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the No.1  
even better!



**PATTERN RESIN**  
from **GC**  
Low Shrinkage Modelling Resin

**TIPS & TRICKS**  
Technique and Handling of  
GC Pattern Resin

**GC**

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## Introduction

Contemporary materials, equipment and techniques enable dental technicians to manufacture high precision, aesthetic restorations – and naturally they prefer procedures, which are clear, easy to learn and safe to apply. In this context, accessory materials, which may at first glance appear unimportant, have in fact become absolutely indispensable.

Dental prostheses are as individual as the patients. It takes real teamwork to achieve perfect technical results and genuine satisfaction for patients. An exact transfer of intraoral situations to the laboratory using precise and reproducible laboratory methods makes the team-oriented interaction of dentists and dental technicians easier. "Little helpers", such as a universal high precision modelling resin are invaluable for these procedures.

# GC Pattern Resin LS

## Low Shrinkage Modelling Resin



**For a perfect touchdown**

### A modelling resin with unique properties

In more than 15 years of service to the dental and dental technician professions Pattern Resin LS Low Shrinkage modelling resin has proven a safe, versatile and easy to handle material. Pattern Resin LS was specially developed for the brush technique. Its unique handling properties make it suitable for as different indications as attachment, crown and bridge, implant and electroforming techniques.

Pattern Resin LS is further well established and proven for a number of detail applications – such as resin dies, fixation prior to soldering or milling, or core build-ups. Our aim is to enable you to take full advantage of this unique material. The present manual lists some of the numerous chairside and laboratory indications and provides you with application examples from various fields of dental technology.

Take a look inside to learn some new Applications, Tips & Tricks with Pattern Resin LS.

# Indications

Attachment technique	Conical or telescopic crowns Bars Custom attachments Resin dies Fixation of crowns for transfer impressions
C&B technique	Inlays, onlays Adhesion bridges (Maryland)
Soldering	Splinting for soldering procedures
Model cast partial dentures	Modelling of extensions, lingual bars and clasps
Implant technique	Manufacture of custom implant abutments Implant bite registrations Intra-oral splinting of transfer abutments Superstructures
Electroforming (Galvano)	Resin dies for electroforming technique

# Features and Benefits

Features	Benefits
Low polymerization shrinkage	Perfect fit of the pattern and the cast object
Perfect handling properties for brush technique	Easily controlled and precise application Even large extensions can be built up without problems Quick setting, but convenient application with brush technique Economical usage
Favourable flow behaviour and high wettability	Easy workability Does not flow from applied areas Homogeneous resin workpieces Optimally adapted to brush technique Efficient and economical
Burns out without residues	Homogeneous castings
High hardness and strength	High stability even in thin layers Fine surface adjustments can be made with burs Smooth surfaces after grinding or milling
Short setting time	Time-saving and economical, also for mixing technique
Perfect adhesion to already polymerized Pattern Resin LS	Homogeneous, smooth casting surfaces with precise margins
Unlimited dimensional stability of Pattern Resin LS dies	Dimensionally stable dies even after hours or days No dimensional changes due to room temperature

## Physical properties

Working time (23° C)	2-3 min
Setting time (23° C)	4 min
Flexural strength (37 °C, after 10 min)	63 MPa
Polymerization shrinkage after 30 min	0,36 %
Polymerization shrinkage after 24 h	0,37 %

## Chemical composition

Powder:	Polymethylmethacrylate
	Polyethylmethacrylate
	Dibenzoyl peroxide
Liquid:	Methylmethacrylate
	2-Hydroxyethyl-Methacrylate

## Brush Technique – Packaging

The 1-1 package of Pattern Resin LS contains everything you need for the brush technique: 2 mixing cups, 1 brush, 1 pipette for exact liquid dosage, and Pattern Resin LS powder and liquid to be mixed in suitable ratios.

Pattern Resin LS  
Low Shrinkage Modelling Resin  
1-1 Pack: 100 g Powder,  
105 ml Liquid

Accessories:  
2 Mixing Cups,  
1 Brush No. 4,  
1 Pipette



# Brush Technique – Step by Step

1. Mix powder and liquid:  
Dispense adequate amounts of powder and liquid into the respective mixing cups.

*Tip:* The pipette helps to dispense the exact amount of liquid.



2. Slightly moisten the brush.

*Tip:* Squeeze out excess moisture by pressing the tip of the brush on the inner wall of the mixing cup. This also creates a finely pointed tip.



3. Pick up a small amount of Pattern Resin LS powder with the moist brush.

Due to the material's thixotropic properties, a small resin bead will form on the tip of the brush.



4. The resin bead remains stable on top of the brush and is ready e. g. for modelling of secondary crown patterns.



5. Deposit the resin bead on the metal surface of a primary crown.

Working time: 2-3 min  
Setting time: 4 min

*Tip:* No separating agent is needed on smooth metal surfaces.



6. *Tip:* To clean in between times - dip the brush into Pattern Resin LS liquid and dry with a tissue.



7. Repeat the above procedure to cover the whole surface with a thin layer of Pattern Resin LS.

*Tip:* As fresh Pattern Resin LS adheres perfectly to already polymerized material separate small dots can easily be connected.



8. Even where high precision is required, e. g. at primary crown margins, Pattern Resin LS exhibits perfect flow and fit.



9. After polymerization of Pattern Resin LS carefully remove the pattern to check the internal surface.

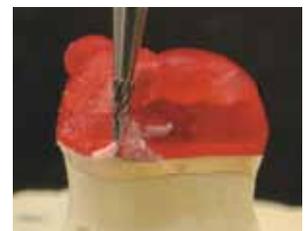
*Tip:* Small retentions help to remove the pattern from the primary crown.



10. The inside of the pattern shows the same glossy surface as the primary crown.



11. Place the pattern back on the primary crown and make fine adjustments with a suitable grinding instrument (e. g. cross-cut tungsten carbide).

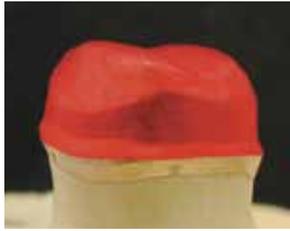


12. Evenly reduce the thickness of the pattern to 0.3 - 0.4 mm and check with a calliper. Also check the margins.

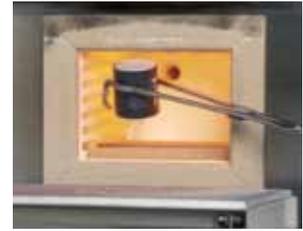


# Brush Technique – Step by Step

13. Place the pattern back on the primary crown.



19. Heating-up is carried out according to the schedules given in the instructions for use. Cast in the usual manner.



14. Prepare the wax-up using an appropriate inlay wax. Check occlusion, contact area and contour as usual.



20. Deflask in the usual way and clean the cast metal surface with glass beads.



15. The wax-up is ready for connection of the sprues.



21. Check the inner surface carefully and remove inaccuracies with an appropriate grinding instrument.



16. Connect the sprues according to the casting system and method used.



22. The inside of the secondary crown shows a homogenous, glossy finish.



17. Position crown in the casting ring.



23. The secondary crown fits perfectly on the primary crown.



18. Mix and pour phosphate-bonded investment (Fujinvest Super, Stellavest or Fujinvest II) according to the instructions for use.

*Tip:* Investing Pattern Resin LS workpieces always requires a greater proportion of investment liquid than wax patterns. For detailed information refer to the respective instructions for use.

Photographs: ZTM V. Brosch

# Implant Restorations

Some examples for the use of Pattern Resin in implantology:

## Case 1

1. Step-by-step build-up of an implant suprastructure with Pattern Resin LS.



2. Suprastructure with integrated horizontal screw threads. Further crown build-up will be carried out with modelling wax.



3. The high precision fit of the cast suprastructure manufactured with the aid of Pattern Resin LS is immediately evident.



## Case 2

Example of a technique for passive transfer of the intra-oral situation to the working die.



## Case 3

1. Maxillary transfer template after intra-oral connection of the transfer abutments with Pattern Resin LS. Implant analogues are already inserted for preparation of the working die.



2. The transfer template on the working die.



3. The implant analogues have been fixed with Pattern Resin LS and cast-on titanium tubes screwed into the analogues prior to manufacture of the superstructure



4. Pattern Resin LS buildup as a preparatory step for the manufacture of the superstructure



5. Reduced Pattern Resin LS frame as a stabilizing basis for the superstructure.



## Further examples:

Intra-oral splinting of transfer abutments



Transfer of the intra-oral positions of ceramic abutments.



Customized abutment made of Pattern Resin LS ready for CAD/CAM technique (left). Milled zirconium abutment (right).



# Electroforming Restorations

PATTERN RESIN LS

In connection with electroforming technology Pattern Resin LS has been successfully applied in several indications:

1. Electroformed die made of Pattern Resin LS, with stainless steel screw as a removal aid
2. AGC® electroformed coping after gold deposition.



3. Removal aid made of Pattern Resin LS, for easy removal of the metal coping to avoid deformation.



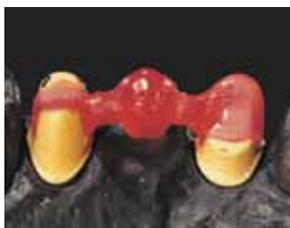
Electroforming in connection with bridge techniques:

1. Tension-free pontic shaped with Pattern Resin LS, for galvano cast-on technique.



2. Occlusal view of a posterior bridge.

(For technical details please refer to "AGC® Galvano technique" instructions for use)



Photographs: Wieland Dental + Technik, ZTM C. Gadau

# Core build-up

Core build-up of a molar crown, prior to preparation.



# Telescopic bridges

Pattern Resin LS secondary crowns for a telescopic bridge.



The cast metal structure.



Completed restoration.



Photographs: ZTM V. Brosch

# Investing and casting

## Mixing ratios:

When investing Pattern Resin LS workpieces, always use a higher proportion of investment liquid than with wax patterns. For details please refer to the instructions for use of the respective phosphatebonded investments.

## Modelations:

All Pattern Resin LS workpieces should be covered with a thin layer of wax to avoid deterioration of the investment surface during heating-up.

## Heating-up:

In connection with larger Pattern Resin LS workpieces, heat up progressively to avoid aggressive burning out. It is recommended that the temperature is kept at 250° C for 1 hour before raising to the final burn out.

# Questions and answers

## 1. Should I insulate the surface of the primary component before building up Pattern Resin LS?

Insulation of the primary component is not required if Pattern Resin LS is used on a smooth, milled metal surface.

## 2. How can I tell that I am using the right mixing ratio of powder and liquid for the brush technique?

After dipping the wet brush into the powder, the little bead on the tip of the brush should be slightly wet and have a shiny surface.

## 3. Which burs are recommended for adjustments of the polymerized Pattern Resin LS surface?

For adjustments or milling use tungsten carbide burs or cross-cut instruments.

## 4. Can I mill the surface of Pattern Resin LS in the same manner as wax?

Dies and workpieces made of Pattern Resin LS can be shaped, contoured and milled by means of a milling machine.

## 5. Which steps should I observe when I use Pattern Resin LS on stone dies?

Check the stone die, stumps or cavities for undercuts, inaccuracies or rough surfaces. Block-out undercuts with an appropriate wax and seal the die surface with Die Hardener. Wet the cavity or stump surfaces with a separating agent.

## 6. In connection with the brush technique, can I apply Pattern Resin LS in small dots?

Pattern Resin LS can be built up in small sections or dots. Each section will polymerize separately and adhere to the other sections. After covering the complete base, Pattern Resin LS shows a homogenous surface. This technique minimizes total polymerization shrinkage.

## 7. How can I clean the brush?

For intermediate cleaning dip the brush into Pattern Resin LS liquid and dry with a tissue.

## 8. How can I remove a secondary pattern from the primary component in a safe and easy way?

Small opposing retention beads attached to the surface help to remove the pattern.

## 9. Should I treat Pattern Resin LS objects with a wetting agent before investing?

Generally, the quality of casting surfaces depends on the use of a wetting agent. However, if Pattern Resin LS is applied on smooth or polished metal surfaces without undercuts, there is no need to use a wetting agent. If there are wetting agent residues the internal surface of the cast restoration will not be smooth.

# Related Products



**GC Fujirock EP**  
Type 4 Dental Stone

The superior quality Type 4 Dental Die Stone is ideal for all kinds of prosthetics, with high precision, outstanding edge hardness and high-pressure stability. Thus a precise model as a basis for precise prosthetics is achieved.



**GC Fujivest Super**

The carbon-free phosphate-bonded investment for precision castings of precious, semi-precious and Pd-base alloys, with special attention to complicated implant castings. Fujivest Super can be used in both quick heating and slow heating procedures.



**GC Fujivest Premium**

Exact solutions for flexible needs: Fujivest Premium, crown & bridges casting investment, suitable for all types of dental alloys with special attention for non-precious alloys: versatile and robust.



**GC Casting Liner**

A special ceramic-fibre liner to allow a free expansion of all investments.



**GC Fujivest II**

A carbon-free phosphate-bonded investment for precision crown and bridge castings of all dental alloys, including Ni-Cr and Co-Cr.



**GC Fujivest Platinum**

Exact solutions for the highest demands: Fujivest Platinum, investment material for precious and semi-precious alloys: highly precise castings, offering consistent top quality.



**GC Fitchecker I**

White and black easy-flowing C-silicone for checking the accuracy of dentures, crowns, bridges, precast posts & inlays.



**GC Fit Checker II**

White A-silicone material, especially for checking pressure spots and the fit accuracy of crowns, bridges, precast posts, inlays & dentures.



**GC Fujirock OptiXscan**

With CAD/CAM & implant technologies gaining importance every day, GC has developed a special type 4 stone. Thanks to its specially adapted powder composition Fujirock EP OptiXscan is compatible with all existing scanning devices.



**GC Fujirock OptiFlow**

Thin flowing Type 4 Dental Stone for basing Fujirock EP arches. The 4 colours - Terracotta Red, Dynamic Purple, Peppermint Green and Sapphire Blue - meet the requirements for the individualised and aesthetic construction of master models. An optimal combination is achieved in conjunction with the four colours of Fujirock EP.

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