

# A practice-based evaluation of the handling of Shofu Beautiful Flow Plus

BeutiBond

F J Trevor Burke, Russell J Crisp, Peter Sands and Norman Tulloch present a report evaluating the in-practice handling and use of Shofu Beautiful Flow Plus, a resin-based restorative material based upon giomer technology

## Practice-based research

The importance of practice-based research has been emphasised by Mandel (1993), who considered that: 'Research is not only the silent partner in dental practice, it is the very scaffolding on which we build and sustain a practice'.

Central to good performance of dental materials are not only their physical properties, but also their ease of use, since it could be suggested that a device or restorative that handles easily will be more likely to produce an optimally performing restoration than one that is difficult to use. The assessment of the handling of a new material, or a revised version of an older one, is therefore of importance. In this regard, the performance of a restorative material by one operator is necessarily subjective, but when practitioners band together to form a group in order to assess the handling of new materials in dental practice, the results are likely to be more objective and generalisable. All of this is possible when practitioner-based research groups are teamed with the expertise available in academic institutions. A UK-based group of practice-based researchers is the PREP (Product Research and Evaluation by Practitioners) panel. This group was



Figure 1: Syringes of Shofu Beautiful Flow Plus in two different consistencies



Figures 2a and 2b: Class V restoration 23. Clinical case by Dr Norman Tulloch (Alass, Scotland)

established in 1993 with six general dental practitioners, and has grown to contain 33 dental practitioners located across the UK, with one in mainland Europe. The group have completed over 60 projects – 'handling' evaluations of materials and techniques and, more recently, clinical evaluations (n=6) of restorations placed under general dental practice conditions, with the restorations being followed for periods of one year and five years.

## Resin composite materials and gomers

Resin composite materials are the mainstay of direct-placement aesthetic materials for anterior and posterior teeth. One group of these are the gomers, based on the patented technology developed by Shofu. In short, these giomer materials are a category of hybrid restorative materials. With the hybridisation of glass ionomers and resin, there are ranges of handling and physical properties that, in combination, are found in no other restorative group. Shofu gomers use PRG (pre-reacted glass technology) that enables not only fluoride release, but continuous release through recharge. This in itself offers protection against secondary caries, as confirmed in previous clinical study.

Beautiful Flow Plus is a giomer material in an injectable form, available in two viscosities (Figure 1). This material has been approved for all classifications from class I to class V, including class II restorations.

It is therefore the aim of this paper to evaluate the

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**Figures 3a and 3b:** MOD with cuspal replacement 14. Clinical case by Dr Peter Sands (Abingdon, England)

in-practice handling and use of Shofu Beautiful Flow Plus, a resin-based restorative material based upon giomer technology.

## Methods

Explanatory letters, questionnaires and packs of Beautiful Flow Plus and BeautiBond were distributed in September 2011. Full instructions and an explanatory document on giomer technology were also sent. The practitioners were asked to use the materials and return the questionnaires. Ten members, whose average time since graduation was 23 years ago (ranging from 10 to 38 years), were selected at random from the PREP panel.

## Clinical evaluation of Shofu Beautiful Flow Plus: initial evaluation

All (100%) of the evaluators had previously used a traditional flowable composite or a flowable compomer, using these in class I cavities (five evaluators), class III cavities (four evaluators), class V cavities (six evaluators), and as a base under a resin composite restoration in posterior teeth (eight evaluators).

Other uses included the bonding fibre-dontic splints, as a fissure sealant and for repair of minor composite restoration defects. However, this is background information and should not be confused with the actual clinical use of Beautiful Flow Plus in this evaluation, which is reported below.

The ease of use of the traditional flowable composite that they currently used, (ie, not Beautiful Flow Plus) was rated as:



Reasons given by the evaluators for difficulties with their current flowable composite (ie, not the new Shofu Beautiful Flow Plus) included: 'Needs to be quick or it flows out of position!' and 'Not always easy to use and sometimes bubbles present in application.'

The evaluators were then asked to rank in importance (from most important = 1, to least important = 10) a number of attributes and benefits of the new Beautiful Flow Plus, with the results being presented in the table below.

Attribute	Average score	Range	Overall rank
Giomer PRG technology - 67% filled. Glass inomer and resin combined hybrid	5.3	1 - 9	6=
Injectable - easy to use, even in hard areas, with no bubbles. Ideal for MICD	2.4	1 - 7	1
A universal restorative for class I to V, anterior and posterior	4.1	1 - 9	4=
Highly aesthetic	2.7	1 - 5	2
Multiple viscosities providing controlled handling	3.8	2 - 7	3
Radiopaque - 15% higher opacity than enamel	5.8	1 - 9	8
Syringe design to prevent weeping	6.3	1 - 10	9
Competitive price and cost effective in use	5.3	1 - 9	6=
Ease of use	4.1	1 - 7	4=
Part of, and extending, a complete range of the Beautiful 11 system	7.7	1 - 10	10

The evaluators were asked to rate the presentation of the Beautiful Flow Plus kit in terms of:

a) Completeness of understanding what the material will do and how it can be used:

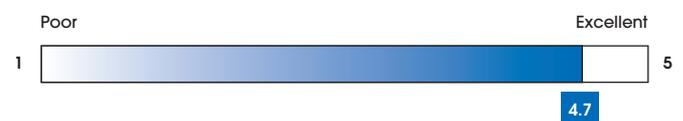


b) Overall presentation:



Comment: 'The "wings" on the syringe prevented the correct use of my cross-infection control "sheaths".'

The instructions on the back of the box were rated as follows:



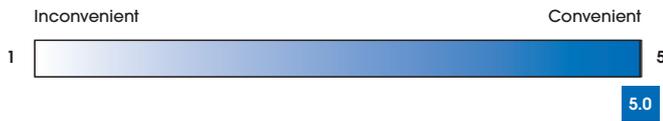
All of the evaluators stated that the syringes for Beautiful Flow Plus worked well, with the following comments: 'Excellent - loved the product' and 'Very good'.

All the evaluators stated that the design of the syringe to prevent weeping was satisfactory.

## Clinical use of Beautiful Flow Plus

The total number of Beautiful Flow Plus restorations placed was 354, comprising 90 class I, 59 class II, 55 class III, 12 class IV and 138 class V, with the majority of class I and V restorations being placed freehand, while matrices were used for class II, III and IV restorations.

When the evaluators and their dental nurses were asked to assess the dispensing and placement of Beautifil Flow Plus, the result was as follows:



Nine of the evaluators (90%) stated that they liked the fact that the Beautifil Flow Plus materials were not traditional flowables and that they were available in two consistencies.

Comments included: 'I noticed little difference in the flow consistencies'.

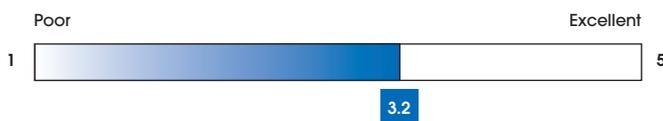
All (100%) stated that they understood the differences between these consistencies and understood their different uses, as illustrated in the brochure.

The viscosity of the two materials was rated by the evaluators as follows:

a) F00 material:



b) F03 material:



Nine (90%) of the evaluators stated that the restorations were easily finished and polished using the supplied polishers.

Comments included: 'Very good polishers' and 'Didn't polish many – mainly very small restorations and left unpolished'.

All (100%) of the evaluators stated that the materials polished to a high gloss.

When the evaluators were asked if they would like to see additional shades of Beautifil Flow Plus in addition to those currently available, 50% (n=5) stated that they would, with the comment, 'C shades please'.

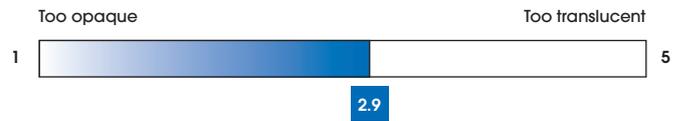
When the evaluators were asked to rate the overall aesthetic quality of the Beautifil Flow Plus restorations, the result was as follows:



When the evaluators were asked to detail any difficulties experienced during the placement and finishing of the restorations of Beautifil Flow Plus, the following comments were made:

- 'The material is very hard, which can make finishing difficult but it polished to a high gloss'
- 'Ensuring good interproximal contacts'
- 'No problems – easy to work with' (five similar).

The evaluators rated the material for translucency/opacity as follows:



The ease of use of Beautifil Flow Plus was rated as follows:



Comments included: 'Excellent system in all applications' and 'Liked the adjustable/spinning part of the syringe'.

When the evaluators were asked if there were any changes they considered essential to the acceptability of Shofu Beautifil Flow Plus, the following comments were made:

- 'None' (four evaluators)
- 'Material shade guide for high end aesthetic work'.

All (100%) of the evaluators stated that they would purchase the material if available at average cost. The sectional diagrams in the brochure were stated to be useful by all (100%) of the evaluators. Comments:

- 'Pictures very useful as an aid when starting to use the product'
- 'Made it simple'.

Final comments included:

- 'The material looked and polished fantastically'
- 'I loved the material, syringe, aesthetic and function'
- 'Excellent flowable composite with great handling and appearance. Very impressed'
- 'Excellent material and very easy to use. Two nurses volunteered to have restorations in the material and they were very impressed with the aesthetics'
- 'I really loved this material. Time will tell re: long term results' (two similar)
- 'Even though the 00 material is flowable it does not slump'
- 'A practical and useful improvement to the range of aesthetic materials'
- 'Very good material – I would strongly recommend to other dentists'
- 'Using fine tips it is possible to access very minimal and/or interproximal cavities'
- 'Excellent material'.

## Discussion

The Shofu Beautifil Flow Plus restorative system has been subjected to an extensive evaluation in clinical practice, in which 322 restorations were placed by members of the PREP panel.

The presentation of the material and the instructions scored very highly (4.8 and 4.9) on a visual analogue

## Materials and equipment

scale where 5 = excellent and 1 = poor). Beautifil Flow Plus was rated as significantly better by the evaluators for ease of use when compared with the normally used flowable composite system, (4.4 v 3.9 on a visual analogue scale where 5 = easy to use and 1 = difficult to use).

A near ideal score for viscosity (3.3 and 3.2 a visual analogue scale where 5 = too viscous and 1 = too thin) was achieved by the F00 and F03 materials respectively. The score achieved for translucency/opacity was also very close to the ideal score (2.9 on a VAS where 1 = too opaque and 5 = too transparent).

Notably, two maximum scores were achieved in this evaluation, which is unique. The first was for the assessment by the evaluators and their dental nurses of the dispensing and placement of Beautifil Flow Plus. The second was for the aesthetic quality of the restorations of Beautifil Flow Plus.

### Conclusion

The excellent reception of the Shofu Beautifil Flow system was underlined by the fact that all the evaluators would purchase the material if available at average cost and the unsolicited positive comments that were made.

### Acknowledgments

The authors thank Shofu UK for funding this evaluation, and thank the participating members of the PREP panel for completing the questionnaires. [PD](#)

### Reference

Mandel ID (1993) Clinical research – the silent partner in dental practice. *Quintessence Int.* **24**: 453-463

#### Manufacturer's comments

Shofu wishes to thank the PREP panel for their comprehensive evaluation of Shofu Beautifil Flow Plus and the results from UK based clinicians mirror the response from clinicians around the globe, who are really excited by Beautifil Flow Plus and the benefits and application of these innovative Giomer materials. Manufacturer's details: Shofu UK, Riverside House, River Lawn Road, Tonbridge, Kent TN9 1EP. For further details, please call 01732 783580.