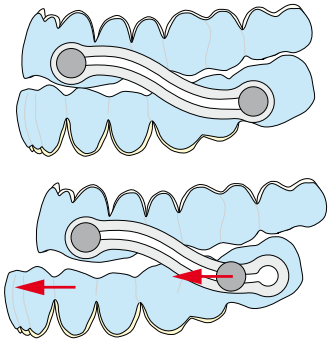
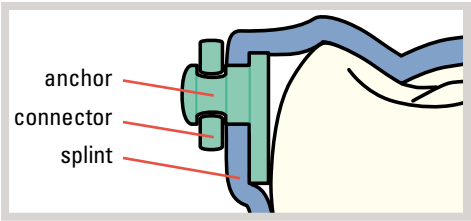
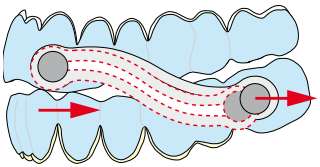
Instructions: Silensor-sl

Mandibular advancement splint



In case of sudden propulsion movements during sleep the anchor can slide into the connector. This avoids compressing and overloading the connectors.





The light flexing of the double-S shaped connectors improves the wearing comfort and reduces load in the connecting area of all parts.

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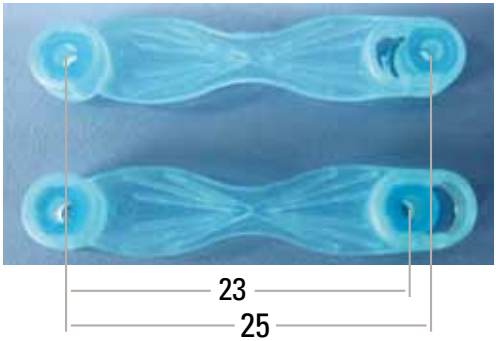
Important hints:

- The **most far-reaching consequences** of all lower jaw protrusion splints, thus also of the Silensor-sl, is **tooth migration**. It is therefore mandatory to integrate all existing teeth in the splints. It is recommended to keep a **duplicate of the initial situation** to counteract, if necessary, a possible tooth migration with a simple correction splint.

- If a construction bite with the sl-protrusion-gauge is available, the models will be articulated with the help of this, otherwise in the final bite position.

- The Silensor-sl can be fabricated in normal bite position or as in most cases with protruded lower jaw. The results of the questionnaire (Silensor-sl flyer) will help in finding a solution.

- The measuring template can be used with 23 or 25 mm length. The length of 25 mm should be preferred as in this case longer connectors with a better wearing comfort can be used.
  Only in case of very small jaws the drilling shell is put in the 23 mm entry and measured with this one.



- If a construction bite with the sl-protrusion-gauge is available, it is measured with 25 mm and the 25 mm long connectors are used.
  Without construction bite it is measured in the normal bite position with 25 mm and the 24 mm long connectors are used.
  (If 23 mm are used for measuring, the measurements are reduced by 2 mm each.)

- The ready-made Silensor-sl shall offer balance contact points. If this is not possible by grinding, it should be adjusted by addition with Resilit-S (817 501) (817 503).

- The connectors are easily exchangeable, for example if more protrusion is required for a sufficient effect.

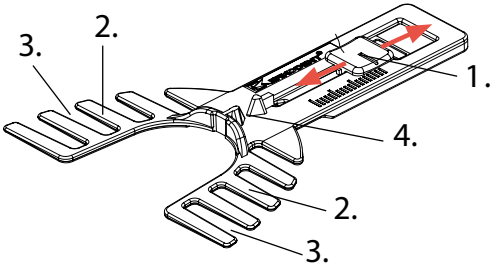
sl-protrusion-gauge

offers in a simple way the possibility to register on the patient the lower jaw protrusion for the Silensor-sl.

Recommendation for mandibular advancement splints:
The advancement of the lower jaw shall correspond to the half of the maximum protrusion achievable by the patient. Or an already known effective advancement will be adjusted.

The features of the sl-protrusion-gauge:

1. protrusion sled
2. elastic registration areas
3. conical registration retentions
4. frontal teeth bite area for upper and lower jaw



protrusion sled

1. Insert the sl-protrusion-gauge. Watch the centre of the frontal teeth.

2. Mark the habital bite situation. Push the lower jaw forward to the maximum without lateral deviations.

3. Mark the maximum protrusion. Remove the gauge.

4. Mark the desired protrusion and adjust the gauge to it.

5. Insert the gauge and register.

Gauge with removed registration.

Fabrication:

Materials for fabrication:

- Silensor-sl Set (59 60 11, foil Ø 120 mm, EN) or single components.
- Erkodur, 2.0 mm, hard, (necessary for the fabrication of the lower jaw splint in case of poor retention).
- Erkoloc-pro, 3.0 mm, soft/hard, 2-layered, high wearing comfort, can always be used for the upper jaw and for the lower jaw only in case of enough retention.
- If available, construction bite with the sl-protrusion-gauge.

For model preparation: Erkogum violet (110 847) for blocking out, high-fusing wax (725 055 lilac) for filling bubbles in the plaster, Erkoskin (625 050) to relieve the gingival margin.

For finishing: Finishing set Quick 2 (110 877) Contents: fissure bur for rough cutting out, HSS-twist drill to cut out the desired form, crosscut tungsten carbide bur for fine grinding, Lisko-S and Liskoid for prepolishing. Polishing Set (110 878) to polish hard thermoforming materials.

Model preparation

In case of a very retentive teeth situation, the marking of the prosthetic equator is recommended (1.). With the exception of the fixation points, the splint ends in case of large undercuts on the equator, otherwise 1 - 2 mm below.

In case of using Erkodur (hard), relieve tension from the four upper front teeth by applying Erkoskin (2.).

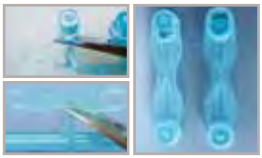
Block out undercuts and spaces with Erkogum, block out bubbles in the plaster with high-fusing wax. Relieve tension from the gingival margin in the area where the splint possibly has contact (3.).

If the measuring point is located on an edentulous area, this must be filled with plaster (4.). In case of a free-end situation, a plaster wall is put on the ridge (5.).

If a construction bite (following abbreviated cb) with the sl-protrusion-gauge is available, the measuring length (25 or 23 mm) and the connector length are the same. The sl-protrusion-gauge at the same time also compensates the opening rotation of the connectors caused by the foil thickness. By this, discrepancies to the registration are avoided to a greatest possible extent.

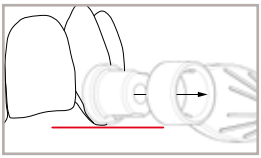
If no construction bite is available, the models are measured in the final bite position, the advancement is achieved by different length of measurement (25 or 23 mm) and connector length (24 or 22 mm) plus opening rotation (mostly + 2 mm).

Fabrication with construction bite (without construction bite see page 5)

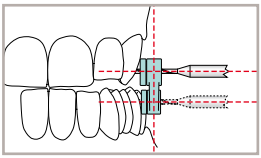


1. Cut the drilling shells off and put them in the measuring templates. The measuring template can be used with 23 or 25 mm length, also see hints.

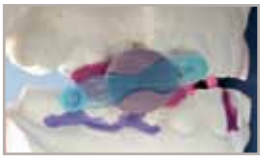
2. Articulate the models with a rubber band and with the cb removed from the sl-protrusion-gauge and cut to size.



Fix drilling shells and measuring template as near as possible to the occlusal plane.
Initial point is the upper canine or canine area.



Fix the measuring template with the drilling shells that way that a parallel drilling is possible.

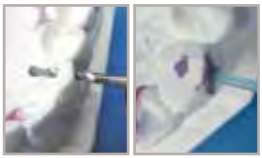


3. Fix the measuring template with Erkogum violet according to the drawings.
The lower pivot point results from the measurement (see hints).

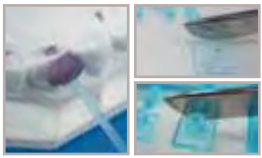
4. Cut the spacer holding pins. Drill with the 1.4 mm bur (**10 000 rev./min.!**) through the drilling shell first in the canine area into the model (3 mm depth of hole or more).

5. Before the hole in the lower jaw is drilled, put a spacer holding pin in the canine area through the drilling shell. Drill the lower jaw hole in the same manner.

6. Remove spacer holding pin, measuring template and Erkogum, the models can now be separated. Now put all 4 spacer holding pins into the drilling holes.

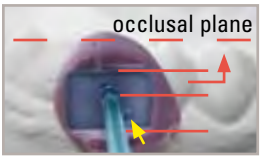


Hint for drilling: If the model has been drilled through, fix the spacer holding pin with Erkogum. Fix chipped plaster pieces and the pin with quick-acting glue.

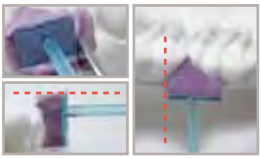


7. Put a poor quantity of Erkogum violet onto the pins.

Cut the modelling pads and the spacers without excess length.



8. Push one modelling pad with the nep (yellow arrow) outwards as illustrated onto the spacer holding pin and press it on as near as possible.



9. Remove excessive Erkogum with a knife. Undercuts between modelling pad and model have to be filled up.


10. Now push a spacer on and engage it at the modelling pad (see circle).


11. Shorten the spacer holding pins.
Mark the outer surface of the four spacers with a flipchart pen.

12. Marked spacers.

In the following the models are articulated in the Occluform. (also see Occluform instructions)

13. Articulate the models with the construction bite (Erkoform-3d/3/RVE). Leave the area below the spacer at least 6 mm free of granules.

14. Remove construction bite and keep it. Lower the bite at the supporting pin to a gap of app. 2 mm between the front teeth. Pull off the insulating foil of the Erkolen foil (1.0 mm)...

15. ...and keep it. The Occluform is opened, now thermoform, immediately put the Erkolen foil onto the model and close the Occluform.

16. A plane occlusal surface is created to avoid a later opening rotation by the foil thickness (the Erkolen foil can be reused).

17. Take the models out of the device and roughly cut out before removing the splint from the model (fissure bur > 20 000 rev./min.).

18. Carefully grind through the plate until the coloured marking on the spacers is just abraded,...


19. ...not more and not less (tungsten carbide bur > 20 000 rev./min.).
Ensure a plane surface.
Now remove the splint from the model.


20. Readjust the supporting pin of the Occluform to the broad marking (arrow). The lower swivel screw is screwed in (arrow), observe Occluform instructions.

21. Articulate the models in the Occluform, the lower jaw model is now in the model pot.
Open the Occluform and remove the construction bite.

22. Put the already roughly worked out upper jaw splint onto the upper jaw model. Leave the area below the spacer at least 6 mm free of granules.

23. Open the Occluform and press the insulating foil of the Erkolen foil with the sticky side onto the occlusal surface of the splint, if necessary cut the insulating foil back.

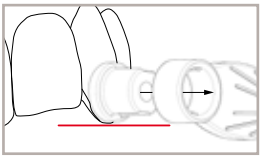
24. Now execute the second thermoforming step. As soon as the plate has been formed close the Occluform. Let the Occluform closed until the material has cooled down.

25. The occlusal conditions correspond now to the construction bite taken with the sl-protrusion-gauge.
...Continue at Finishing.

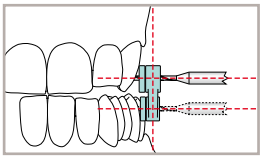
Fabrication without construction bite

1. Cut the drilling shells off and put them in the measuring template. The measuring template can be used with 23 or 25 mm length, also see hints.

2. Articulate the models with a rubber band in the final position.



Fix the measuring template and drilling shells as near as possible to the occlusal plane.
Initial point is the upper canine or canine area.



Fix the measuring template with the drilling shells that way that a parallel drilling is possible.

3. Fix the measuring template with Erkogum violet according to the drawings.
The lower pivot point results from measurement (see hints).

4. Cut off the spacer holding pins. Drill with the 1.4 mm drill (**10 000 rev./min.!**) through the drilling shell into the model, first in the canine area (3 mm depth of drilled hole or more).

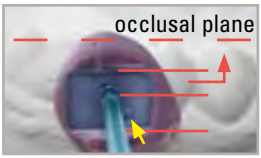
5. Before the hole in the lower jaw is drilled, put a spacer holding pin in the canine area through the drilling shell. Drill the lower jaw hole in the same manner.

6. Remove spacer holding pin, measuring template and Erkogum, the models can now be separated. Now put all 4 spacer holding pins into the drilled holes.

Hint for drilling: If the model has been drilled through, fix the spacer holding pin with Erkogum. Fix chipped plaster pieces and the pin with quick-acting glue.

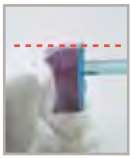
7. Press a poor quantity of Erkogum violet onto the pins.

Cut the modelling pads and the spacers without excess length.



8. Push one modelling pad with the nep (yellow arrow) outwards as illustrated onto the spacer holding pin and press it on as near as possible.

9. Remove excessive Erkogum with a knife.



10. Undercuts between modelling pad and model have to be filled up.

11. Now push a spacer on and...

12. ...engage it at the modelling pad (see circle).

13. Shorten the spacer holding pins.

14. Mark the outer surface of the four spacers with a flipchart pen.

Embed the models into the granules, leave the area below the spacer...

15. ...at least 6 mm free of granules.
Thermoform the models one after the other. Immediately after the adaptation put a 1 mm thick Erkolen foil without...

16. ...insulating foil and press it on along the teeth row especially in the area of the front teeth.
(do not stay too long at one place, **hot!**)

17. Premature contacts will be avoided as far as possible and the result is a plane occlusal surface.

18. Roughly cut out before removing the splint from the model (fissure bur > 20 000 rev./min.).

19. Carefully grind through the plate until the coloured marking on the spacers is just abraded, **not more and not less**!
(tungsten carbide bur > 20 000 rev./min.)

20. Ensure a plane surface.

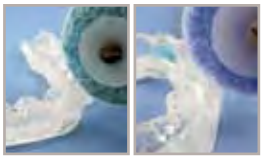
Now take the splint off the model.

...Continue at Finishing.

Finishing

1. Cut the final form with the HSS twist drill (>20 000 rev./min., without pressure), leave sufficient material (min. 2 mm) around the fixation points

2. Grind the borders with the tungsten carbide bur (>20 000 rev./min.).



3. Smooth the borders, grinded areas with Lisko-S, narrow zones and interdental spaces with Liskoid (both 10 000 rev./min.).

4. Polish Erkodur with polishing agent for plastics (polishing set, 110 878).

5. Erkoloc-pro can be „polished“ with the hot air burner (177 540), thereby only work on the model and do not heat the holes for the anchors (risk of deformation).

6. Press spacers inwards out of the splint (for ex. with the Lisko-S mandrel shank), it might be necessary to firmly press.

7. Remove the insulating / shrinkage compensation foil.

8. Cut the anchors as shown on the picture.

Take the anchors at the retaining lip and...

9. ...put them into the splint as replacement for the spacers.

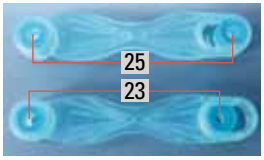
10. Firmly press into position, if necessary, also carefully with suitable pliers.

11. Cut the connectors, always opposing connectors have the same length.

Choose the connector length:

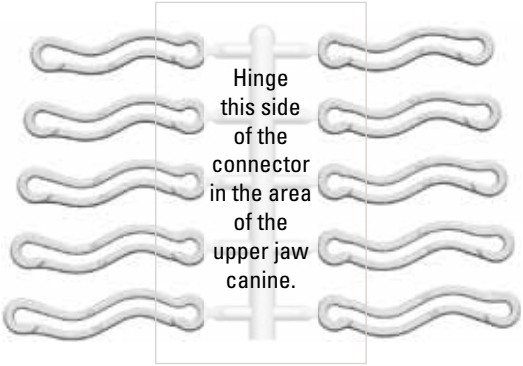
The connectors are exchangeable, for example if more protrusion is necessary for a sufficient effect.

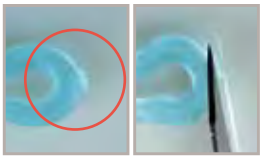
The shorter the connector is chosen in comparison to the measurement, the larger is the advancement of the lower jaw.



without cb:
measured, 23 / 25 mm
connector, 22 / 24 mm

with cb:
measured, 23 / 25 mm
connector, 23 / 25 mm

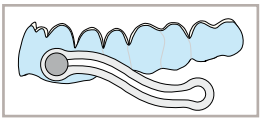


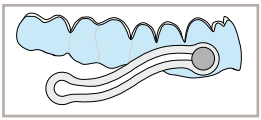


12. Remove sharp cutting edges!

13. Hinge the connectors into the long slot and pull it into its final position.

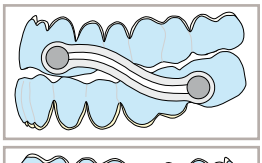
14. Observe upper jaw canine side of the connector.

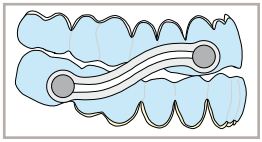




Obligatory run of the connectors, on the left and right.

15. Hinge the connector into the other splint.





Obligatory run of the connectors, on the left and right.

16. Please check correct positioning of the splint. In case of propulsion movements (feed) the connector shall slide out of the anchor of the lower jaw, see picture...

17. ...if not, hinge the connector about-face.

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