

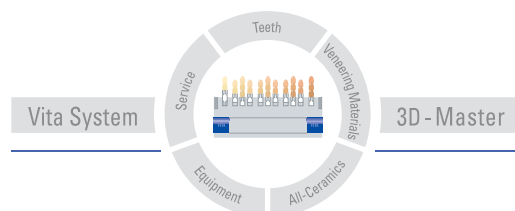
VITA Complete Dentures

Basic theory according to
generally accepted criteria



Working Instructions

Date of issue: 10-06



VITA

<u>Contents</u>	<u>Page</u>
01. Manufacturing complete dentures	3
02. Functional impression tray – Functional impression	4 - 5
03. Bite registration	6 - 7
03.1 Basic theory of the bite registration blocks	8 - 9
1. Model analysis	
2. Manufacture	
03.2 Dentist's sketches on the bite registration block	10
04. Articulators	11
05. Theory of articulation	12 - 13
06. Positioning the model in the articulator	14
07. Model analysis	15 - 16
08. Selection and positioning of the anterior teeth	17 - 18
09. Setting up VITAPAN Anteriores and VITAPAN CUSPIFORM Posteriores	19 - 22
10. Grinding in complete dentures according to the principles of bilateral balance	23 - 25
11. General rules for modelling denture bases and gingiva	26
12. Instructions for processing artificial teeth	27
13. References	28
14. Definitions	29

01.

The manufacture of complete dentures

Overview of the working steps of the dentist and dental technician

Dentist	Dental technician
Anatomical impression	
	Manufacturing the primary models or casts
	Manufacturing the definitive impression trays
Definitive impression	
	Manufacturing the master casts
	Manufacturing the bite plates
Bite registration	
Positioning the master casts in the articulator	Positioning the master casts in the articulator
Selection of tooth mould and shade	Selection of tooth mould and shade
	Setting up the upper and lower anterior and posterior teeth
Wax try-in with aesthetic corrections	
	Modelling and finishing the prostheses
	Re-occluding ¹ and pre-grinding the finished prosthesis
Grinding-in and incorporating ² the complete denture prosthesis	
Final checking	

¹ re-occluding: placing the finished prosthesis once more into the articulator
² incorporating: seating

02.

Functional impression tray – Functional impression

The aim of the functional impression is to maximize the rest area of the denture base taking the muscle movements into consideration.

In order to anchor the complete dentures on the edentulous jaw, a suction effect must be created between the denture base and the mucosal surface. This is achieved by means of the marginal accuracy of the denture base and the resulting cohesive and adhesive forces.³ In order to maintain the suction effect also during the speech and chewing functions, it is necessary to fully model the edges of the denture base, the inner and outer functional margins.

Before taking the impression, the future denture bearing tissue must be in a recovered state, i.e. that previous prosthesis must not have been worn for at least 24 hours. For the functional impression, individual impression trays are used, which are manufactured by the dental technician on the first working models, the anatomical models.

Before manufacturing these, information is required on the impression material with which the functional impression is to be made in order to

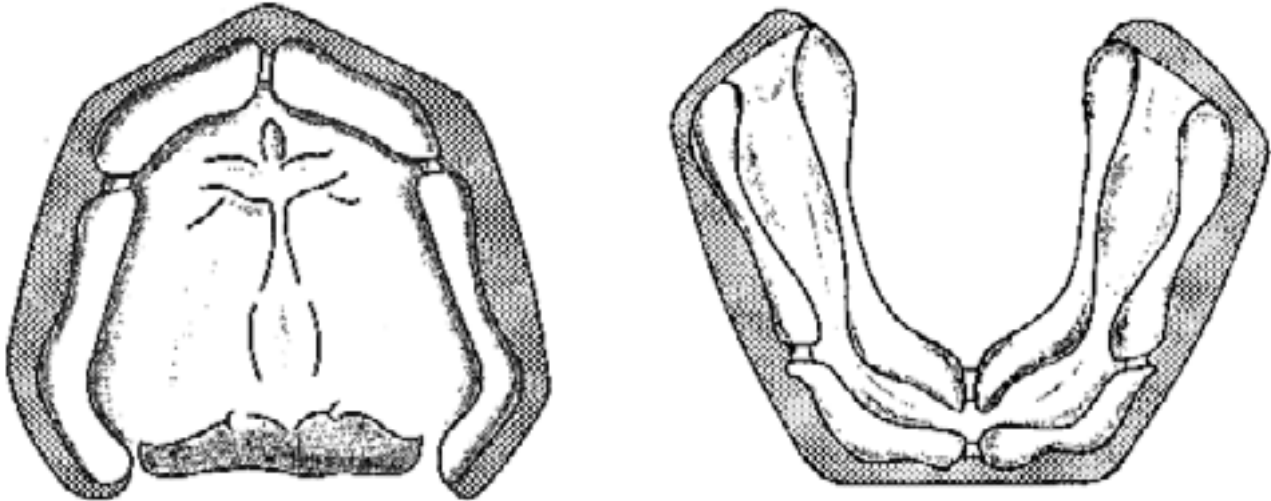
- manufacture accurately fitting impression trays in the case of a material with low viscosity,
- manufacture impression trays with a uniform space between them and the model in the case of a material with high viscosity.

The impression trays should ideally be made of clear acrylic in order to check their accuracy of fit and make corrections if necessary. Furthermore, the impression tray material should be sufficiently hard and torsion-free.

The expansion of the impression trays must be less than the surface of the future denture bearing tissue, and plenty of space should be left around the lip and cheek tendons as well as the tongue tendon.

³cohesion: The internal adherence of the molecules of a body
adhesion: The attachment of the molecules in the area of the border of two different materials

02. Functional impression trays – Functional impression



The functional impression should show:

upper jaw:

- muco-labial fold
- alveolar ridge with the areas of the tuber maxillaris (maxillary cusp) and palate
- transition from the hard to the soft palate (palatal vibrating line)
- lip and cheek tendons

lower jaw:

- alveolar ridge with the areas of the trigonum retramolare (retramolar triangle)
- muco-labial fold and sublingual areas
- muscle and tendon insertions of the tongue and cheek muscles
- lip and cheek tendons

When manufacturing the functional models, care should be taken that the functional margins remain completely intact in order to make a suction effect possible between the denture base and the mucosa by means of functional margins.

A hard plaster of the type IV should be used for manufacturing the master model, and in the case of impressions with pronounced undercuts a somewhat softer hard plaster of the type III should be used.

03.

Bite registration

Correct bite registration is an essential condition for the functional success of a complete denture prosthesis.

This is the means to the 3-dimensional determination of the position relation of the lower to the upper jaw with the aid of centric bite registration or bite plates. The joints should be situated in their cranial⁴ and not in their laterally displaced position in the glenoid fossae.

A distinction is made between:

1. The relation of the lower jaw to the upper jaw

This refers to the definition of the vertical, transversal and sagittal jaw relation.

The vertical jaw relation (occlusal height) is usually 2 – 5 mm shorter than the interocclusal distance of the lower jaw.

The transversal and sagittal jaw relation is determined with the aid of a gothic arch or by bite-taking.

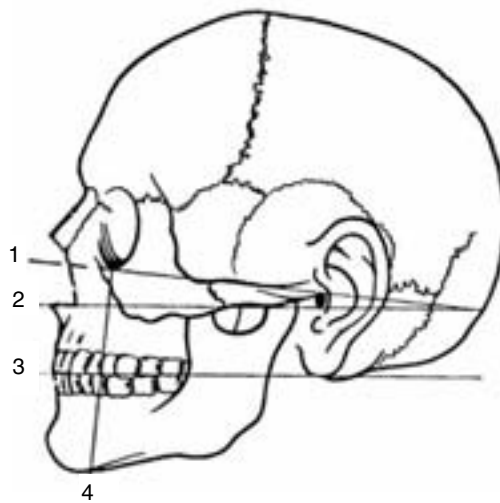
2. Orientation with reference to a cranial plane

To be able to position the models in the articulator with reference to a cranial plane, bite registration is essential.

The cephalic orientation in both models is transferred to the articulator by means of a face-bow.

⁴cranial: with reference to the skull

03. Bite registration



- 1 = Frankfort horizontal plane
- 2 = Camper's plane
- 3 = Occlusal plane
- 4 = Simon's orbitals

Definitions

- 1. Frankfort horizontal plane:** A plane established by the lowest point on the margin of the right or left bony orbit and the highest point in the margin of the left or right auditory meatus.
- 2. Camper's plane:** imagined plane through both tragus points⁵ and the spina nasalis anterior (anterior nasal spine)
This runs parallel to the occlusal plane and forms an angle of 15 – 20 ° with the Frankfort horizontal plane.
- 3. Occlusal plane:** is represented by the following three points on the dentulous jaw:
 - contact point of the incisal edges of the lower central incisors (incisal point),
 - tips of the distobuccal cusps of the second lower molarsThis is mostly situated at the height of the lip closure line.
- 4. Simon's orbitals:** plane through the orbit at a right angle to the Frankfort horizontal plane; is used for determining sagittal variations.
- 5. Median plane:** an imaginary plane passing longitudinally through the body, from front to back, and dividing it into left and right halves.

⁵tragus point: soft tissue on the chondrally stiffened skin flap in front of the auditory canal, which covers this to some extent.

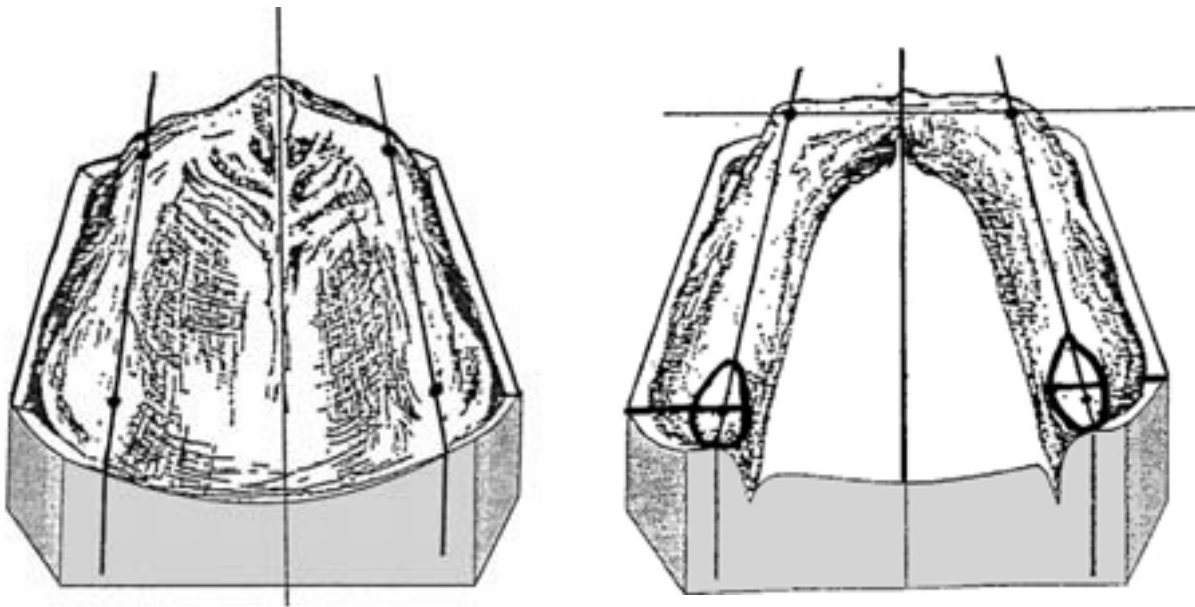
03.1

Basic theory of the bite registration blocks

1. Model analysis

marking

- the centre of the alveolar ridge and transferring to the model margin with the aid of a set square,
- the alveolar process on the model base with the aid of a pair of compasses,
- the retramolar triangle on the mandibular model.



03.1

Basic theory of bite registration blocks

2. Manufacture

1. The baseplates of the record blocks should be made of acrylic.
2. The marginal modelling of the record blocks should take the functional margins into consideration. Tendons and muscle attachments must be exposed.
3. The wax rims should be on the centre of the alveolar ridge.
Exception: in the upper anterior area the wax rim is positioned according to aesthetic⁶ considerations (positioned further forwards to compensate for the age-related recession of the jawbone), and should support the lip according to the anterior tooth set-up.
4. The wax rims should correspond to the future prosthesis with regard to the labial and buccal expansion. The width of the wax rims should be approx. 6 mm in the premolar and approx. 8 mm in the molar area.
5. The height of the upper wax rim should be approx. 20 – 22 mm measured from the deepest point of the muco-labial fold beside the lip tendon to the upper limit of the wax rim.
The distal height is reached by melting the wax rim with the rim former⁷.
6. The height of the lower wax rim should be approx. 18 – 20 mm measured from the deepest point of the muco-labial fold beside the lip tendon to the upper limit of the wax rim.
The distal height should correspond to the upper third of the retramolar triangle.
7. The total height of the record blocks should not be more than 40 mm.

The final moulding of the wax rims is usually carried out by the dentist in the patient's mouth.

⁶aesthetics: The science of beauty and theory of the laws of harmony in nature and art.

⁷rim former: Instrument for melting down the height of the wax rim taking slight sagittal and transversal curves into consideration.

03.2

Dentist's sketches on the bite registration block

Midline

The middle of the face. It must be identical to the upper and lower lip tendons or the centre of the model.

Canine line

This determines the width of the upper anteriors. Here is where the tip of the upper canines should be situated. It can be determined through the mouth angle or by a vertical extension of the outer nasal wing.

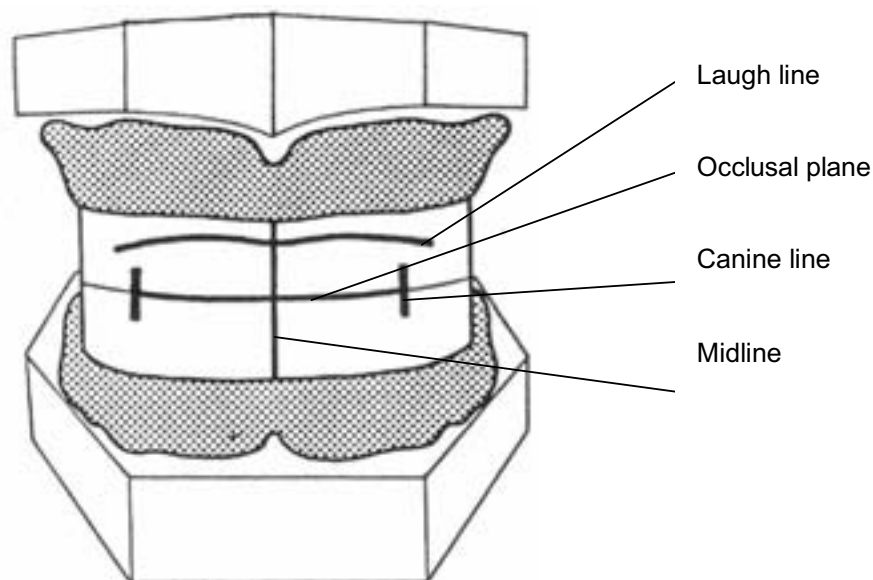
Laugh line

This determines the length of the upper anteriors, the tooth necks should be above this line.

Occlusal plane

This runs from the upper edge of the lower wax rim (= lower incisal edges in the anterior area and the tips of the distobuccal cusps of the second lower molars) and intersects the midline, which is the fixing point for the incisal pin.

This runs parallel to Camper's plane.



With regard to their labial and buccal expansion, the occlusion rims should correspond to the future prostheses. The aesthetics should be optimized during bite registration by applying wax or by reducing.

04. Articulators

In order to produce complete dentures, it is necessary to have a device which simulates the opening and closing movements as well as the lateral and protrusion movements made by the patient. A device which carries out such movements is described as an articulator.

Classification of articulators according to their construction:

Arcon⁸ articulators

An arcon articulator is a mechanical device which imitates the natural temporomandibular joint. The condylar casings are situated on the upper part of the articulator, the condyles⁸ are attached firmly to the lower part of the articulator.

The advantage of this type of articulator is the unidirectional movement as with natural chewing apparatus.
e.g. : Denar, MarkII, New Simplex, Panadent, Protar, Quick-Perfekt, SAM, Stuart.

Non-Arcon⁸ articulators

In contrast to the arcon articulator, the condylar casings are situated on the lower part of the articulator and the condyles on the upper part. All movement sequences are made in the opposite direction to the natural temporomandibular joint.

e.g. : Atomik, Atraumatik, Condylator, Dentatus, Mastikator, Rational.

Classification of articulators according to the type of movement that can be made:

Average value articulators

These correspond to Bonwill's triangle* and the inclination of the condyle path is taken to be a fixed value. Masticatory movements can therefore only be carried out on an average-value basis.

average value inclination of condyle path: 34°

average value Bennett angle: 15°

Semiadjustable articulators

These allow different values to be set, such as the inclination of the condyle path*, the Bennett angle, as well as in some articulators the intercondylar distance.

Fully adjustable articulators

These articulators reproduce individual values obtained using an extraoral or intraoral registration procedure.

⁸ARCON: a contraction of ARticulatio (joint) and CONDylus (condyle)

* See list of definitions

05.

Theory of articulation

The aim of articulation theory is to interpret the existing anatomical conditions of edentulous jaws with the physical and mechanical conditions of the dynamic chewing system in such a way that feasible solutions for the practical manufacture of complete dentures can be developed.

Literature on the subject offers various examples with explanation models as well as practical working instructions.

On the basis of a comparison of the different opinions on the subject, the individual measures can be compiled to form a basic theory of articulation for the functional prosthesis as follows:

- mandibular movements must always be simulated, ideally individually,
- this requires articulators,
- slightly abraded, anatomical tooth moulds are essential for function,
- for static reasons, the teeth must be situated on the centre of the alveolar ridge,
- the upper anteriors are situated in front of the alveolar ridge,
- Overbite = overjet,
- in order to ensure positional stability, compensation curves* are imitated in order to maintain a three-point contact during mandibular movements,
- the greatest chewing unit, the first lower molar, must be in the area of the deepest point of the alveolar ridge – in the chewing centre,
- The reproduction of the denture bearing tissue must be accurate.

*see list of definitions

05. Theory of articulation

Definitions:

Bennett angle:

The Bennett angle (between 10° and 20°) is the angle formed between the sagittal plane and the average path of the advancing condyle as viewed in the horizontal plane during lateral mandibular movements

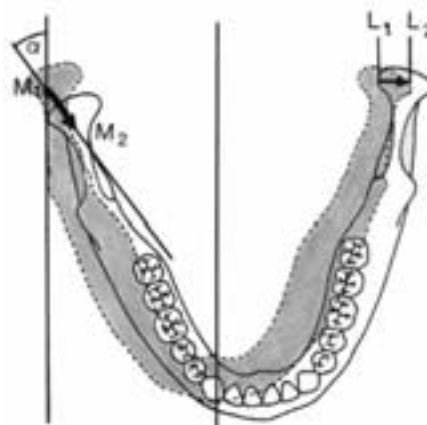
Bennett's movement

The lateral and 3-dimensional shifting of the laterotrusion condyle during a lateral movement. The condyle can move

sideways and upwards	(laterotrusion)
sideways and downwards	(laterodetrusion)
sideways and forwards	(lateroprotrusion) as well as
sideways and backwards	(lateroretrusion)

The size of the movement has an influence on the Bennett angle.

α = Bennett's angle
formed by the straight connection
line through the beginning
and end point of the mediotrusion
path M_1 to M_2
and a parallel line to the
median plane (= paramedian
plane) through the starting
point of the movement



L_1L_2 = Bennett's movement
= lateral and 3-dimensional
shift of the laterotrusion
condyle during the lateral
movement

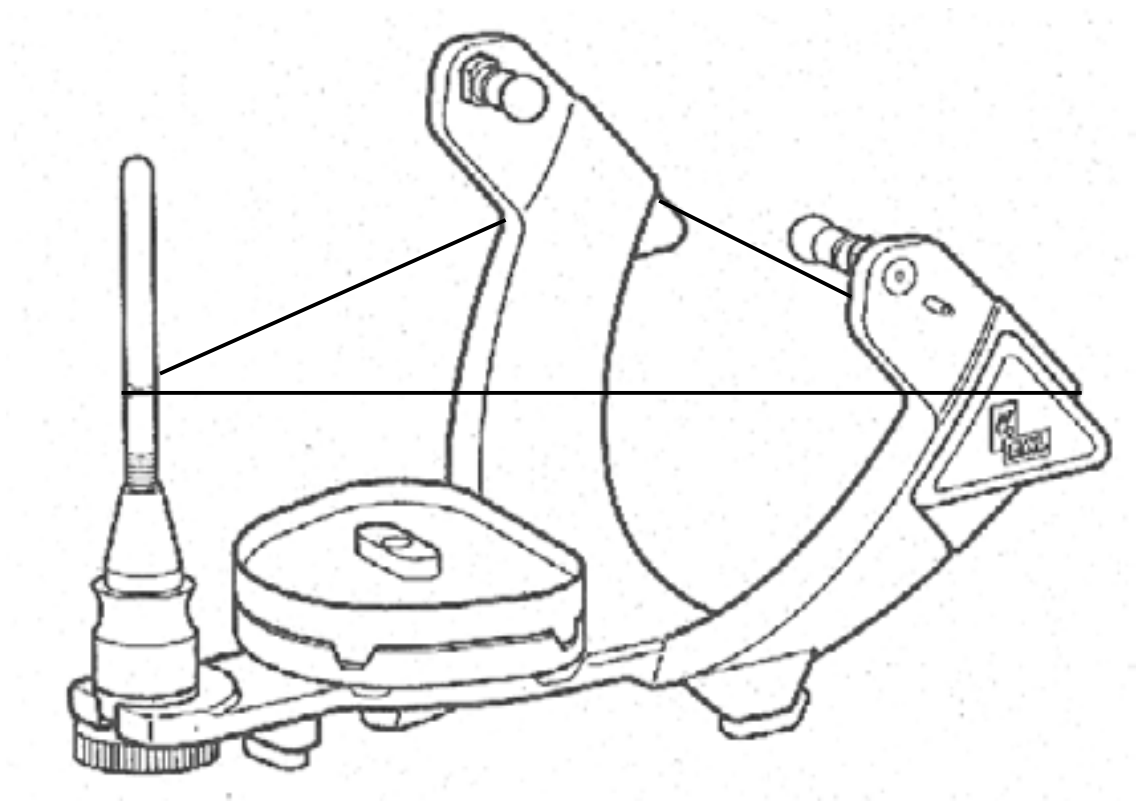
Bonwill triangle:

An equilateral triangle (length of 1 side approx. 10.5 cm) that runs from the mandibular incisal point to the middle of the right and left condyles.

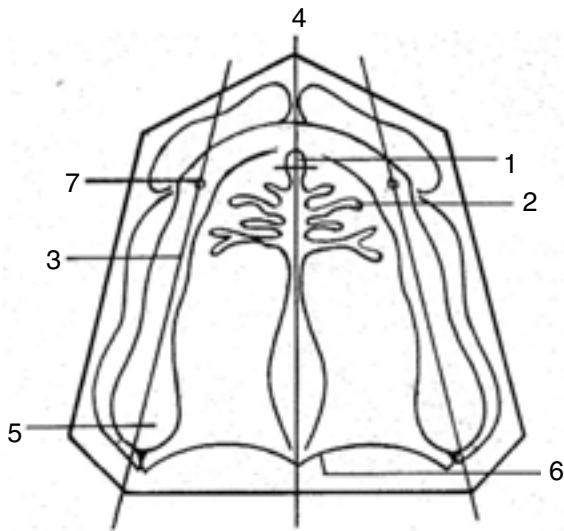
06. Positioning the models in the articulator

Preparation: Guide grooves are made on the underside of the maxillary and mandibular models using a plaster grinder, so that they can be remounted after the prostheses are completed.

These are aligned to the occlusal plane.

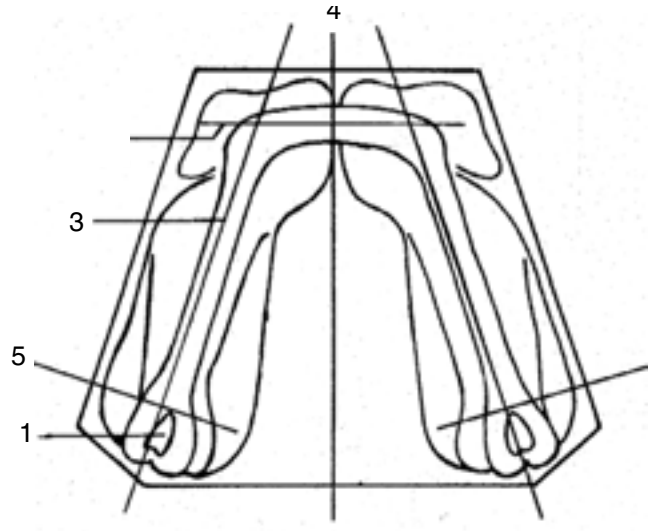


07. Model analysis



Upper jaw

- 1: incisal papilla
(papilla incisiva)
- 2: large palatal ridge
- 3: centre of alveolar ridge
- 4: midline of model
- 5: maxillary cusp
(tuber maxillaris)
- 6: palatal vibrating line
- 7: canine point



UK:

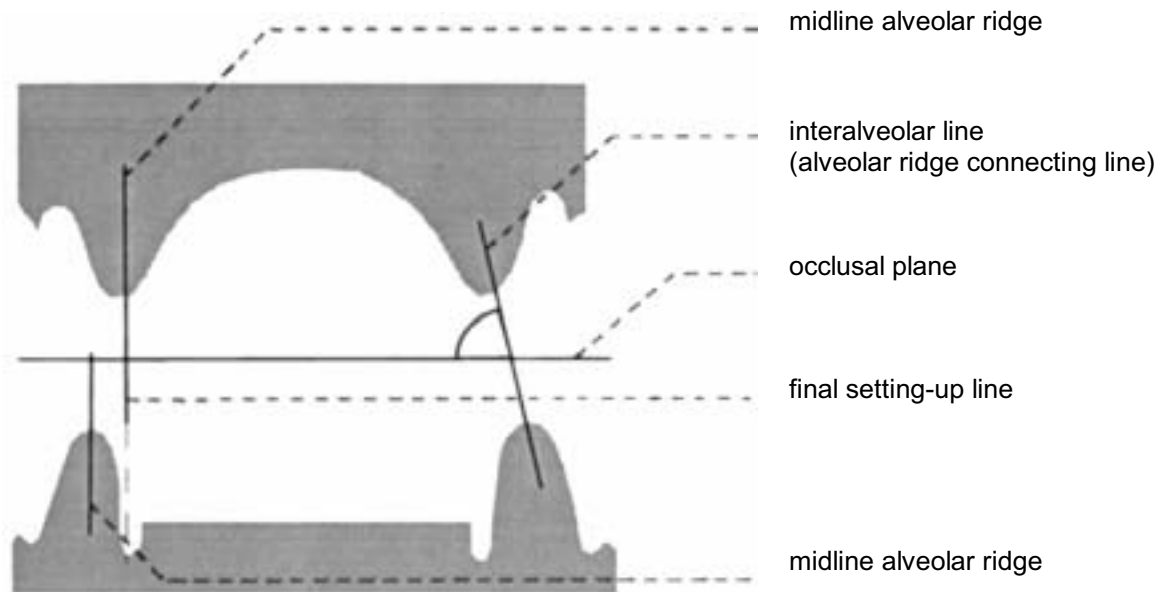
- 1: retramolar triangle
(trigonum retromolare)
 - 2: centre of alveolar ridge, front
 - 3: centre of alveolar ridge, lateral
 - 4: midline of model
 - 5: border line for the distal sides of the last molars
- The deepest point in the posterior area is also marked on the model base.

If the height of the occlusal plane is not given, this can be calculated as an average value by measuring the distance of the deepest point of the muco-labial fold in the upper and lower jaw, and halving this value.

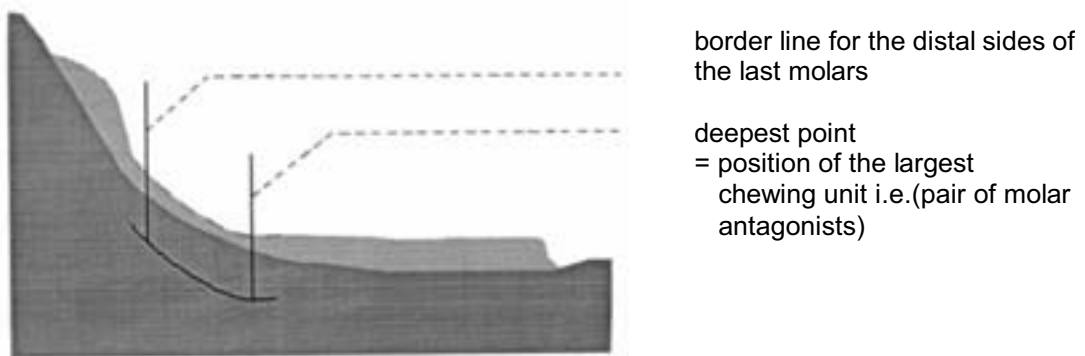
The final set-up line is determined by determining the alveolar ridge lines and transferring these to the outer margin of the model at the front and back. These form the outer limit of the static field.

Furthermore, the following values which the dentist indicated on the bite plate are transferred onto the models: midline, canine line.

07. Model analysis



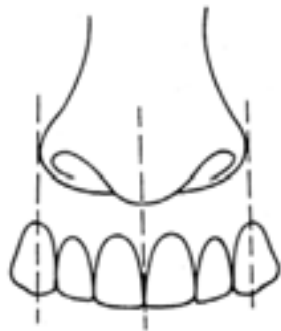
If the inclination of the interalveolar line to the horizontal plane (α) is over 80° , a neutral bite should be set up, if it is under 80° a cross bite should be set up. (Gysi)



Behind the border line for the distal sides of the last molars begins the steeply rising mandibular ramus, on which no more teeth should be set up, since otherwise the prosthesis could slip forward due to incorrect stresses. Constant sliding forward of the mandibular prosthesis would cause senile mandibular protrusion. In the case of flat alveolar ridges the set-up of the teeth ends on the mesial edge of the retramolar triangle.

08. Selection and positioning of the anterior teeth

Determination of the width of anterior teeth according to *Lee*



- The axis of the canine touches the outer edges of the nasal wing.
- Width of central incisor \triangleq width of lateral incisor + mesial facet of the canine.

Determination of anterior tooth shape according to *Williams*



tooth shape strictly
according to facial
shape

Anterior tooth positioning according to *Gerber*



Positioning of the teeth
according to the shape
of the nose

Tooth shapes according to *Gysi*



tooth shape and
positioning according to
facial harmony

08. Selection and positioning of the anterior teeth

Tooth shapes according to *Kretschmer*



Pyknic type

oval
tooth shape



Leptosomic type

triangular
tooth shape



Athletic type

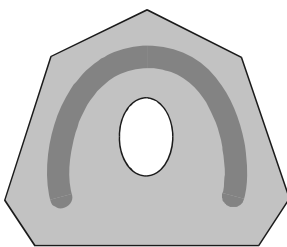
angular, almost
square
tooth shape

The shape of the incisors is reflected in the types of constitution⁹.

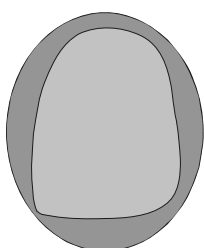
Other possibilities

Should the dentist have no information on the appearance of the patient and the shape of the teeth, it is also possible to take the maxillary alveolar ridge as a basis for determining the tooth shape

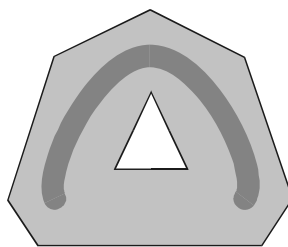
oval alveolar ridge



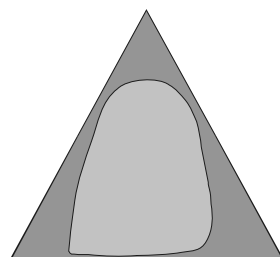
oval anterior tooth shape



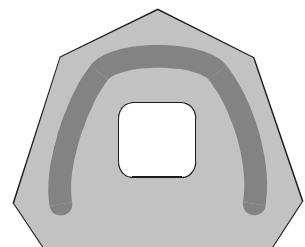
pointed alveolar ridge



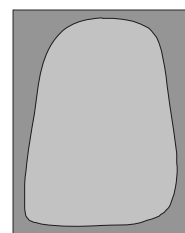
triangular anterior tooth shape



square alveolar ridge



square anterior tooth shape



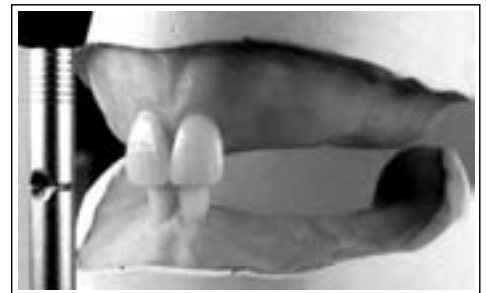
⁹constitution type: basic type of human physique (physical type).

09. Setting up VITAPAN Anteriores and VITAPAN CUSPIFORM Posteriores

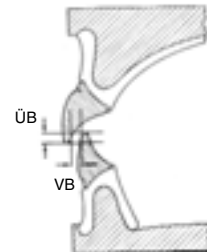
VITAPAN Anteriores

The dentist has formed the bite rim according to aesthetic and phonetic¹⁰ principles. The set-up of the anterior teeth is according to the mould of the bite rim as well as to aesthetic and phonetic principles, and in the lower jaw according to static¹¹ requirements.

- Set-up of both lower central incisors with the body of the tooth corresponding to the centre of the alveolar ridge taking the incisal pin into consideration. With the labial surface straight, inclined in the vestibular direction, the incisal edge pointing in the direction of the upper muco-labial fold; seen from a labial view, the teeth are completely straight and upright.
- The upper central incisors are positioned opposite to these, whereby a sagittal step of 1-2 mm is assumed.



The overbite should exactly correspond to the overjet so that balancing can be achieved with lower jaw movements.



- All upper and lower anteriors are now set up step by step:



¹⁰phonetics: Theory of tone, articulation and speech formation; is influenced by tooth positioning, denture base and tongue.

¹¹statics: Theory of equilibrium of forces on bodies at rest.

09.
Setting up
VITAPAN Anteriores and VITAPAN CUSPIFORM Posteriores

The natural appearance of the **upper jaw anterior tooth positioning**

is achieved by the following axial positioning seen from the labial point of view:

central incisors horizontal,
lateral incisors inclined cervically in a lateral direction,
canines more horizontal, with the cervix more towards
the vestibular side.

Central incisors and canines are parallel to the pupil line¹²,
but in the arch corresponding to the positive laugh line.



The distance between the connecting line of the two canine tips, which crosses through the centre of the incisal papilla, and the labial surface of the two central incisors is approx. 7-8 mm. The distance of the tip of the second large palatine ridge and the labial surface of the canine is approx. 9-11 mm.



The labial surfaces of the upper anteriors support the upper and lower lip.



The incisal edges of the **lower anteriors** all touch the occlusal plane to the same extent, whereby the canines are max. ½ mm higher.

Seen from the labial point of view

the central incisors are straight and vertical,
the lateral incisors are inclined slightly in the mesial
direction,

The canines are mesially inclined, the distal facet is
pointing in the direction of the molars.

Approximal inclinations:

All anteriors are positioned with the body of the tooth on the
centre of the alveolar ridge,

central incisor is inclined towards the vestibular side,
lateral incisor is upright
canine is lingually inclined.



- Checking the set-up by means of lateral and protrusion movements.

¹²pupil line:

An imaginary anterior line that passes through the centre of the pupils

09.
Setting up
VITAPAN Anteriores and VITAPAN CUSPIFORM Posteriores

VITAPAN CUSPIFORM Posteriores

During every single stage of setting up, occlusion, laterotrusion and protrusion (i.e. all excursive movements) should be checked with the aid of occlusion foil

The following applies to the set-up of all **lower posteriors**:

- They are positioned on the centre of the alveolar ridge,
- the central fissures are situated on a straight line which runs between the tip of the canine and the centre of the retramolar triangle,
- the buccal cusps are situated on the tangent of the Bonwill circle, which reaches from the buccal limit of the first premolar to the buccal limit of the retramolar triangle,
- the lingual cusp tips are situated on Pound's line
- they are lingually inclined (=> crown alignment, increasing towards the distal side).

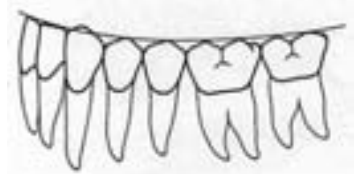
The following applies to the set-up of the **upper posteriors**

- They are positioned on the centre of the alveolar ridge,
 - the central fissures are situated on an elliptical connection line between the tips of the canines and the tubera maxillare,
 - seen from the front view, less and less buccal surface can be seen from the first premolar to the second molar, which gives rise to the buccal corridor,
 - they are buccally inclined.
- The two first premolars should be set up in the lower jaw, the buccal cusp tips should touch the occlusal plane.
 - The first lower molar must be set up in the area of the deepest point of the alveolar ridge (chewing centre), taking into account the sagittal and transversal compensation curves. The buccal cusp tips are approx. 2 mm below the occlusal plane, rising towards the distal side.
 - The second lower premolars are adapted to the space between the 1st premolar and the 1st molar, they are situated approx. 1 – 1.5 mm below the occlusal surface.



Sagittal compensation curve (curve of Spee)

runs through the cusp tips of the lower posteriors on both sides from the 1st premolar to the 2nd molar.



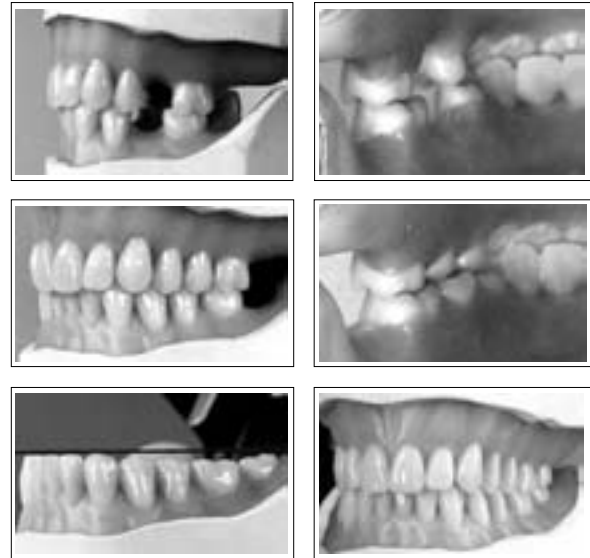
Transversal compensation curve (curve of Wilson)

runs from the buccal cusps of the lower posterior teeth to the right over the more deeply positioned lingual cusps to the left over the lingual cusps to the buccal cusps.



09. Setting up VITAPAN Anteriores and VITAPAN CUSPIFORM Posteriores

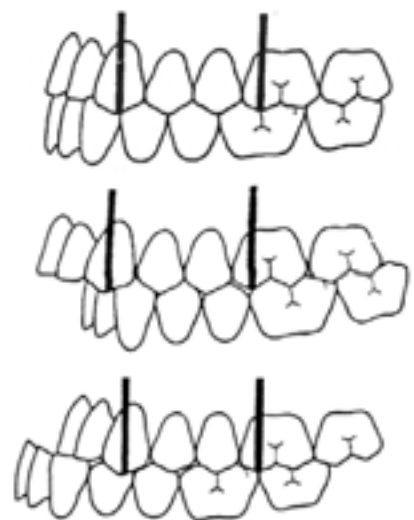
- The first upper molar is brought into optimal intercuspation.
Attention! Small corrections of position can optimize the occlusion.
- The second upper premolars are fitted into the appropriate space.
- Should space be sufficient, the four second molars are now brought into position.
In the lower jaw the distobuccal cusps of the last molars touch the occlusal plane.
In the case of very limited space, premolars can also be set up.



Posterior teeth with pronounced cusps are able to balance out Christensen's phenomenon¹³ by reproduction of the sagittal and transversal compensation curves, which ensure support of the teeth and hence also the occlusal balance.

Posteriors in a tooth-to-two-tooth relationship

Angle's class I	= normal occlusion (neutroocclusion)
Angle's class II (here: Angle's class II,1 also: Angle's class II,2)	= distocclusion = narrow maxillary arch = normal or square-shaped maxillary arch)
Angle's class III	= mesiocclusion



¹³Christensen's phenomenon: The space that occurs between opposing occlusal surfaces during mandibular protrusion

10.

Grinding in complete dentures according to the principles of bilateral balance

Condition:

- correct set-up of the teeth and interlocking of the cusps and fissures,
- heeding the sagittal and transversal compensation curves,
- sagittal step (overbite = overjet) generally 1 – 2 mm.

Basic rules:

- the palatal cusps of the upper teeth 4, 5, 6, and perhaps 7 and the buccal cusps of the lower teeth 4, 5, 6 and possibly 7 secure the occlusion.
These must be conserved after determining the occlusion .
- When grinding in the anterior teeth, cosmetic aspects should be taken into consideration.

Grinding in the occlusion

The palatal cusps of the upper posterior teeth 4, 5, 6, and possibly 7 should have homogeneous contact in the fossae of the lower posteriors.

Also the lower posteriors 4, 5, 6 and possibly 7 should have good contact with the antagonist.

The supporting cusps must not be shortened, the fossa of the antagonist must be ground.

Grinding in the movement

Principle: The supporting cusps of the posteriors 4, 5 and 6 secure the occlusion, they must not be altered any more in the following grinding procedures, they must be conserved.

- On the **laterotrusion side** (working side) there should be homogeneous contacts in the anterior area as well as between the buccal cusps of the posteriors:
For cosmetic reasons, grinding on the laterotrusion side in the anterior area should only take place in the lower jaw.
In the posterior area corrections are only made on non-supporting elements.
The occlusion contacts must be marked beforehand, since these must be conserved.
- On the **mediotrusion side** (balance side) there should be antagonist contact between the upper palatal cusp and the lower buccal cusp on at least two posterior teeth.

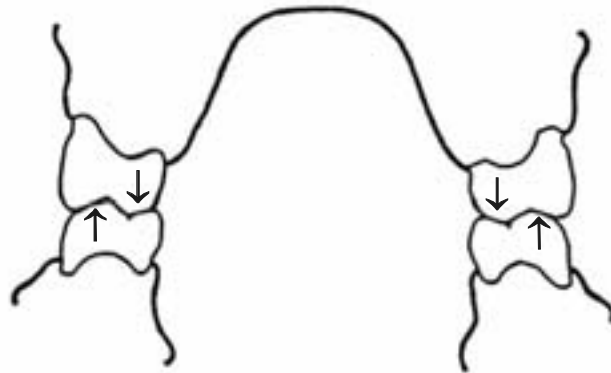
Grinding in the protrusion

Bennett angle in 0° position

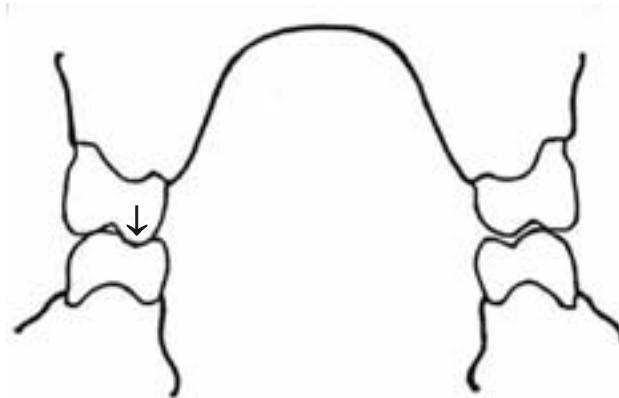
In the case of protrusion positioning (incisal edges of the upper and lower anteriors overlap), there should be a support on both sides in the dorsal posterior area.

10.
Grinding in complete dentures
according to the principles of bilateral balance

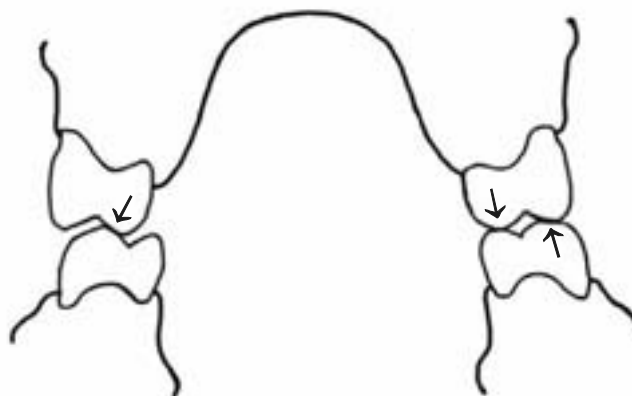
When grinding in, the supporting cusps should never be ground.
The arrows are on the above mentioned supporting cusps.



In this case the fossa of the antagonist must be ground.

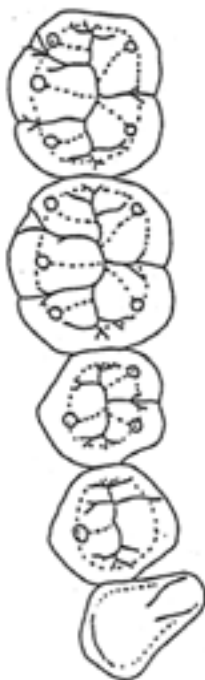
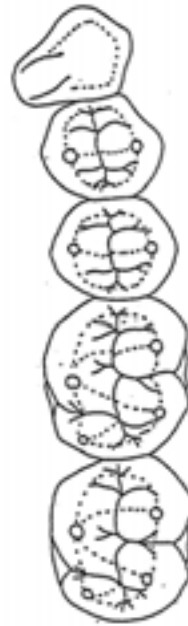
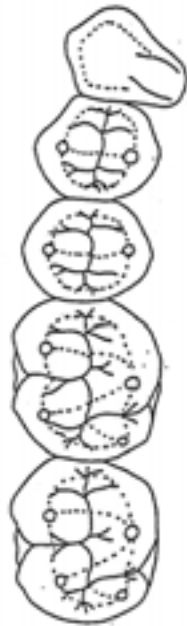


Here the posteriors are optimally balanced.



10.
Grinding in complete dentures
according to the principles of bilateral balance

Example of occlusion



11.

General rules for modelling denture bases and gingiva

The moulding of the denture base must be adapted to the degree of care given by the patient. Only in the case of good oral hygiene can the prosthesis be anatomically designed, particularly in the anterior area. Otherwise the surfaces of the prosthesis must be smooth and without structure and hence easy to clean.

- Wax that is homogeneously warm, but not too hot, is applied to a sufficient degree around the teeth which have been set up.
- The functional margins must be completely filled, the expansion of the denture basis must be at a maximum.
- In order to facilitate torsion-free lifting off of the prostheses after modelling, the model edges must be exposed up to the transition to the muco-labial fold.
- To enable the outer surface to grip the muscles, the prosthesis has a concave¹² design in the anterior and posterior area. In the anterior area, the anterior part of the denture base is inserted in the upper and lower jaw, on the vestibular side marginal ridges are formed.
- The functional margin is omitted in the areas of the muscle attachments and tendons, as fitting to the function.
- The palatal surface is smooth, if necessary, palatine ridges are formed in the anterior third which ideally correspond to the patient's own.
- The lingual surface is designed in a slightly concave¹² manner without endangering the stability of the prosthesis.
- In order to expose the teeth, take the contours of the anterior and posterior teeth in the cervical area as a basis and cut each tooth free.
Either the modelling of the papilla covers the necks of the teeth up to the enamel margin (middle age), or the tooth necks are exposed (old age).
- In the upper anterior area the labial frenum is formed.
- With a hard brush or a toothbrush, the area of the firm mucosa can be stippled to give a surface structure.
- The modelling should be generally smooth and round. The wax can be easily smoothed with a spirit burner (e.g. Alkohol-Torch) without damaging the acrylic teeth. If a Bunsen burner is used, the acrylic teeth may be destroyed through coming into contact with the flame.
- The wax is removed from the surfaces of the teeth.

¹²concave: curving inwards.

12. Instructions for processing artificial teeth

In order to guarantee the bonding of the VITA acrylic teeth to the base material, the following procedure is used:

1. The teeth should be roughened with the repairing cutter 108.
Retention holes are to be avoided, as these destroy the structure of the acrylic and so weaken the tooth within itself. Retention holes will possibly only be half-filled with base material, as the air has no opportunity to escape.
2. The teeth must be completely free from insulation and wax residue.
3. The use of VITACOLL is to be recommended in the case of heat-curing materials, and is absolutely essential in the case of autopolymerizing materials.
In the case of all abrasion-resistant teeth of the new generation, this bonding agent is necessary to slightly dissolve the acrylic of the tooth in order to produce a chemical bond between the tooth and the base material.
VITACOLL is applied with a brush or an instrument and must be left to take effect for 5 minutes. Should the teeth no longer have a wet glaze after this time, it must be applied again.
No VITACOLL must be poured into the flask.
After being left to take effect for 5 minutes, the base material must be transferred to the flask within 10 minutes, otherwise the effect is cancelled out.
4. In order to avoid the formation of a marginal gap in the transition zone between tooth and base material, the areas of the teeth which will be embedded in the base material must be first be roughened with a tungsten carbide bur.

The use of VITAFOL H is recommended when denture processing.

This two-component silicone is applied to the teeth; cusp tips and incisal edges of the teeth should be omitted so that they remain fixed in the plaster.

This saves the teeth from being broken during deflasking.

The gingival margin does not come into contact with the plaster, which saves a great deal of time when deflasking and finishing.

Any contact of the teeth with the insulation (wax against plaster) is avoided, as this would prevent the VITAPAN teeth bonding with the base material.

13. References

Hohmann, A. / Hielscher, W.
Lehrbuch der Zahntechnik Band 1
Quintessenz Verlags-GmbH 1989

Hohmann, A. / Hielscher, W.
Lehrbuch der Zahntechnik Band 2
Quintessenz Verlags-GmbH 1989

Drücke, W. / Klemm, B.
Schwerpunkte in der Totalprothetik
Quintessenz Verlags-GmbH 1986

Schulz, H.H.
Verlag Neuer Merkur GmbH 1989

Lehmann, K.M.
Einführung in die Zahnersatzkunde
Urban & Schwarzenberg 1982

Gründler, H. / Stüttgen, U.
Die Totalprothese
Verlag Neuer Merkur GmbH 1995

14. Definitions

Frankfort horizontal plane (1):

A plane established by the lowest point on the margin of the right or left bony orbit and the highest point in the margin of the left or right auditory meatus.

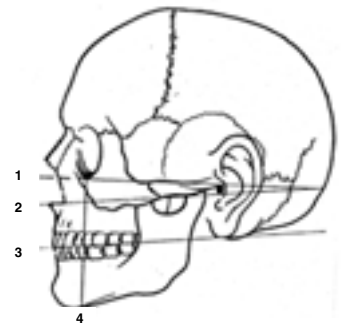
Camper's plane (2):

Imagined plane through both tragus points and the spina nasalis anterior (anterior nasal spine). This runs parallel to the occlusal plane and forms an angle of 15 – 20° with the Frankfort horizontal plane.

Occlusal plane (3):

Is represented by the following three points on the dentulous jaw:

- Contact point of the incisal edges of the lower central incisors (incisal point),
- Tips of the distobuccal cusps of the second lower molars
- This is mostly situated at the height of the lip closure line.



Simon's orbitals (4):

Plane through the orbit at a right angle to the Frankfort horizontal plane; is used for determining sagittal variations.

Median plane:

An imaginary plane passing longitudinally through the body, dividing it into left and right halves.

Condyle path inclination angle:

Is the angle between the protrusion path of the condyle and Camper's plane. (average value 34°)

Laterotrusion movement:

Movement of the mandible to the maxilla to the right or left side, in a lateral direction.

Protrusion movement:

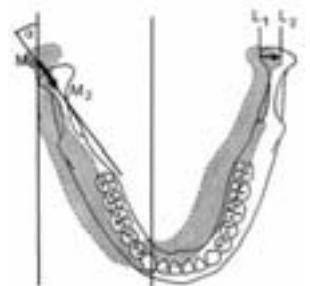
Forward movement of the mandible, in which both condyles move ventrally (downwards) simultaneously.

Bennett's movement:

The lateral and 3-dimensional shifting of the laterotrusion condyle during lateral movement. The size of the movement has an influence on the Bennett angle.

Bennett angle:

The Bennett angle (between 10° and 20°) is the angle formed between the sagittal plane and the average path of the advancing condyle as viewed in the horizontal plane during lateral mandibular movements



14. Definitions

Bonwill triangle:

An equilateral triangle (length of 1 side approx. 10.5 cm) that runs from the mandibular incisal point to the middle of the right and left condyles.

Bonwill circle

The incisal edges of the lower anteriors and the vestibular cusp tips of the first lower premolars lie on a rounded arch, the Bonwill circle.

Pound's line

This touches the lingual limit of the retramolar triangle and runs along the lingual cusps of the posteriors to the mesial edge of the canine.

Sagittal compensation curve (curve of Spee):

Runs through the cusp tips of the lower posteriors on both sides from the first premolar to the second molar.

Transversal compensation curve (curve of Wilson):

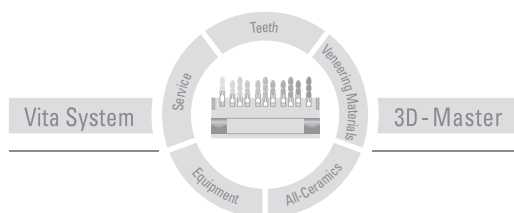
Runs from the buccal cusps of the lower posterior teeth to the right over the more deeply positioned lingual cusps to the left over the lingual cusps to the buccal cusps.

Christensen's phenomenon

The space that occurs between opposing occlusal surfaces during mandibular protrusion



With the unique VITA SYSTEM 3D-MASTER
all natural tooth shades are systematically determined
and completely reproduced.



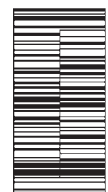
Please note: Our products should be used according to the working instructions. We cannot be held liable for damages resulting from incorrect handling or usage. The user is furthermore obliged to check the product before use with regard to its suitability for the intended area of applications. We cannot accept any liability if the product is used in conjunction with porcelains and equipment from other manufacturers which are not compatible or not authorized for use with our product. Furthermore, our liability for the correctness of this information is independent of the legal ground and, in as far as legally permissible, is limited to the invoiced value of the goods supplied excluding turnover tax. In particular, as far as legally permissible, we do not assume any liability for profit loss, for indirect damages, for consequential damages or for claims of third parties against the purchaser. Claims for damages based on fault liability (culpa in contrahendo, breach of contract, unlawful acts, etc.) can only be made in the case of intent or gross negligence. The VITA Modulbox is not necessarily a component of the product. Date of issue of these working instructions: 10-06

VITA Zahnfabrik has been certified according to the Medical Device Directive and the following product bears the CE mark **CE 0124**:

VITA Complete Dentures

VITA

VITA Zahnfabrik H. Rauter GmbH & Co. KG
Postfach 1338 · D-79704 Bad Säckingen · Germany
Tel. +49/7761/562-222 · Fax +49/7761/562-446
www.vita-zahnfabrik.com · info@vita-zahnfabrik.com



1062E - 1006 (5) SI