

GrandTEC Test Kit

Dear User,

This Test Kit has been put together to enable you to test GrandTEC on the model before using it in a clinical situation. GrandTEC is a resin-impregnated glass fibre strip.

The Test Kit contains:

- 5 GrandTEC strips
- GrandioSO Heavy Flow, 2 × 2 g, A3 shade
- Silicone application aids: GrandFix round
GrandFix long
- Metal application aids: retaining clasps for fixating GrandTEC
- Working model for testing three different clinical situations

The following clinical situations, which you can treat with the help of GrandTEC, have been prepared on the model:

1. Splinting teeth 33-43 (preparation is not available on the model)
2. Gap closure and replacement of the missing tooth 35 with directly modelled bridge region 34-36
3. Replacement of the missing tooth 45. The neighbouring teeth have not been prepared. The situation simulates the closure of a gap left by a missing tooth

The situations replicated on the model simulate common clinical cases that cannot be treated by using composites alone but can probably be treated by the combined use of GrandTEC and composite (e.g. the high performance material GrandioSO).

General information/precautionary measures:

Follow the enclosed instructions for use for GrandTEC and GrandioSO Heavy Flow.

Never use a self-etching bonding agent when using glass fibres in the dental adhesive technique.

We recommend that the dental hard tissue should normally be mechanically roughened before it is conditioned e.g. with a preparation diamond of medium roughness.

The silicone and metal aids for adapting GrandTEC (respectively “GrandFIX round” and “GrandFIX long”, and “GrandTEC wire spring”) can easily be cleaned after use with isopropyl alcohol.

Additional work steps and instructions which relate to clinical situations or which differ on the model from the clinical situation are identified by a different font and font size as used in this paragraph.

Case 1

Splinting teeth 33-43

GrandTEC creates a bond with a very high strength value on conditioned tooth surfaces when used in conjunction with the composite GrandioSO Heavy Flow. GrandTEC is therefore highly suitable for splinting teeth after orthodontic treatment, traumas or as part of a periodontitis therapy.

- 1.1 In order to splint teeth 33-43 on the model you must firstly determine the required length of the GrandTEC strip. This can be done by measuring the length with a piece of wax wire or WedJet®. With the GrandTEC strip still in its protective foil, shorten it to the length you measured with the wax wire or WedJet® or the like.

In the clinical situation the dental hard tissue would now be mechanically roughened if required and the tooth surfaces etched and bonded after measuring the length of the GrandTEC strip. Particular attention should be given to the interdental spaces. There is a possibility that the composite could get into the interdental walls and completely seal the interdental spaces. Its subsequent removal would then prove to be a difficult and time-consuming process. This situation could occur even when using GrandioSO Heavy Flow, even though this composite has ideal flow properties in combination with glass fibres. In view of this possibility we strongly recommend the use of interdental wedges or short WedJet® pieces placed interdentally to prevent the composite flowing into the interdental spaces. These steps have been omitted on the model as it has not been possible to replicate them in that setting.

- 1.2 Apply a small amount of GrandioSO Heavy Flow to each of the lingual surfaces of teeth 33-43 and place the previously shortened GrandTEC strip onto the flowable composite.
- 1.3 Use one of the metal clasps for each interdental space in order to adapt the GrandTEC fibres to the lingual surfaces and into interdental spaces, placing the clasps tooth by tooth in succession from one side to the other and not on both sides at once. This will prevent the formation of a “bulge” and GrandTEC will lie closely against the tooth surface.
Alternatively, you can use the silicone aids enclosed with the kit which enable the glass fibre strips to be accurately adapted and pressed on.
Bear in mind that GrandTEC is impregnated with light-curing resin. You should therefore carry out the work steps promptly because even ambient light can initiate polymerisation.
- 1.4 Polymerise the GrandTEC strip fixated as above and GrandioSO Heavy Flow in sections, covering the remaining sections with a dental mirror for example. This will make it possible to correct these areas before polymerisation if necessary. Exercise particular care with the start and end of the GrandTEC strip. These should also lie closely against the tooth and not project freely into the oral cavity. This will avoid unnecessary additional work and a possible club-shaped swelling at the start or end of the glass fibre strip, which in this case is located distally from tooth 33 or 34 respectively.
- 1.5 After fixating the strip, firstly remove the retaining clasps. Then apply GrandioSO Heavy Flow to the GrandTEC strip and distribute the composite with a disposable brush or a Heidemann spatula for example. This will also seal the small holes formed after removing the retaining clasps. The flowable composite must always completely cover the GrandTEC strip. Then polymerise the GrandTEC strip again in sections.
That concludes the first test application of GrandTEC apart from any finishing or polishing that may be required.

Case 2

Gap closure and replacement of the missing tooth 35 with directly modelled bridge region 34-36

Teeth 34 and 36 bordering the gap have prepared cavities occlusally-distally or mesially-occlusally. The gap itself is sealed with a pontic made of composite on a GrandTEC strip.

- 2.1 Firstly, measure the distance between the two teeth, using a piece of WedJet® or preferably in this case a piece of wax wire.
For reasons of stability the GrandTEC strip must run in an arch shape between the teeth bordering the gap and should cover the whole of the floor of the prepared cavities in teeth 34 and 36. By measuring accurately you will save yourself having to make unnecessary corrections to the GrandTEC strip. The GrandTEC strip can touch the gingiva in a punctiform manner. In the clinical situation the strip would lie in the mouth on a rubber dam or another gingival protector, e.g. a matrix band cut to size made of plastic foil, and thus have no direct contact with the gingiva.
- 2.2 With the GrandTEC strip still in its protective foil, shorten it to the length you measured with the wax wire or WedJet® or the like.

Condition the cavities of the teeth bordering the gap with phosphoric acid and a bonding agent. This step is omitted on the model.

- 2.3 Wet the floor of the cavity of the tooth 34 with GrandioSO Heavy Flow and position the previously shortened GrandTEC strip with one end in the cavity.
- 2.4 Cover the parts of the GrandTEC strip lying distally of the cavity with a dental mirror or the like and polymerise the area of the cavity only briefly for approx. 5 seconds. This will create a bond between the GrandTEC strip and the flowable composite with the model.
- 2.5 Now wet the molar cavity with GrandioSO Heavy Flow.
Then form the GrandTEC strip into an arch shape that rises again to the molar cavity and ends on the floor of the cavity.
Ensure that the GrandTEC strip is in an arch shape in the gap. Then polymerise the GrandTEC strip and the flowable composite initially in the molar cavity for at least 20 seconds and again in the premolar cavity.
- 2.6 Now wet the GrandTEC strip with a thin layer of GrandioSO Heavy Flow, distribute it with a brush and then polymerise the GrandTEC strip in sections.
- 2.7 In the next step fill the cavities of 34 and 36 with composite and model both occlusal surfaces. The final light polymerisation of the modelled occlusal surfaces concludes this step.
- 2.8 Now model the tooth in the gap, beginning with a little packable composite, e.g. GrandioSO, positioned in the form of a tag distally of the deepest point of the GrandTEC arch and immediately light cure. Position a further “tag” of light-curing composite mesially alongside and polymerise this as well. Now build up the tooth 35 little by little with further small portions and polymerise the composite after each step. Small amounts of GrandioSO Heavy Flow distributed with a brush help to close the gaps between the individual increments and give the tooth its shape.
Note the basal shape of the replacement tooth: its gingival width should not be exceed that of the GrandTEC strip (\cong approx. 2 mm) in order to facilitate cleaning and conserve the gingiva.

In the clinical situation the occlusion check and polishing are now carried out as a final step in the mouth. Use the same abrasives for this as you would use for your composite restorations.

Case 3

Replacement of the missing tooth 45 with a prefabricated or extracted tooth

Tooth 45 is missing. The teeth bordering the gap are clinically perfect and are not to be prepared.

- 3.1 Firstly determine the required length of the GrandTEC strip with the help of a piece of WedJet® or a wax wire.

The GrandTEC strip is to run in an arch shape up to the centre of the alveolar ridge and cover the lingual surfaces of the teeth bordering the gap in order to provide the necessary hold.

Prefabricated teeth (dentures) combine poorly chemically with restorative composites. The careful preparation of the denture/tooth will therefore determine the success or failure of your work.

- 3.2 Firstly, select a denture/tooth matched in shape, size and shade as a replacement for the missing second premolar. Grind this tooth so that it fits into the gap. The tooth is to rest basally on the gingiva only with reduced base to enable the patient to clean the tooth subsequently. An undercut must be created in the lingual surface of the replacement tooth to ensure its retention. The undercut must be so dimensioned that it can subsequently completely enclose the GrandTEC strip and the flowable composite.

The lingual surfaces on natural teeth must be mechanically roughened. Removal of tooth substance is, however, not necessary as part of the preparation. In the clinical situation conditioning with phosphoric acid is then carried out and the bonding stage is carried out both on the dental hard tissue and on the replacement tooth. These preparations are not carried out on the model.

- 3.3 Place the replacement tooth prepared as above into the gap and fixate it occlusally to the neighbouring teeth with a small amount of composite on both surfaces and polymerise the composite.

In the clinical situation place interdental wedges or WedJet® pieces in the mouth in the interdental space, in each case mesially and distally of the replacement tooth. This will prevent the composite getting into this area which would later have to be removed in a time-consuming procedure.

- 3.4 With the GrandTEC strip still in its protective foil, shorten it to the length you previously measured with the WedJet® or wax wire.
- 3.5 Apply GrandioSO Heavy Flow thinly in a strip approx. 2 mm wide to the lingual surface of the teeth bordering the gap at the height of the equator, and to the replacement tooth in the area of the preparation. Fill the prepared cavity in the replacement tooth with approx. 2/3 of GrandioSO Heavy Flow.
- 3.6 Remove the shortened GrandTEC fibre from its protective foil and position it in the bed of flowable composite. Take great care to ensure that the GrandTEC strip lies in the prepared cavity of the replacement tooth and adapt it carefully to the lingual surfaces of the teeth bordering the gap.
- 3.7 Polymerise the strip **in sections** initially only briefly (5 seconds) mesially to distally, covering the sections that have not been polymerised with a dental mirror or other suitable instrument.
- 3.8 After this initial fixation cover the GrandTEC strip with a thin layer of GrandioSO Heavy Flow and distribute the composite carefully so that the surface of GrandTEC is completely covered. Only a thin layer need be applied but the surface must be completely covered. The cavity of the replacement tooth must be filled with sufficient flowable composite to ensure that the cavity with the GrandTEC strip embedded within it is filled flush with the lingual surface. A close eye should also be kept on the ends of the GrandTEC strip: these must also be completely embedded in the flowable composite.
- 3.9 Now carefully polymerise the whole of the restoration. i.e. in sections with each section polymerised for 40 seconds.

In the clinical situation you must now remove the proximally placed seals (interdental wedges or WedJets®) and the occlusal fixation of the denture mesially and distally in each case.

Finish the restoration as in the composite filling technique and carefully check the occlusion. Heavy contacts with the replacement tooth both on occlusion and during laterotrusion are to be corrected in turn in every case.

Polishing concludes the fabrication of this restoration.

The following *additional* steps are required for filling gaps with the extracted tooth immediately after an extraction:

- *Before* extracting the tooth prepare a silicone index that at least covers mesially and distally the teeth which will later border the gap. Ensure that the occlusal surface with the proximal contacts to each of the neighbouring teeth remains recessed mesially and distally. You will need this access in order to be able to temporarily fixate the tooth occlusally at a later stage when fabricating the restoration.
- The root of the extracted tooth must be severed and the root canal carefully sealed with composite. Carefully round off the tooth crown at the base and reduce the diameter of the contact surface to the gingiva.
- A groove approx. 2 mm wide must be prepared lingually in the enamel on the extracted tooth for the GrandTEC strip, i.e. the arch-shaped course of the glass fibre strip between the neighbouring teeth is considerably flatter than with a replacement tooth made of plastic. The GrandTEC strip must therefore be *shorter*. If you fail to take this into account when measuring, you may later have to grind so much of the replacement tooth to accommodate the GrandTEC strip that you will have to sacrifice too much dental hard tissue or you might even have to open the pulp cavity lingually in order to create the required space in the tooth for the GrandTEC strip.
- Position the prepared extracted tooth in the gap with the help of the silicone impression and fixate the tooth with composite occlusally, and mesially and distally to each of the neighbouring teeth. Then follow the further procedure set out at Point 3.4.

The fabrication of a silicone impression provides another means of immediate restoration after an extraction, even with a relatively high loss of tooth substance or extensive dental caries.

In this procedure the affected tooth is built up again e.g. with composite *before* extraction without the conditioning of the dental hard tissue that would otherwise be necessary and without the bonding stage. A silicone impression is then made in the area of this tooth and at least one of the neighbouring teeth.

The tooth is then extracted. Using the silicone impression the missing tooth can then be built up easily with composite and quickly on the GrandTEC fibres attached to the teeth bordering the gap.

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