The heart of a good restoration

Impression Materials

Guide to correct material selection
Bad impressions cause depressions

The process of creating a good quality dental restoration that fits and works well, starts with ensuring that you take the most accurate impression possible. If your impression doesn’t capture the precise details of the treatment area, the laboratory will not be able to produce the prosthesis correctly and you will probably find it very difficult, if not impossible to fit. The result is extra work for you, often for which you cannot charge, disagreement perhaps with your laboratory and almost certainly inconvenience for your patient who may also become upset with the ‘poor quality’ of the work. Bad impressions are quite simply, bad for business.

The Impression material

What then are the important features to look for when choosing a dental impression material?

- **Fast setting time:**
  As fast as possible is usually better both for your patients and for your business.

- **Good hydrophilic properties (wettability):**
  Helps to ensure optimum reproduction, even in a wet environment and allows the gypsum to flow into every detail.

- **High tear strength:**
  Reduces the risk of damage to the impression during removal from the mouth.

- **High elasticity:**
  Improves comfort for both patient and technician.

- **Good recovery from deformation:**
  Ensures an exact replica of the treatment area is retained after the impression is removed from the mouth.

- **Dimensional stability:**
  Ensures that the dimensions of the final impression will not be affected during storage and transport.

- **Smell and taste of the material:**
  Can be very important as some materials are highly pungent, which can be very irritating for dental staff and patients.

**Other considerations**

- When carrying out small restorations, it is easier to use fast setting impression materials. However, with larger restorations, normal setting materials are recommended.

- Avoid the use of latex gloves or retraction cords that can affect the setting of the impression material.

- After removing the impression, examine it carefully for any imperfections, voids and air bubbles.

- Disinfect the impression before you send it to the dental laboratory. Your dental technician will appreciate it.

To help ensure that you always take an accurate impression you need to choose the right impression material for the procedure, support the correct functioning of this material with the most appropriate type of impression tray, and of course, employ a good impression taking technique!

The GC Education Guide ‘Impression Trays: Guide to Correct Tray Selection’ highlighted the importance of the tray and gave advice on how to choose the most suitable tray from the myriad of different types available. Selecting the right impression material from the vast range on offer can be equally difficult and so to accompany the GC Guide on Impression Trays, GC has produced this Guide on Impression Materials and their correct selection.
The 'two materials, two steps' technique

Also known as a putty wash or a correction impression, this method uses two different types of material in a two steps procedure. The dentist first makes a pre-impression by inserting the tray with a heavy-bodied putty material into the mouth. After the material sets the dentist removes all undercuts and then cuts escape channels for the excess wash material. This light-bodied correction material is applied in the second step. Some dentists use a plastic foil to create extra space so preventing the need for cutting.

Problems
The two materials, two-steps technique can be a time-consuming and problematic procedure. For example, if the dentist fails to remove sufficient excess material from the pre-impression, it may not fit properly when returned into the mouth causing distortion of the final impression or bite increase. In addition, if the 'spacer' foils are too smooth, the adhesion of the light-bodied injection material to the pre-impression can be affected adversely. However, GC offers dental practitioners a simple solution to this problem.

The GC solution
For this technique GC recommends using the polyethylene Impression Separation Wafer (ISW), a thin, roughened spacer wafer that is applied onto the putty during the pre-impression taking. After the putty has set, the wafer is removed resulting in a very rigid "custom" tray that forms the perfect base for the impression. Ideally this is done before the preparation. Finally the application of a light body material enables precise and detailed reproduction. Since the injection materials are extremely elastic and the wafer leaves sufficient space, easy removal is guaranteed. Also, the rough surface of the wafer ensures that the light-bodied injection materials bond properly to the putty. Impressions with the highest possible precision will be obtained.

Additional recommendations
If you select Exaflex Putty or Exafast Putty for the first impression, GC recommends that you use a perforated impression tray. Alternatively, if you decide to choose Exajet, GC recommends that you use a non-perforated tray with adhesive. GC also recommends that you should use a light-bodied material such as Examix NDS, Exafast NDS or Exaflex Injection, when taking your final impression to ensure that it is as accurate as possible.
Also known as the double impression technique, this procedure is faster than the 'two materials, two steps technique', but it is more difficult to achieve a precise impression. To obtain the best results it is crucial that the viscosity’s of the two materials are as close as possible to each other.

Problems
If a too light bodied wash material is used in combination with a too viscous tray material, such as a putty, it will be pushed away, resulting in a lack of detail reproduction in the cervical area of the impression and possibly distortions over the entire surface. The ideal solution is to use materials with perfectly balanced viscosities and good detail reproduction.

The GC solution
GC provides the ideal solution with Examix NDS Monophase or Exajet, two materials with a viscosity adapted to the lighter-bodied Exa Injection or Regular materials.

Additional recommendations
When using Examix NDS Monophase or Exajet, a non-perforated tray should be selected together with an appropriate adhesive. If the patient’s mouth is completely dry, an injection material is recommended, but if not possible, use the Exa Regular viscosity. The injection type of material should also be used when making an impression for a large span bridge since it has a longer working time.
Also referred to as the monophase technique this method involves applying into the impression tray an impression material that gives sufficient pressure build-up during the impression taking, whilst at the same time the dentist applies the same material by means of a syringe to the treatment area of the patient’s mouth. The base material in the impression tray is then set in the mouth while pressure is applied to ensure that an accurate impression is achieved. This technique requires a material that can provide both a high degree of reproduction and enough pressure build-up.

Problems
The materials most commonly used with this technique are polyethers. Despite producing excellent results, polyethers discharge a pungent odour and have a bitter taste, which can be very unpleasant for the patient. Also, being rather inelastic, these materials can make it difficult to remove the gypsum model after pouring, so increasing the risk of damage to the working model. Experience will tell if the so-called ‘softer versions’ will solve this problem.

The GC solution
GC recommends that an addition-cured silicone material such as Examix NDS or Exafast NDS Monophase be used. If this material is chosen, then it is extremely important that it is used in combination with a non-perforated tray so that sufficient pressure is provided during impression taking.

Ideally, a custom-made tray should be created and always use an adhesive.

The ‘one material, one step’ technique

Lack of detail reproduction
Correct margin?

Use a non-perforated tray for this technique
Non-perforated tray
Universal Adhesive
Examix NDS represents a family of thixotropic and hydrophilic impression materials, supplied in cartridges, which may be used for all popular impression techniques. Being thixotropic, Examix NDS is highly fluid under pressure and remains stable once in position. Excellent hydrophilic properties provide extra wettability and detailed reproduction. Snap-set properties, together with extended working time, make Examix NDS very easy to use. But this is not all; the hydrogen scavenger formulation of Examix NDS eliminates the risk of air bubbles and allows immediate pouring with gypsum.

Advantages
- Cartridge delivery system for homogeneous, bubble-free mixing and no problems from crossover contamination.
- Hydrophilic and thixotropic with uniform flow properties ensure accurate reproduction of detail.
- High degree of elasticity, excellent tear resistance and good dimensional stability ensures that the perfect impression can be made.
- Immediate pouring with gypsum.
- Excellent adhesion to all other GC A-silicone impression materials.

Exafast NDS represents a family of A-silicone impression materials, developed by GC, to provide high-quality, accurate and consistent dental impressions, very rapidly. In fact, Exafast NDS allows you to produce very smooth and highly precise impressions in only around 2 minutes, thus increasing your productivity and maximising the comfort of your patients. Exafast Putty is an extremely fast setting putty material ideally for use in the ISW technique. In combination with the other Exafast NDS materials it’s working time of 45 seconds and setting time of 2 minutes 15 seconds offers you the perfect combination of speed and precision.

Advantages
- The rapid setting time of the impression material reduces the risk of distortion due to movement during setting and is more acceptable to patients.
- Cartridge delivery system for homogeneous, bubble-free mixing and no problems from crossover contamination.
- Hydrophilic and thixotropic with uniform flow properties ensure accurate reproduction of detail.
- High degree of elasticity, excellent tear resistance and good dimensional stability ensures that the perfect impression can be made.
- Immediate pouring with gypsum.

<table>
<thead>
<tr>
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<th>Injection</th>
<th>Regular</th>
<th>Monophase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Materials, Two Steps</td>
<td>As wash material with Exajet Fast, Exafast Putty or Exaflex Putty</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two Materials, One Step</td>
<td>As wash material with Examix NDS Monophase</td>
<td>As wash material with Exajet Normal or Exaflex Putty</td>
<td>In combination with Examix NDS Injection</td>
</tr>
<tr>
<td>One Material, One Step</td>
<td>Examix NDS Monophase</td>
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<td>As wash material with Exafast NDS Monophase</td>
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<tr>
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<td>Exafast NDS Monophase</td>
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</tbody>
</table>
Exaflex represents a family of hand-mixable A-silicone impression materials with exceptional hydrophilic properties ideal for use with all the popular impression techniques.

**Advantages**
- Exaflex is easy to mix and extremely stable. It also has excellent affinity with modeling stone materials making it an ideal partner for dental impressions.
- The high level of elasticity and optimal thixotropic flow properties of Exaflex ensure that dental impressions are made to the highest level of precision.
- The extended working time provided with Exaflex enables you to complete a dental impression without the pressure of time constraints.
- Immediate pouring with gypsum.

Exajet is the world’s first impression material specially designed to work as a complete system with GC impression trays and the Exaflex, Examix NDS and Exafast NDS materials. A heavy body tray material available in a normal and a fast setting version, Exajet also comes in handy self-activating foil pouches that fit all modern dynamic mixing units so leaving no mess.

**Advantages**
- Mixing is simple, bubble-free and produces a consistent texture. If using the normal version, its setting time and consistency is ideal for the ‘two materials, one step’ technique. Alternatively, if using the fast setting version, the setting time is perfect for use in the ‘two materials, two step’ technique especially with an Impression Separation Wafer (ISW).
- A high degree of elasticity enables easy removal of the impression from the mouth and easy removal of the gypsum model from the impression so reducing the risk of breakage.
- Since the foil pouches are activated automatically, there is no need for cutting and no cross-contamination.
- The Exajet cartridge fits all standard-mixing machines.

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**GC Exaflex in combination with other GC products**

<table>
<thead>
<tr>
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<th>Injection</th>
<th>Regular</th>
<th>Putty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two Materials,</td>
<td>As wash material with Exajet Fast, Exafast</td>
<td>In combination with Examix</td>
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<tr>
<td>Two Steps</td>
<td>Putty or Exaflex Putty</td>
<td>NDS or Exafast NDS Injection</td>
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<tr>
<td>Two Materials,</td>
<td>As wash material</td>
<td>In combination with Examix</td>
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<tr>
<td>One Step</td>
<td>with Exajet Normal or Exaflex Putty</td>
<td>NDS or Exafast NDS Injection</td>
<td></td>
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<tr>
<td>One Materials</td>
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<tr>
<td>One Step</td>
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**GC Exajet in combination with other GC products**

<table>
<thead>
<tr>
<th>Technique</th>
<th>Normal Set</th>
<th>Fast Set</th>
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<tbody>
<tr>
<td>Two Materials,</td>
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<td>In combination with</td>
</tr>
<tr>
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<td>NDS or Exafast NDS Injection</td>
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## Impressions Materials from GC

<table>
<thead>
<tr>
<th></th>
<th>Viscosity</th>
<th>Working time</th>
<th>Setting time</th>
<th>Minimum time in the mouth</th>
</tr>
</thead>
<tbody>
<tr>
<td>GC Examix NDS</td>
<td>Injection</td>
<td>2'15&quot;</td>
<td>1'00&quot;</td>
<td>4'00&quot;</td>
</tr>
<tr>
<td></td>
<td>Regular</td>
<td>2'00&quot;</td>
<td>1'15&quot;</td>
<td>4'00&quot;</td>
</tr>
<tr>
<td></td>
<td>Monophase</td>
<td>2'00&quot;</td>
<td>1'20&quot;</td>
<td>4'00&quot;</td>
</tr>
<tr>
<td>GC Exafast NDS</td>
<td>Putty</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Normal</td>
<td>2'00&quot;</td>
<td>4'00&quot;</td>
<td>3'00&quot;</td>
</tr>
<tr>
<td></td>
<td>Fast</td>
<td>1'30&quot;</td>
<td>3'15&quot;</td>
<td>2'30&quot;</td>
</tr>
<tr>
<td>GC Exajet</td>
<td>Injection</td>
<td>2'15&quot;</td>
<td>4'00&quot;</td>
<td>4'00&quot;</td>
</tr>
<tr>
<td></td>
<td>Regular</td>
<td>1'45&quot;</td>
<td>4'00&quot;</td>
<td>4'00&quot;</td>
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<tr>
<td></td>
<td>Putty</td>
<td>1'00&quot;</td>
<td>4'00&quot;</td>
<td>4'00&quot;</td>
</tr>
</tbody>
</table>

All working and setting times measured at 23°C
All other physical properties according to ISO 4823:1993

### Packages

- **GC Examix NDS and GC Exafast NDS**
  - **Intro pack.**
    - foil pouches base 300 ml and catalyst 62 ml
  - **Cartridge**
    - 10 Dynamic mixing tips
  - **Refill**: 2 cartridges, 48 ml each
  - 6 mixing tips II, size S, L or LL depending on the viscosity

- **GC Exajet Normal & Fast**
  - **Intro pack.**
    - foil pouches base 300 ml and catalyst 62 ml
  - **Cartridge**
    - 10 Dynamic mixing tips
  - **Refill**: 2 foil pouches each of base 300 ml and catalyst 62 ml
  - **Clinic Pack.**
    - 6 foil pouches each of base 300 ml and catalyst 62 ml

- **GC Exaflex and GC Exafast Putty**
  - **1-1 Pack.**
    - base and catalyst, 500 g each
  - **5-5 Pack.**
    - 5 x base and catalyst, 500 g each
  - **20-20 Big Pack.**
    - 20 x base and catalyst, 74 ml each

- **Accessories**
  - cartridge
  - 50 dynamic mixing tips

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