operative assessment of crown, pulp chamber, roots and peri-radicular areas reveals apical transparency at one root of tooth 24 and several fillings in-situ



Fig. 2: Intraoral x-ray for the operative assessment of working lengths for RCT (root canal treatment) of tooth 24 with rubber dam clamp in-situ



Fig. 3: The intraoral x-ray for the post-operative assessment showed an RCT. This x-ray was used as a reference when reviewing the patient 6 to 12 months later. No signs or symptoms after 6 months



Fig. 4: Rubber dam isolation after caries removal

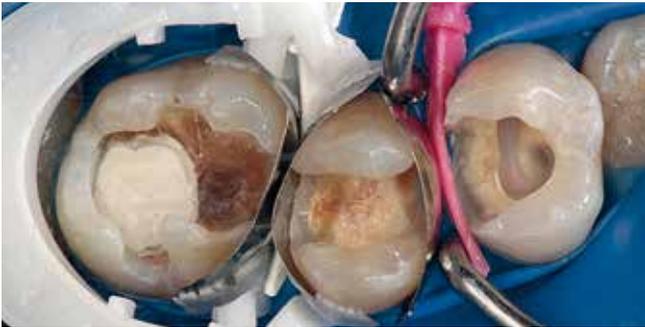


Fig. 5: Matrices in place



Fig. 6: Proximal wall build-up



Fig. 7: Finished thermoviscous bulk-fill with VisCalor bulk

**Author**

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Detailed case  
documentation as pdf



# Composites with variable viscosity for bulk-fill restorations in one step

*Gianfranco Roselli (Italy)*

## Introduction

The aims in the further development of the adhesive technique are the conservation of the dental hard tissue, a simplified procedure and thus a shorter treatment time. In the direct restoration of posterior teeth, the aim can also be achieved by utilising universal adhesives and bulk-fill composite materials.

## Case description

### • Reason for visiting dentist

A 31-year-old patient presented with pain resulting from a broken-off piece of tooth in the upper left jaw. The gingiva in the area was also swollen and bits of food would get stuck in the area.

### • Diagnosis

- Dental caries (ICD10 > K02.1) with Class II geometry according to Black in tooth 25
- Deep extension of caries in tooth 25 into the dentine (D4 caries according to Marthaler and Lutz)
- Partial crown fracture of tooth 25 in the area of the distal marginal ridge

## Result

### • Before-and-after comparison

It was possible to relieve the pain. The anatomical redesign of the occlusal surface on tooth 25 restores the functionality within the masticatory apparatus.

## Author

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Fig. 1: Carious lesion in tooth 25



Fig. 2: Cleaning of cavity



Fig. 3: Indirect capping with a glass ionomer cement, followed by treatment with a temporary filling (not shown in photo)



Fig. 4: Indications of irreversible pulp damage with heavy bleeding 2 days later

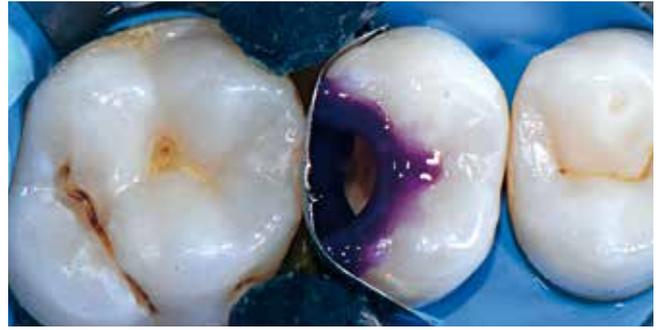


Fig. 9: Etching of the enamel for 30 s (on avital tooth)



Fig. 5 and 6: Situation following preparation of root canal / Situation following root-canal filling



Fig. 10: Rubbing of Futurabond M+ (VOCO) into surface for 20 s



Fig. 7: Separation of the distal portion of tooth 25



Fig. 11: Restoration of marginal ridge with GrandioSO (VOCO) to convert the cavity from Class II to Class I



Fig. 8: Stabilized matrices and wedge in situ



Fig. 12: Finishing of marginal ridge without sectional matrix



Fig. 13: VisCalor in the flowable phase following warming to 65°C in the VisCalor Dispenser (VOCO)



Fig. 17: Shade customisation with FinalTouch (VOCO) in brown



Fig. 14: Bulk-fill restoration in just one step



Fig. 18: View from palatal with good shade results



Fig. 15: Occlusal sculpting once sculptable consistency reached



Fig. 19: Result following finishing and polishing



Fig. 16: View from palatal shortly prior to shade customisation



Fig. 20: X-ray upon completion of treatment



## Restoration know-how of weakened cusps in direct restorations of vital teeth

Cusp coverage and cavity class conversions to avoid indirect restorations

*Alessandro Pezzana (Italy)*



Fig. 1: Thickness measuring of the extremely thin cusp wall (< 1.5 mm) due to a previous amalgam filling of tooth 26



Fig. 4: Class II and Class VI combined preparation design



Fig. 2: Silicone key prior to cusp reduction for later reconstruction of the original cusp profile

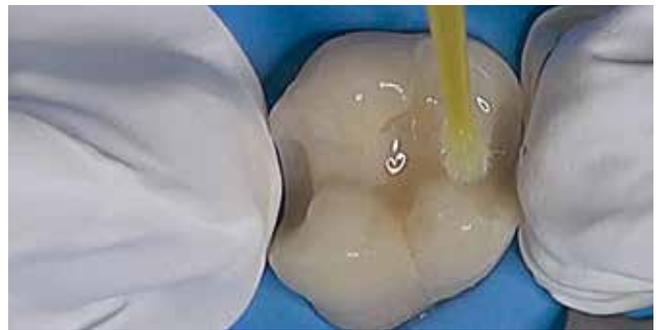


Fig. 5: Application of adhesive (Futurabond DC, VOCO)



Fig. 3: Calibrated reduction of the weakened cusp in preparation for cuspal protection



Fig. 6: Placement into the key of a thick layer of VisCalor bulk (A2) to convert Class VI at the distopalatal cusp into Class II



Fig. 7: Inner reinforcement of the cusp with GrandioSO Light Flow (VOCO), to achieve maximum stabilization of the distopalatal cavity wall



Fig. 11: Occlusal modeling with tiny instruments and endodontic files



Fig. 8: Reestablishment with VisCalor bulk of the marginal ridges and interproximal contacts for converting the Class II into a Class I



Fig. 12: FinalTouch (shade brown, VOCO) for the chromatic characterization of enamel fissures

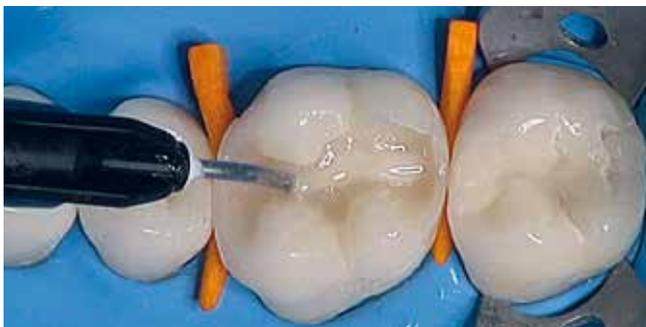


Fig. 9: GrandioSO Light Flow (VOCO) for interproximal reinforcement and for a first occlusal layering



Fig. 13: Chromatic interplay with a lighter shade of VisCalor to lend depth to the cusp slopes



Fig. 10: VisCalor bulk (A2) for completing the filling of the Class I cavity



Fig. 14: Finishing and polishing



Fig. 15: Final result

#### Author

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Short video of the  
clinical case



## Class V restorations with GrandioSO Light Flow and VisCalor bulk

*Dr. Yassine Harichane (France)*

### Introduction

Class V cervical defects are common in both younger and older patients. The causes in older patients are often inadequate dental care and reduced saliva production, for example as a result of taking medications, whilst cervical lesions in young people are more associated with the consumption of sugary drinks and smoking. They can also trigger psychological effects, especially in women. Producing functionally stable, invisible, long-lasting restorations in this area often represents a challenge. The solution selected in the clinical case described below consisted of the use of GrandioSO Flow (VOCO) as the base material in combination with the thermoviscous composite VisCalor bulk as the bulk-fill material.

### Case description

#### Medical history

- **Patient's age and sex**

The female patient was 30 years old at the time of treatment.

- **Reason for visiting dentist**

Multiple Class V cervical lesions not damaged by caries and inadequate fillings.

- **General and particular medical history**

At the time of treatment, the patient appeared to be in good health overall. There was no evidence of systemic conditions. The patient said she smoked 10 to 20 cigarettes per day. She did not report any toothaches.

- **Patient's expectations**

The patient wished to have the cervical lesions treated and her "beautiful, healthy teeth" restored.

### Findings and diagnosis

- **Clinical and instrumental findings**

The intraoral examination identified old, inadequate composite restorations in teeth 12 and 13, which had originally been inserted to treat cervical caries. A further cavity in the cervical region of tooth 14 was also diagnosed. The examination of the periodontium reflected the findings – gingivitis with probe depths of  $\geq 3$  mm was identified in some regions of the gingiva.

The panoramic radiograph confirmed the clinical findings described above in teeth 12–14 in the scope of the radiological diagnostics.

- **Diagnosis**

Active C2 caries in tooth 14, mild gingivitis, additional cervical lesions in teeth 12 and 13, stains from tobacco consumption.

### Treatment

- **Treatment plan**

- Professional cleaning and polishing with non-surgical scaling and root planing
- Briefing about the risks of smoking
- Replacement of inadequate Class V fillings and treatment of lesions in teeth 13–14
- Tooth 12 is to be treated in a separate, subsequent session
- Application of a desensitising agent as a dressing following preparation
- Assessment prior to bleaching and after two months
- Follow-up care after 6 months

- **Sequence of treatment steps with products (and manufacturer) in text**

- Removal of old fillings and optimisation of prepared cavities (Komet Dental)
- Isolation of operating site with rubber dam (Hygienic Dental Dam, Coltene; dental floss, Oral-B)
- Etching with 37 % phosphoric acid (Conditioner 36, DeTrey)
- Rinsing and drying
- Desensitising and dressing (Telio CS, Ivoclar Vivadent)
- Adhesive (Prime&Bond XP, Dentsply) both tooth 13 and tooth 14
- 10-second light-curing of adhesive layer (Mini LED Active, Acteon)
- Cavity liner on teeth 13–14 (GrandioSO Light Flow, shade A3, VOCO) and subsequent restorative treatment with bulk restoration of same teeth (VisCalor bulk, shade A3, VOCO)
- Sculpting of restorations
- 20-second light-curing of composite filling (Mini LED Active, Acteon)
- Preventive measure against formation of an oxygen inhibition layer (glycerine, Comed)
- 10-second light-curing (Mini LED Active, Acteon)
- Rinsing off of glycerine
- Finishing and polishing of restorations (Sof-Lex, 3M)
- Final visual assessment

## Result

- **Before-and-after comparison**

The treatment and production of the restorations in the affected teeth taking the function and aesthetics into consideration took around 30 minutes. As the patient was primarily concerned with the appearance of the restorations and her smile, the re-treatment with an invisible restoration exceeded her expectations. As a result, she agreed to have tooth 12 retreated.

## Discussion

- Class V restorations require particular attention to the anatomy of the tooth. In order to be able to preserve the biological width, a technology should be used which allows light-curing of restorations with a thickness of up to 4 mm (bulk technology). The use of a thermoviscous bulk-fill composite (VisCalor bulk, VOCO) was thus the method of choice, as the material characteristics make it possible to recreate the tooth in one treatment step with both the correct convex shape and a smooth surface. At the same time, the chair time was correspondingly short as for a routine operation.

In the case described here, the use of a desensitising agent as a dressing as well as additional rinsing and drying were essential in order to avoid postoperative sensitivity.

A neutrally coloured glycerine gel (Comed) was used during the light-curing of the composite restorations in order to prevent the formation of an oxygen inhibition layer. An oxygen inhibition layer in connection with a composite is a thin, adhesive film around 50 µm thick which forms on the surface of a restoration if it does not cure completely. This oxygen inhibition layer forms when the composite comes into contact with oxygen during the curing. For this reason, the oxygen-impenetrable protection gel can be used to prevent exposure of the composite surfaces to oxygen. As the glycerine slightly increases the distance between the tip of the light-curing device and the restoration, each of the restorations where the shade A3 is used is initially light-cured for 20 s with the LED curing light (light intensity > 1,000 mW/cm<sup>2</sup>). The curing time is extended by a further 10 s in order to balance out the effect of the greater distance. The glycerine gel was removed with the water jet prior to the finishing and polishing. This produced a harder composite surface, which was easier to finish.

Alternatively, it would have also been possible to leave a little excess material and remove the uncured oxygen inhibition layer in the course of the finishing. Ultimately,

the smoothly finished surface contributes to avoiding future accumulation of plaque, caries and discolouration. It will also ease teeth cleaning for the patient.

- **Particular advantages of VOCO products used**

VisCalor bulk – This particularly innovative material was employed as a deep bulk filling in the first right upper premolar in one treatment step. The corresponding dispenser (VisCalor Dispenser, VOCO) warms the material to 65 °C in just 30 s and keeps it warm for 2.5 minutes. When using pre-warmed composite caps, the user may feel under pressure to complete the step in time before the material hardens. In contrast, VisCalor bulk allows sculpting of the restoration without any time restrictions. In addition, the thermoviscous composite can also be polished without any problems.

GrandioSO Light Flow (VOCO) – The user-friendly tip made application of the material easy and there was no formation of bubbles thanks to the good adaptation.

### Conclusion

- **Patient satisfaction**

5/5 for a pain-free procedure

User satisfaction: Subjectively only 4/5, as the dentist is self-critical of not having changed the isolation of the operating site in the form of a rubber dam in order to cover the gingiva papilla between teeth 12 and 13 as well.



Fig. 1: Clinical situation before treatment



Fig. 2: Preparation of the cavity



Fig. 3: Isolation of the teeth with rubber dam



Fig. 4: Etching of teeth with 37% phosphoric acid



Fig. 5: Cavity following etching, rinsing and drying



Fig. 9: Application of the bulk filling into the cavities prior to sculpting



Fig. 6: Application of desensitising agent as dressing



Fig. 10: Sculpting of the restorations



Fig. 7: Application of the adhesive into prepared cavities



Fig. 11: Application of a glycerine gel to prevent formation of an oxygen inhibition layer



Fig. 8: Application of a flowable composite as a liner



Fig. 12: End result following finishing and polishing

### Further reading

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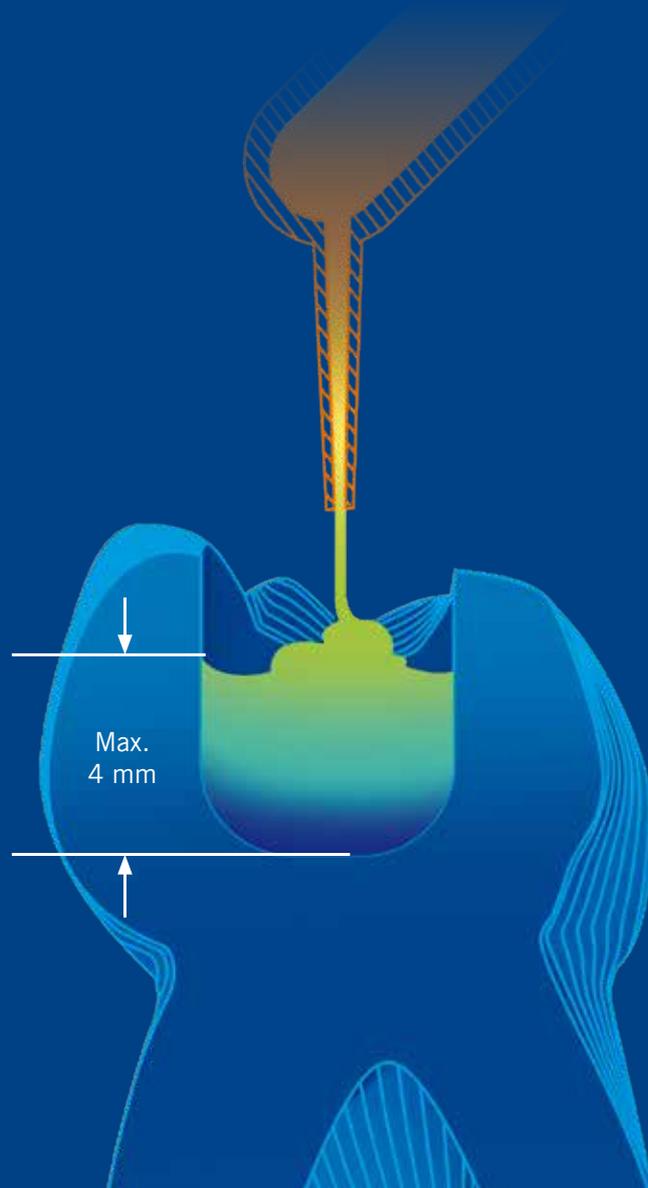
Les Sables-d'Olonne (France)



## VisCalor bulk

*“The viscosity change of the material from flowable to packable during one working step is certainly to be classified as a worldwide innovation. VisCalor bulk is an easy to handle filling material. It is efficient for the dentist as it enables short treatments. With a volume shrinkage of only 1.44 Vol.-% and a shrinkage stress of 4.6 MPa VisCalor bulk shows lower shrinkage values than conventional bulk-fill composites after warming.”*

*Gianfranco Roselli, DDS*



## VisCalor bulk

Thermoviscous bulk-fill composite

REF 6062 Set VisCalor Dispenser  
Caps 80 × 0.25 g (16 × universal,  
16 × A1, 16 × A2, 32 × A3),  
VisCalor Dispenser

REF 6063 Set Caps Warmer,  
Caps 80 × 0.25 g (16 × universal,  
16 × A1, 16 × A2, 32 × A3)  
Caps Warmer



	universal	A1	A2	A3
Caps 16 × 0.25 g	6065	6066	6067	6068



### High quality and durable

- Optimal flowing to margins and undercut areas
- Excellent physical properties

### Unique and innovative

By pre-warming, the material is flowable during application and can be sculpted immediately afterwards (thermo-viscous-technology)

### Efficient

- Combines 2 viscosities in one material ▶ no material change and less stock keeping
- No overlaying necessary

### Excellent handling

Bubble-free application with a narrow and long cannula

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