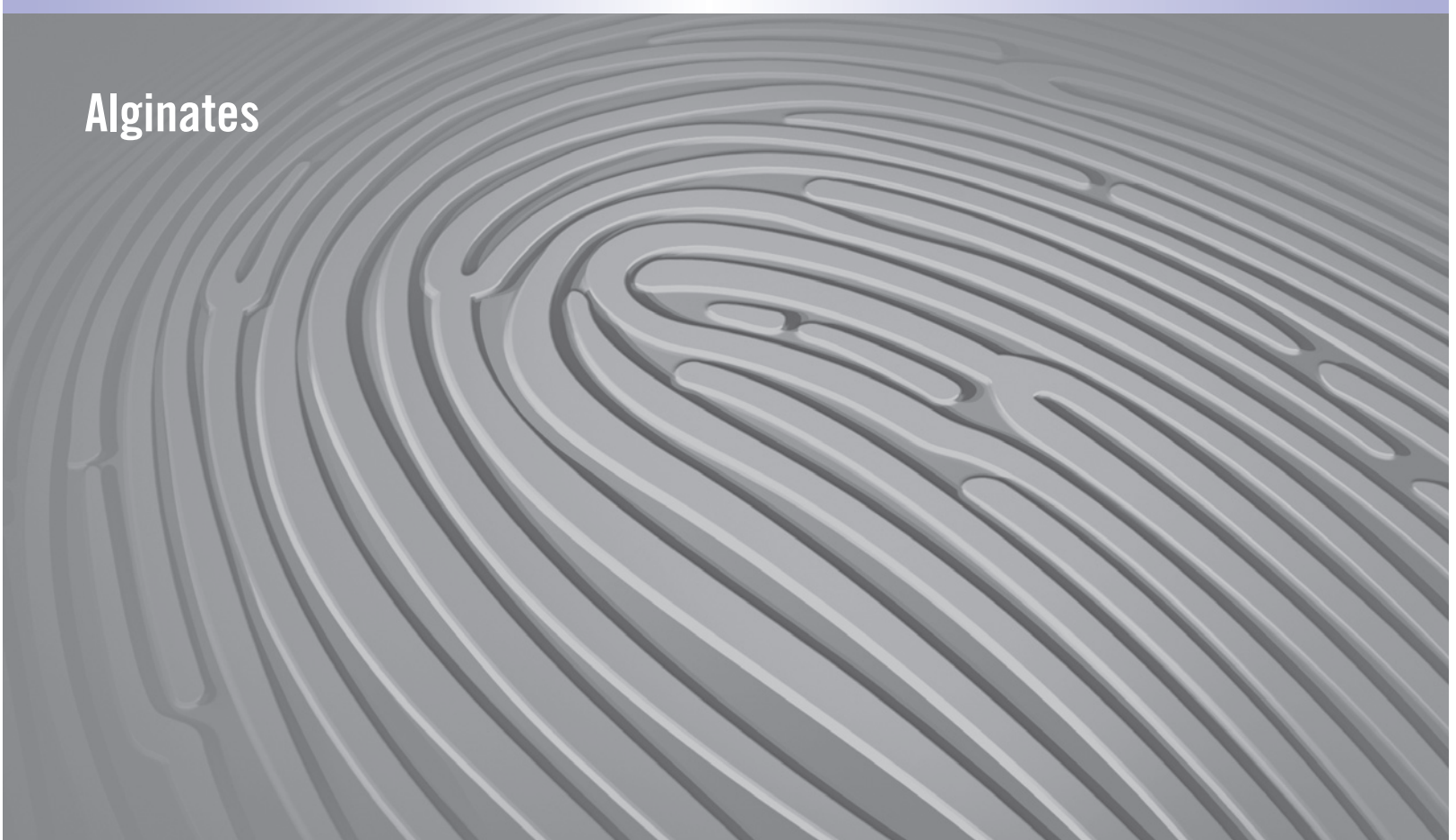


# Alginates



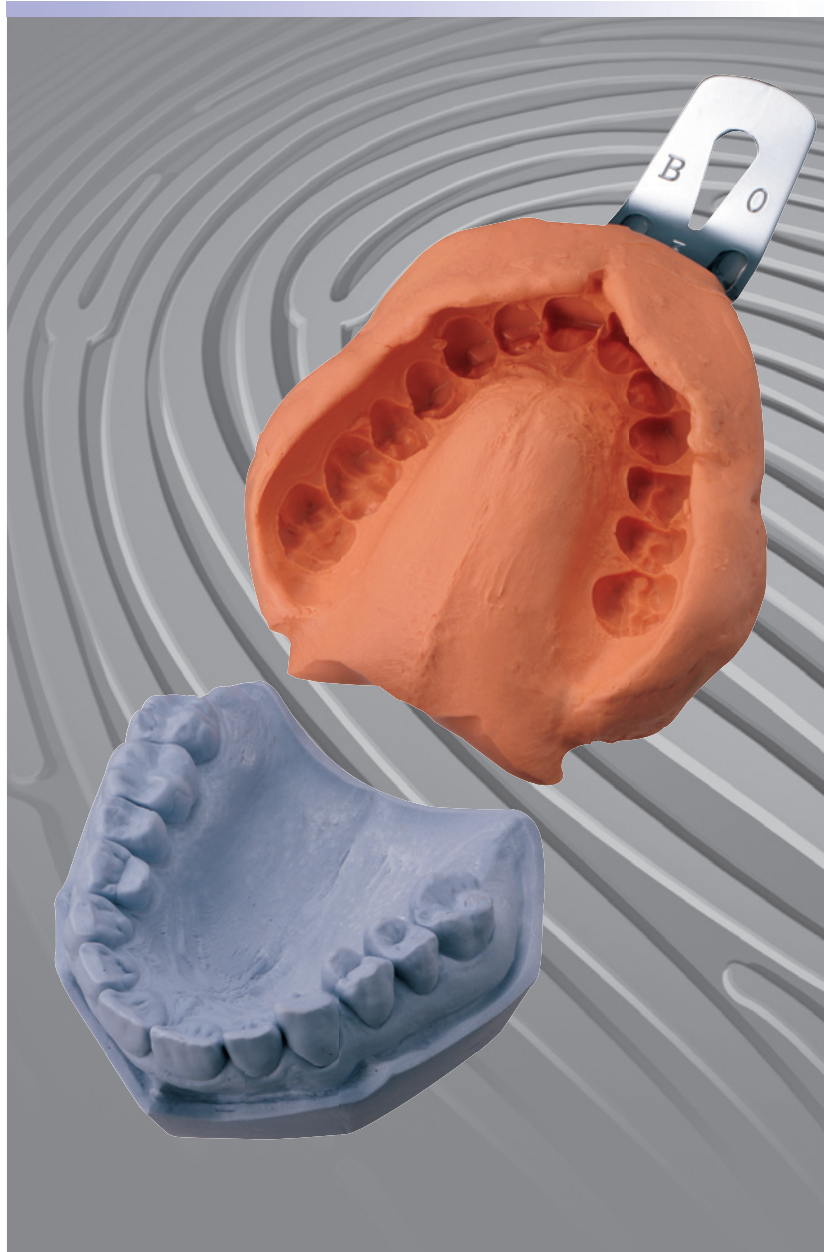
## Guideline for Taking Perfect Situation Impressions



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# 1. Introduction



Anatomical models, which accurately reproduce the shape of the teeth and adjacent jaw sections, are used for many diagnostic and treatment purposes in the dental practice.

A dimensionally accurate impression, i.e. a negative mould of the jaw, is essential for fabricating a precise anatomical model. The most commonly used material for situation impressions is alginate, as it is easy to use, cost-effective compared with other impression materials, and it produces models with an acceptable degree of accuracy.

This depends however on correct storage of the alginate and use of the correct technique. This booklet is intended to provide useful information for this purpose. The procedure for taking alginate impressions and subsequent model fabrication is illustrated clearly and logically.

In addition, the booklet includes information about possible errors when taking impressions and subsequent model fabrication. Causes of error and error prevention are also fully covered.

## 2. Indications for Alginate Situation Impressions

Alginate situation impressions have a wide range of indications including fully dentulous, partially dentulous and edentulous jaws. Anatomical models fabricated from alginate impressions fulfill various functions.

**As a study model** they reproduce the current status of the dentition. They can be used for example to study the ongoing situation during orthodontic treatment or to compare the status of the dentition before and after prosthetic treatment.

**As an analysis model** articulated anatomical models can be used to check the occlusion. Occlusal interferences can be more easily detected on articulated models than intraorally. Any extensive grinding adjustments can initially be simulated on the analysis model.

**As planning models** anatomical models are generally indispensable for extensive prosthetic restorations. Different treatment options can be simulated on the model and allow the dentist, together with the patient, to select the correct treatment for the individual case.

**As an opposing model** the anatomical model reproduces the occlusal contour of the opposing dentition when fabricating restorations, indirect fillings and other treatment appliances that are fabricated on a model.

**As working models** anatomical models poured from an alginate impression are used for fabricating partial cast dentures, simple clasp-retained acrylic dentures and full dentures as well as for fabricating removable orthodontic appliances. Working models can also be used for fabricating custom impression trays, bite blocks and repairs.

# 3. Alginate Materials

## 3.1 Composition

Alginates are included in the irreversible, elastic impression material group. They are extracted from seaweed (lat. alga = seaweed) and are supplied in powder form.

Alginate powder contains sodium or potassium salts of alginic acid, which are easily soluble in water, and calcium sulphate as a second reaction component as well as sodium phosphate retarder. The biggest proportion of powder by mass is made up of inorganic fillers (e.g. talc, zinc oxide, diatomaceous earth), which determine the flow properties of the mixed alginate and increase the strength of the set alginate. Traces of pigments and flavouring agents are also added to the alginate powder as well as fluorides, which improve the surface quality of the stone model.

## 3.2 Setting reaction

In contrast to the salts of alginic acids with monovalent metal ions (e.g.  $\text{Na}^+$  in sodium alginate), which are easily soluble in water, the salts of alginic acids with bivalent metal ions (e.g. calcium ions  $\text{Ca}^{2+}$ ) only have very low solubility, as there is a cross-linking reaction between the polymeric alginic acid molecules.

If water is added to the alginate powder, which contains the easily soluble sodium salts of alginic acid and calcium sulphate as reactants, the two reactants dissociate into their individual components (i.e. sodium alginate dissociates into sodium ions and alginic acids and calcium sulphate dissociates into calcium and sulphate ions).

The alginic acid can now react with the released calcium ions (Fig. 1). An elastic gel forms and the material solidifies due to cross linking of the long-chain alginic acid molecules with one another.

As this reaction is very rapid, retarders are added to the alginate powder to ensure that there is adequate working time.

The retarder, e.g. sodium phosphate ( $\text{Na}_3\text{PO}_4$ ) initially absorbs the majority of the calcium ions ( $\text{Ca}^{2+}$ ) of the calcium sulphate ( $\text{CaSO}_4$ ) released and precipitates them as low-soluble calcium phosphate. The setting reaction of the alginate is only fully initiated when the retarder is completely exhausted. Manufacturers determine the setting time of their product by regulating the amount of retarder added.

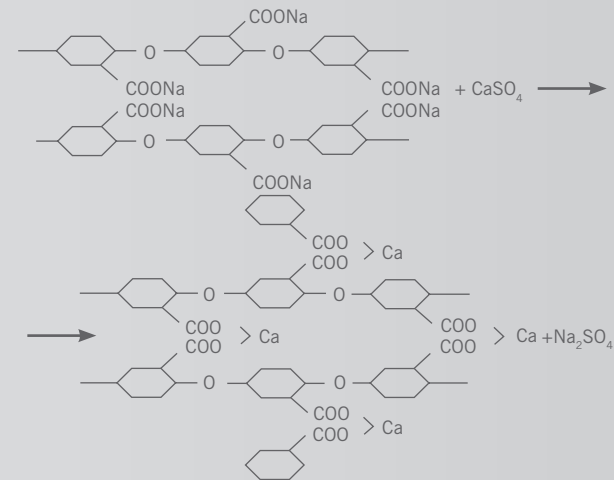


Fig. 1: Setting reaction of the alginate impression material. If bivalent metal ions ( $\text{Ca}^{2+}$ ) are present, there is cross linking of the single-chain, water-soluble alginate molecules when dissolved in water; Ca alginate is produced, which is insoluble in water.

# 3. Alginate Materials

Alginates are classified as fast set and regular set (see Table 1, Page 7). As with all chemical reactions, the setting speed of alginate materials is also greatly affected by temperature. The setting reaction can therefore be retarded by using cold water and accelerated by using warm water.

## Product Overview Alginates

	Xantalgin Crono fast set	Xantalgin select fast set	Alginoplast regular set	Alginoplast fast set
<b>Consistency</b>	creamy	creamy	firm	firm
<b>Working time</b>	1:15 min.	1:00 min.	1:30 min.	1:00 min.
<b>Intraoral setting time</b>	1:00 min.	1:00 min.	1:30 min.	1:00 min.
<b>Setting time</b>	2:15 min.	2:00 min.	3:00 min.	2:00 min.
<b>Mixing ratio (Powder: water)</b>	23 g : 50 ml	21 g : 50 ml	23 g : 50 ml	23 g : 50 ml
<b>Flavour</b>	peppermint	peppermint	peppermint	peppermint

Tab. 1: Different types of alginate

Test complies with ISO 1563 (1990)



Xantalgin Crono



Xantalgin select



Alginoplast regular set



Alginoplast fast set

# 3. Alginate Materials

## 3.3 Material properties

### ▣ Fluidity

The fluidity, i.e. viscosity of the alginate mixture is greatly influenced by the amount of water added for mixing. It is therefore important to adhere strictly to the dispensing ratio of powder and water prescribed by the manufacturer.

### ▣ Reproduction of detail

The accuracy of the detail reproduced in the alginate impression is determined by the grain size of the filler particles and type of polymeric macromolecules. There may, therefore, be minor differences between individual manufacturer's products with respect to accurate reproduction of detail, though this is not clinically relevant. The resolution limit for accurately reproducing fine structures with alginate impressions is approx. 50 µm (according to ISO 1563). As alginate materials reproduce details less accurately than other elastic impression materials, they cannot be used for working models intended for fabricating, e.g. inlays, crowns or bridges.

### ▣ Dimensional characteristics

The water between the macromolecules of the set alginate impression material is loosely bonded. Water can be easily lost or absorbed depending on whether the alginate impression is stored dry or moist. This causes shrinkage or swelling of the alginate and consequently changes in the dimensions.

It is therefore essential that alginate impressions are poured with dental stone as soon as possible.

The latest development in alginate materials is a product that can be kept up to five days without any clinically relevant changes to the dimensions, provided it is stored correctly.

### ▣ Elastic properties

Alginate material is elastic when set due to its cross-linked structure so that it can reproduce undercut areas. Its elastic recovery is, however, lower than that of hydrocolloids. Alginate impressions tear with approx. 50% compression and even with relatively little tensile stress. Areas with severe undercuts such as highly exposed interdental spaces or spaces below self-cleansing bridges should therefore be blocked out with wax intraorally before taking an alginate impression. Care should also be taken to ensure that the layer of alginate between the dentition and tray wall is at least 5 mm thick when taking an impression. Plastic impression trays should not be used, as the elastic deformation of the alginate material is so great when removing the impression that there is insufficient recovery. This results in permanent plastic deformation of the impression.

### ▣ Disinfecting

A particular difficulty when disinfecting alginate impressions is that they can only be immersed in aqueous solutions for a short time without swelling due to their high water uptake, which causes unacceptable dimensional changes.

It is possible to disinfect alginate impressions effectively in a few minutes without impairing their quality by using an aqueous sodium hypochlorite solution.



## 4. Correct Storage of the Alginate Powder

Alginate powder can be stored in the original packaging for up to three years at room temperature (23°C). It is therefore important to check the fabrication and expiry dates on the packaging when purchasing alginate.

Once the packaging has been opened, the alginate powder container must always be properly closed after dispensing material. Adhere to the relevant storage conditions given in the instructions for use.

Always dispense alginate powder from the packaging using a dry instrument.

Never dispense the powder from the container with a moist spatula or remove excess powder from the dispensing scoop with a moist spatula.

The alginate container should be thoroughly shaken at the beginning of each working day.

This loosens the powder that has compacted during storage and ensures it can be dispensed according to the instructions for use.



## 5. Procedure with Alginate Impressions

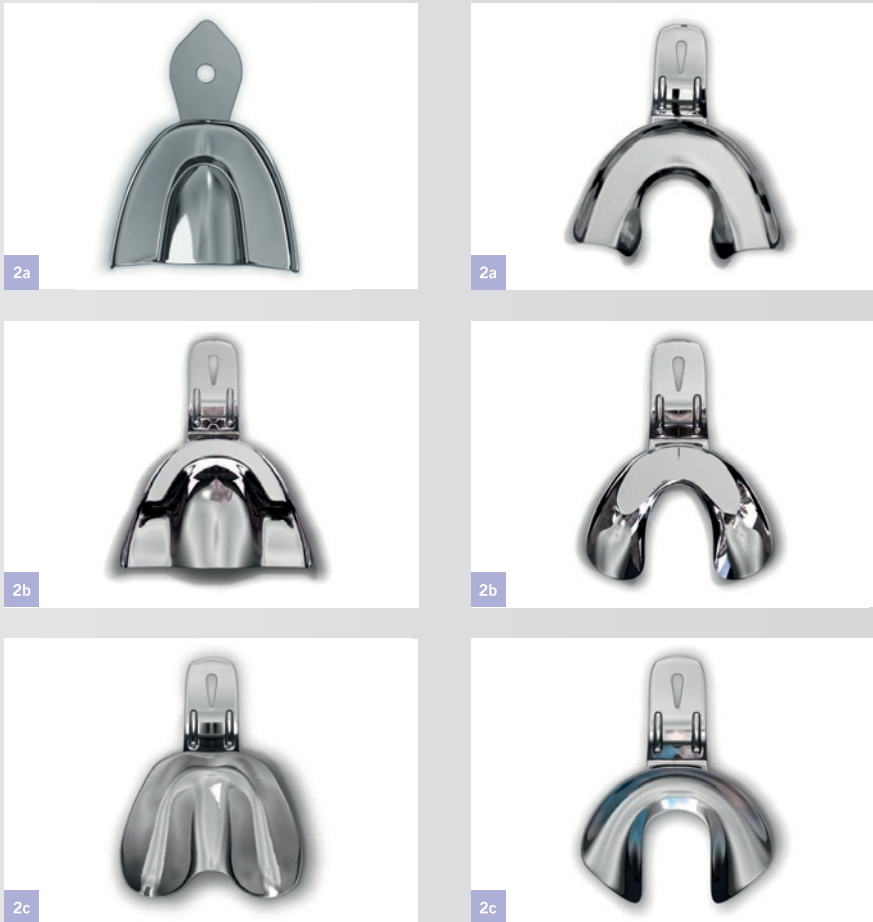


Fig. 2 a–c: Different shapes of impression trays: (a) for fully dentulous jaws, (b) for partially dentulous jaws, (c) for edentulous jaws.

## 5. Procedure with alginate impressions

### 5.1 Selecting the impression tray

An impression tray is required as a holder for the impression material.

**Stock impression trays** are available for fully dentulous, partially dentulous and edentulous jaws. The trays are supplied in different sizes, which are marked on the handle of the tray, and in various designs (Fig. 2 a–c).

Basically trays are made of metal or plastic and are smooth-walled or perforated.

The advantage of **metal trays** is that they can be sterilized.

In contrast, **plastic trays** are normally intended for single use only and also have the disadvantage that they are not rigid enough or torsion resistant.

As alginate does not adhere to the tray walls, the impression tray has to incorporate mechanical retention.

**Rim-Lock trays** with metal beading on the edge of the tray wall are ideal for taking alginate impressions (Fig. 3a).

Simple **smooth-walled metal trays** can also be used with wax strips attached to the edges (Fig. 3b).

Special adhesives are also available for attaining chemical retention between the alginate and metal wall in addition to the mechanical retention.



Fig. 3 a–b: Impression trays with mechanical retention for taking alginate impressions. (a) Rim-Lock tray (b) smooth-walled tray with wax strips attached to the edges

## 5. Procedure with Alginate Impressions

With **perforated impression trays** care should be taken not to pull the impression material out of the perforations when removing the impression from the mouth, as it is difficult to reposition the material (Fig. 4).

Ensure that the tray is large enough when selecting the **size of tray** (Fig. 5).

The alginate layer between the tray wall and the dentition etc. should be at least five millimetres; otherwise there is plastic deformation of the impression when removing the impression material from undercuts.

If the tray is wide enough but not long enough, which is often the case with lower trays, the tray can be extended using Stent mass or gutta percha (Fig. 6).



Fig. 4: Alginate impression pulled out of the perforations cannot be repositioned.

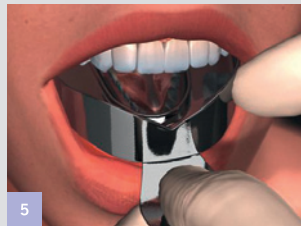


Fig. 5: It is important when fitting the tray that there is sufficient room (minimum 5 mm) for the alginate material between both the tray wall and dentition.

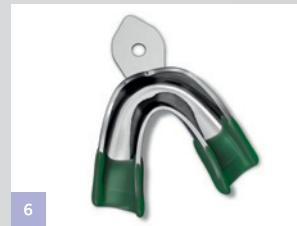


Fig. 6: Lower tray extended dorsally with Stent mass.

## 5. Procedure with Alginate Impressions

### 5.2 Dispensing and mixing

Before the alginate powder is dispensed, the sealed container should first be shaken to loosen the powder (Fig. 7). The alginate powder is then mixed with water in a mixing bowl using a mixing spatula.

**The measuring beaker and spoon supplied by the manufacturer should be used to ensure accurate dispensing of the alginate powder and water. Other dispensing aids lead to incorrect mixing ratios.**

The powder is removed using the measuring spoon and any excess smoothed off with a dry spatula (Fig. 8).

After the required amount of powder has been added to the dry mixing bowl, the correct amount of water is dispensed in the measuring beaker (one graduation per scoop of powder, see Fig. 9).

The working and setting times given by the manufacturer relate to a temperature of 23°C. The full amount of water required is then added. The powder and water should be mixed quickly and thoroughly and spatulated to a uniformly smooth mixture within the prescribed mixing time (see instructions for use). The optimal technique for producing a smooth mix is to press the material against the sides of the mixing bowl when mixing.

To facilitate mixing of the alginate automatic mixers have been developed, in which either the prescribed amount of alginate powder and water can be added or prefilled capsules that already contain powder and water can be used.



Fig. 7: The container with the alginate powder should be shaken each time before dispensing powder to loosen the powder. This ensures that the powder can be dispensed accurately.

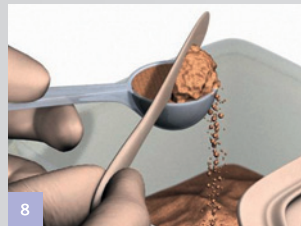


Fig. 8: Smooth off any powder excess with a spatula.



Fig. 9: Measuring the required amount of water in a measuring beaker.

## 5. Procedure with Alginate Impressions

### 5.3 Taking and removing the impression with colour-change alginates

The mixed alginate should be distributed uniformly on the impression tray with a spatula and contoured and smoothed to the shape of intraoral structure using a moistened finger. Spreading a small portion of the impression material into the fissures immediately before placing the tray over the dentition of the upper or lower jaw is recommended to improve the accuracy of the impression (Fig. 10).

When taking lower impressions, the patient's mouth should be kept as fully closed as possible during the few minutes required for the material to set. If the mouth is opened further, the lower arch will become slightly deformed due to muscle movement and produce an impression of a different intraoral situation to that in a centric jaw relationship.

The impression should remain in the patient's mouth until the alginate has completely set (see instructions for use). If the impression is removed too soon, the cross linking reaction is not fully complete resulting in permanent plastic deformation.

The optimal technique when removing the impression from the patient's mouth is to press onto the side of the alginate overflow from the labial vestibule (Fig. 11).

Avoid using the tray handle as a lever, as the alginate is easily loosened from the tray with the leverage.

### 5.4 Special features with colour-change alginates

Use of colour-change alginates provides added assurance. The end of each individual phase is indicated by a change of colour due to the addition of pigments, which react to the changes in pH during the setting reaction. Modern materials can indicate all relevant working stages with a change of colour.

These include the end of the mixing and working time (this is the latest time at which the material can be inserted into the patient's mouth) as well as the final set.

These properties avoid the impression being removed from the patient's mouth before the material is completely set. It can also put sensitive patients at ease knowing that the beginning and end of the intraoral setting time is indicated by a change in colour.

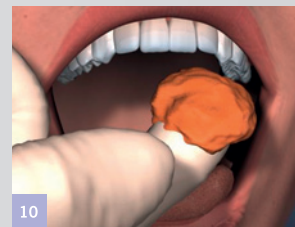


Fig. 10: Before insertion of the loaded impression tray, spread a portion of alginate into the fissures with a finger to improve the accuracy of the impression.

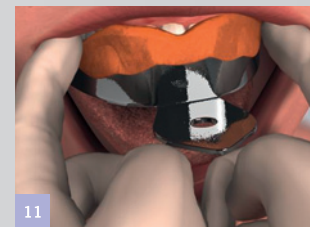


Fig. 11: Loosen the tray with the alginate impression at both sides from the labial vestibule with the fingers and remove gradually to prevent permanent deformation of the alginate material or loosening the impression from the tray.

## 5. Procedure with Alginate Impressions

### 5.5 Assessing and preparing the impression

After it has been removed from the patient's mouth, the alginate impression should be cleaned under running water to remove saliva residue and examined to ascertain if it can be used. The dentition and edentulous jaw sections must be fully reproduced.

Air bubbles in the occlusal surface are reproduced as plaster bubbles on the finished model and prevent accurate articulation of the models (Fig. 12 a-c).

Alginate can be torn in undercut areas when taking impressions of self-cleansing bridges or highly exposed interdental spaces. This results in the impression being unusable. Undercut areas should be blocked out in these cases with viscoplastic silicone or wax before taking the impression (Fig. 13).

If the impression is successful, it should be poured immediately, as alginate shrinks when stored in air due to water evaporation. If the impression is stored in water, it will swell due to water uptake.

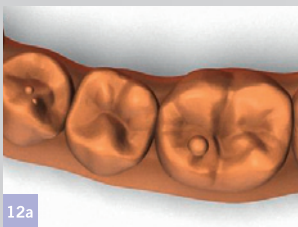


Fig. 12 a: Air bubbles in the alginate impression produces plaster bubbles on the occlusal surface of the stone model.

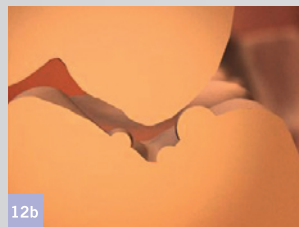


Fig. 12 b-c: The plaster bubbles prevent correct articulation of the upper and lower models (b). There is no interference with intercuspitation after removal of the plaster bubbles (c).

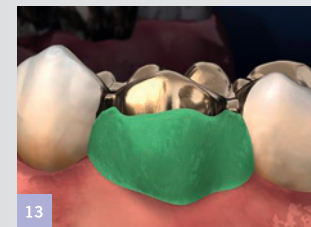
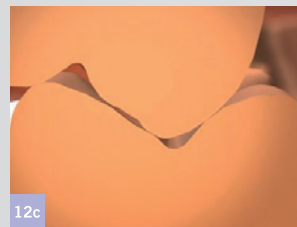


Fig. 13: Blocking out undercuts in self-cleansing bridges

## 5. Procedure with Alginate Impressions

Before an impression is sent to the dental laboratory, it should be trimmed so that there is no excess alginate material protruding over the dorsal edge of the tray (Fig. 14 a).

If this is not possible without impairing the quality of the impression, the impression should be placed with the open area facing downwards otherwise there is the risk of the impression material loosening from the dorsal region of the tray and deformation of the impression (Fig. 14 b).

The alginate impression should first be tapped against the hand to remove excess water and then placed in a sealable plastic bag – without moist tissues or similar aids – for sending it to the dental laboratory (Fig. 15).

As the alginate impression should ideally be poured within 30 minutes to ensure adequate accuracy of the model, it is advisable to complete further processing immediately in the practice. This avoids losing any additional time in sending the impression to dental laboratory. This is not essential with modern types of alginate, which can be stored for up to five days.



Fig. 14 a–c: To prevent loosening of the impression from the tray (a), the alginate impression should be trimmed so that no excess material projects over the dorsal edge of the tray (b) or, if this is not possible, the impression should always be stored with the open area facing downwards (c).

Fig. 15: Place the alginate impression in a plastic bag until it is poured.



# 6. Model Fabrication

Filling the impression of the mouth (negative mould) with a semi-solid material produces a positive mould of the oral situation after the model material sets, i.e. an anatomical model. Dental gypsum is the material of choice for alginate impressions. Other model materials such as cements, resins, ceramic, metal or alloys (metal syringe technique, electroforming model fabrication) cannot be used to fabricate anatomical models from alginate impressions. Gypsum, chemically calcium sulphate dihydrate in crystalline form ( $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ ), adequately fulfils all the requirements of a suitable model material. It is cost-effective and easy to use as a model material.

Dental gypsum is classified into 4 types (I-IV) according to the ADA and DIN standard:

- ▶ Type I – Impression plaster
- ▶ Type II – Model plaster
- ▶ Type III – Dental stone
- ▶ Type IV – High-strength dental stone

Dental stone or high-strength dental stone is used for fabricating anatomical models.

## 6.1 Materials required

- ▶ Alginate impression
- ▶ Dental stone or high-strength dental stone  
(Stone powder must be stored in a sealed container to protect it against moisture)
- ▶ Water
- ▶ Vacuum mixing unit if available, otherwise a mixing bowl
- ▶ Mixing spatula
- ▶ Vibrator
- ▶ Plaster trimmer, if necessary
- ▶ Base former
- ▶ Dowel pins, sticky wax, wax knife, flame

# 6. Model Fabrication

## 6.2 Preparing the impression

We recommend sprinkling the inner surface of the alginate impression with dental stone before pouring it (Fig. 16) and dispersing the stone with a little water. This removes any remaining saliva or blood residue.

The stone powder should be carefully rinsed out and excess water removed after one to two minutes.

The margins of the model can be marked on the alginate impression with an indelible pencil to facilitate fabrication of the base and avoid unnecessary trimming of the model at a later stage (Fig. 17).

With lower impressions the lingual space can also be closed with wax or silicone (Fig. 18).

If there are large spaces between the teeth, dowel pins should be placed in the impression cavity of single-standing teeth as a precaution (Fig. 19).

This prevents the teeth fracturing when the impression is removed from the model.

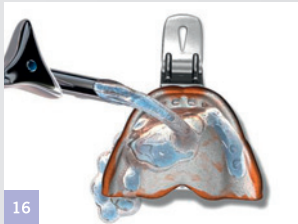


Fig. 16: Sprinkle the inner surface of the alginate impression with dental stone powder to bind any free alginic acids. Dispersing the stone with a little water.



Fig. 17: Marking the model margins with an indelible pencil.

## 6. Model Fabrication

### 6.3 Mixing the dental stone

Dental stone can either be mixed manually in a smooth-walled rubber bowl using a spatula or in a mechanical plaster mixing unit under vacuum.

**All tools used for mixing must be completely clean. Dental stone residue from a previous mixing procedure could reduce the surface quality of the model and accelerate the setting reaction. Adhere strictly to the manufacturer's powder/ water ratio for dispensing.**

The spatulated dental stone mixture should be homogeneous and have a creamy consistency. It is important to avoid trapped air bubbles. We recommend using automatic mixing under vacuum, as it is not always possible to avoid trapped air bubbles completely with manual mixing.

The mixing time with an automatic mixer is approx. 30–45 seconds with a motor speed of 300-400 rpm.



Fig. 18: The tongue space of lower impression closed with silicone and model margin established with a wax strip.

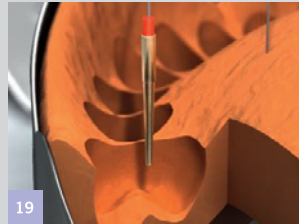


Fig. 19: Dowel pin in the impression cavity of a single-standing tooth to prevent fracture of the stone tooth.

## 6. Model Fabrication

### 6.4 Pouring the impression

When pouring the impression, only a small portion of stone should initially be applied to a smooth surface next to the dental arch using a spatula. The stone is vibrated so that it flows into the deepest areas of the dental arch before adding the next portion (Fig. 20a).

Larger quantities of stone are added gradually and distributed until the impression is filled to the margin (Fig. 20b).

The rest of the stone, which is already slightly firmer, is added to a base former ensuring that there is an excess. The impression filled with stone is then placed onto the base former (Fig. 21a).

Any excess exuding from the side can be carefully removed with a plaster knife. The back of the tray should be supported by a piece of wax, silicone or similar material when the stone is setting to prevent deformation of any impression material projecting from the edge of the tray.

Pouring the model and fabrication of the base can also be completed in two stages. Allow the stone that has been poured to the margins of the impression to set before pressing it into newly mixed base stone using light vibration.

After the initial set of the stone mixture, the base should be trimmed roughly to the correct shape with a plaster knife (Fig. 21b).

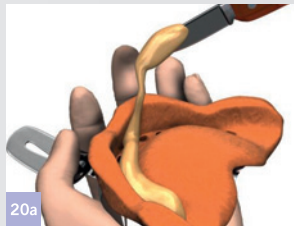


Fig. 20 a, b: Pouring the impression on a vibrator. Only small quantities are initially applied and vibrated into the deepest areas without bubbles (a). Larger quantities are then added until the impression is filled to the margin.

## 6. Model Fabrication

### 6.5 Removing the impression from the model

The alginate impression should be removed immediately from the model as soon as the dental stone has set.

Alginate loses water and consequently its elasticity due to prolonged contact with dental stone or storage over a longer period. Leaving the impression material on the model for a long time, therefore, makes it considerably more difficult to remove it from the model. Water loss causes contraction of the alginate and single-standing stone teeth can be easily broken off the model when removing the impression.

**An alginate impression should therefore never be left on the model overnight.**

The base former and impression tray are removed first when separating the impression from the model.

The buccal margin of the impression is then exposed with a plaster knife. The impression can now be carefully loosened from the model with the fingers.

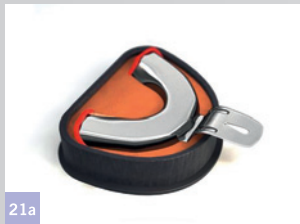


Fig. 21 a: Fabrication of the base. One-stage technique: the poured impression is placed onto the base former filled with stone.



Fig. 21 b, c: Fabrication of the base. Two-stage technique: after the stone in the dental arch has set, turn over the impression and press it into the newly mixed base stone using slight vibration and remove any excess with a plaster knife.



# 6. Model Fabrication

## 6.6 Trimming the model

Once the impression material has been removed from the model, the model can be trimmed to the correct shape using a model trimmer (Fig. 22).

The base should be level and parallel to the occlusal surface. The sides can be angular or rounded. Care should be taken not to remove too much material when trimming the sides.

If the material is to be rigidly mounted in an articulator, it is advisable to roughen the base with a plaster knife (Fig. 23a).

This improves the retention to the plaster. If the model is to be mounted using the split-cast technique, however, parallel notches have to be provided on the smooth model base (Fig. 23b) to ensure accurate repositioning of the model in the articulator.

Use of pins or magnets is recommended with the split-cast technique.

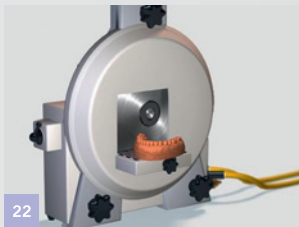


Fig. 22: Trimming the model on the model trimmer.



Fig. 23 a, b: Preparing the base of the model (a) roughened for rigid mounting, (b) notches for mounting the models on the articulator using the split-cast technique.



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## 8. Troubleshooting

Problem	Cause	Remedy
<b>Tearing or loosening of the alginate impression from the tray.</b>	<ul style="list-style-type: none"> <li>■ Inadequate mechanical retention or physico-chemical bond of the alginate to the tray.</li> <li>■ Incorrect storage of the alginate impression.</li> </ul>	<ul style="list-style-type: none"> <li>■ Use Rim-Lock trays or smooth impression trays with wax strips on the edge. Also apply adhesive varnish to the walls of the tray.</li> <li>■ Cut off any sections of the alginate impression that project over the edge of the tray, place the impression with the opening facing downwards.</li> </ul>
<b>Alginate impression tears in the region of the interdental spaces or bridge pontics.</b>	<ul style="list-style-type: none"> <li>■ Undercuts too severe in the region of the interdental spaces or bridge pontics.</li> </ul>	<ul style="list-style-type: none"> <li>■ Block out undercut areas in the impression at the teeth with wax.</li> </ul>
<b>Sections of the impression pressed through to the tray wall.</b>	<ul style="list-style-type: none"> <li>■ Incorrect dispensing: alginate powder was mixed with too much water, resulting in a low viscosity and inadequate resistance when placing the impression material over the dentition</li> <li>■ Excessive pressure applied when taking the Impression.</li> <li>■ No stops provided on the tray.</li> <li>■ Tray too small or inserted at an angle.</li> </ul>	<ul style="list-style-type: none"> <li>■ Adhere strictly to the manufacturer's dispensing instructions.</li> <li>■ Only apply light pressure to the tray with the alginate when positioning it over the dentition.</li> <li>■ Provide the impression tray with stops before taking the impression.</li> <li>■ Try in the tray before taking the impression. There should be a uniform minimum space of 5 mm between the tray wall and dentition.</li> </ul>
<b>Porous stone model surface</b>	<ul style="list-style-type: none"> <li>■ Setting of the dental stone inhibited by free alginic acid on the surface of the alginate impression.</li> <li>■ Water on the occlusal surface of the model, as the impression has been turned over for fabricating the model base immediately after pouring the dental stone.</li> <li>■ Dental stone stored in an open container.</li> <li>■ Stone/ alginate combination is incompatible</li> </ul>	<ul style="list-style-type: none"> <li>■ Before pouring the impression, sprinkle the surface of the impression with stone powder and rinse off carefully after 1–2 minutes under cold running water.</li> <li>■ Do not turn over the impression until the stone has set. A base former can be placed over the impression, which has been filled to excess with stone. Alternatively, a base can be fabricated after the stone in the impression has fully set.</li> <li>■ Dental stone (particularly synthetic stone) has a limited shelf life and is sensitive to humidity. Keep containers closed.</li> <li>■ In rare cases certain stone/alginate combinations are incompatible. It is advisable to use dental stones recommended in the alginate manufacturer's instructions for use.</li> </ul>

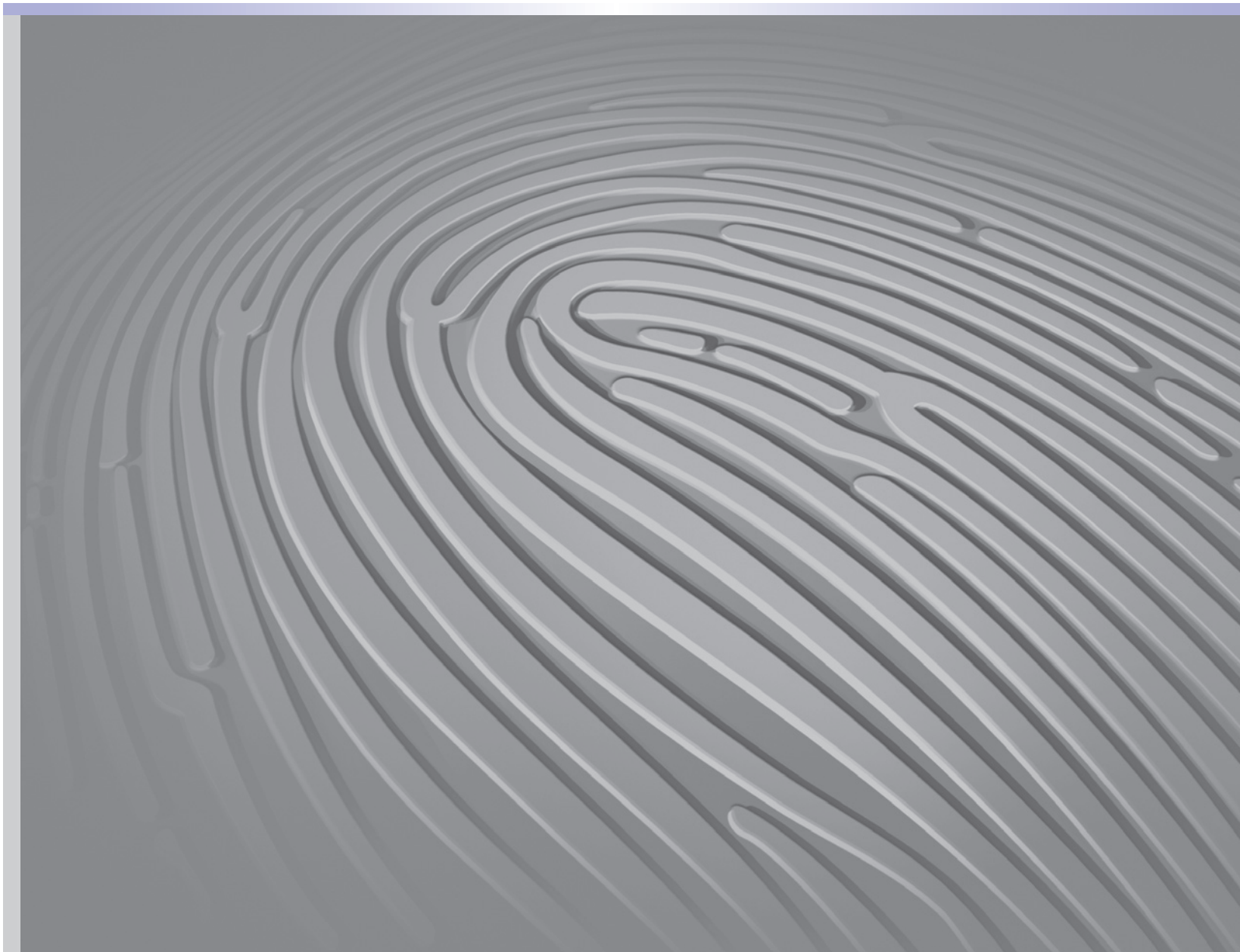


# 8. Troubleshooting

Problem	Cause	Remedy
<b>Inaccurate or incomplete reproduction of the occlusal surfaces in the alginate impression and on the stone model.</b>	<ul style="list-style-type: none"> <li>■ Insufficient flow due to lack of dynamic pressure during impression taking because a perforated impression tray was used.</li> <li>■ Alginate mixed too thinly.</li> <li>■ Working time too long before placing the impression in the patient's mouth. The alginate had already begun to set.</li> </ul>	<ul style="list-style-type: none"> <li>■ Use a smooth impression tray.</li> <li>■ Spread alginate into the fissures with the fingers before taking the impression.</li> <li>■ Adhere to the dispensing instructions.</li> <li>■ Adhere to the working time.</li> </ul>
<b>Plaster bubbles on the occlusal surface of the model teeth.</b>	<ul style="list-style-type: none"> <li>■ Air bubbles in the alginate impression.</li> </ul>	<ul style="list-style-type: none"> <li>■ Spread alginate material onto the occlusal surfaces of the teeth with the fingers before inserting the loaded impression tray</li> </ul>
<b>Fracture of single-standing stone teeth when the impression is removed from the model.</b>	<ul style="list-style-type: none"> <li>■ Alginate impression was left on the model too long and is no longer elastic due to excessive shrinkage.</li> <li>■ Severe undercuts at the teeth or tilting of the impression when removing it from the model.</li> </ul>	<ul style="list-style-type: none"> <li>■ Remove the impression from the model immediately after the stone has set (approx. 30 minutes).</li> <li>■ Loosen both sides of the impression and impression tray when removing the impression from the model. Do not use the tray handle as a lever.</li> <li>■ Place dowel pins in the impression cavity of single-standing teeth before pouring the impression.</li> </ul>
<b>Restorations (acrylic denture, CrCo framework, orthodontic appliance) fabricated on anatomical models, which were poured in alginate impressions, fit on the model but not intraorally.</b>	<p>Permanent deformation of the impression due to:</p> <ul style="list-style-type: none"> <li>■ working time too long before pouring the impression</li> <li>■ impression left too long in the disinfectant solution.</li> <li>■ unnoticed loosening of the alginate impression from the tray wall, e.g. in the dorsal region: material projecting over the edge of the tray was not trimmed and the impression was not placed with the opening facing downwards.</li> <li>■ excessive elastic deformation:                             <ul style="list-style-type: none"> <li>- incorrect technique when removing the the impression from the patient's mouth</li> <li>- inadequate alginate layer thickness because the impression tray selected was too small or a plastic tray was used</li> <li>- excessive pressure applied to the impression during setting of the alginate.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>■ The impression should ideally be poured within 30 minutes, even after it has been stored in a plastic bag, as it could shrink greatly due to loss of water.</li> <li>■ Adhere to the disinfecting time.</li> <li>■ All sections of material projecting over the margins of the tray should be trimmed immediately after removing the impression from the patient's mouth. If this is not possible, the impression must be placed with the opening facing downwards.</li> <li>- The impression should be loosened uniformly and gradually by inserting an index finger into labial vestibule.</li> <li>- Select a tray that is large enough (min. 5 mm space between the tray wall and equator of the dentition). Only use metal impression trays for taking alginate impressions.</li> <li>- After the tray has been placed in the correct position, hold the impression in situ without applying pressure.</li> </ul>

# Notes

A large rectangular area with a light gray background and a thin blue border at the top. It contains 15 horizontal dotted lines for writing notes.



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