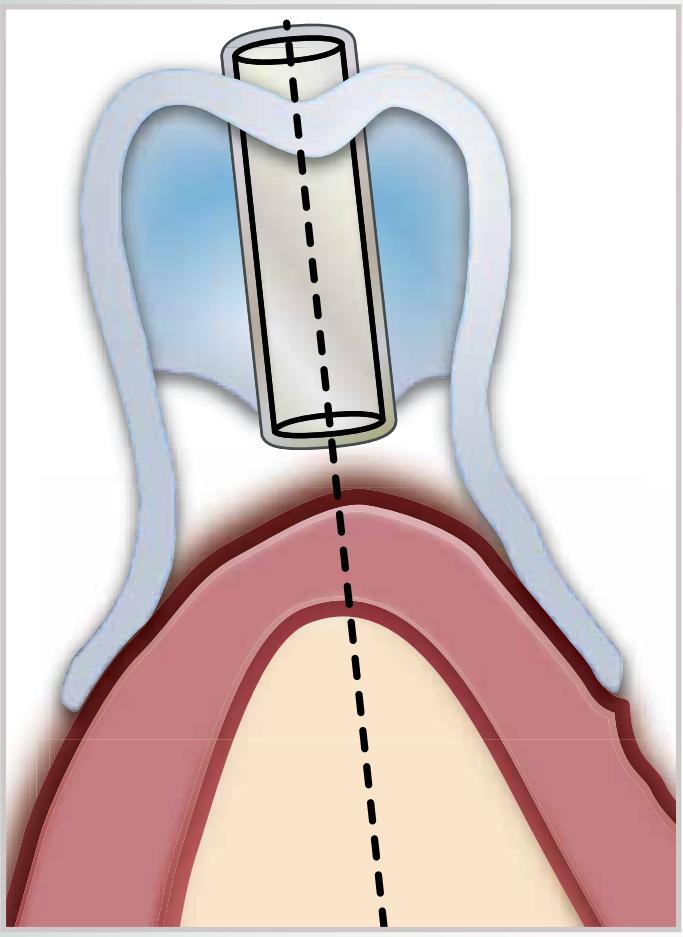
English

Thermoforming



ERKODENT®

Thermoforming technique

The instructions in this brochure are the suggestions of the Development Team of Erkodent.
The fields of use as well as the fabrication procedures in Thermoforming Technique are not limited to the instructions that are shown and may vary.
Please do not hesitate to contact us if you have any suggestions.

Basic principles of thermoforming:

- The **models** should consist of **hard plaster** (class 3).
- For thermoforming the **hard plaster** can contain residual moisture but **must not** be **wet**.
- For a good adaptation the **hard plaster** must be **permeable to air**, especially hard plasters for the orthodontic field do not always ensure this. Like when using plastic models or varnished models that are impermeable to air, this leads to incomplete adaptation because in most cases air cannot escape completely between the model and the foil.
- The removal of hard materials very often leads to a **break of models**. The use of super hard plaster does not solve this problem, it is better to thermoform on a duplicated model.
- It is useful to **embed the models** for thermoforming as far into the **high grade steel granules** that only the area that has to be thermoformed plus 3 mm is visible.
- The **granules** allow a **quick adaptation** of the thermoforming materials and a very simple limitation of the model height.
- When working on the **model disc** ensure that the **model base** is **trimmed flat**.
- **Model preparation:** Areas of the model (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.

Fill narrow gaps between the teeth with Erkogum (transparent 110 844/lilac 110 055).

Remove positive plaster bubbles.

Fill negative plaster bubbles and small defects with blocking out wax (transparent 725 080/lilac 725 055).

If the splint covers the gingival margin, relieve it with Erkoskin (625 050).

When there are large undercuts, mark the prosthetic equator to limit the height.

- The adaptation of thermoforming materials always means a **stretching** respectively a thinning of the original material thickness. A rough orientation is: **1 cm model height corresponds to 20 - 25 % loss of thickness**. For this reason it is expedient to embed the models into the granules.
- All **Erkodent thermoforming materials** are **physiologically harmless**, they are listed by the Health Authorities and are CE marked according to the EC directive 93/42/EEC with changes as per 2007/47/EC.
- Pay attention to the regulations for operational safety.

October 2013

Contents

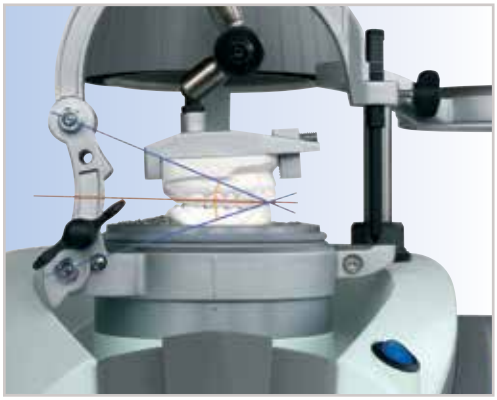
The function of the Occluform device

Occluform-3

The Occluform is an occludator that can be integrated in a thermoforming unit to **imprint the opposing bite** (pat. 19915567).

- The Occluform-3 can only be installed at the Erkoform-3d/3 units.
- It allows to directly imprint the opposing bite in the Erkoform-3d/3 during the thermoforming process!
- Plaster-free model fixation.
- The articulation of the models is ensured by a hydraulic system that can be fixed in every position.
- The single column construction enables best model accessibility.
- The construction of the Occluform-3 device is based on a Bonwill triangle with a side length of 11.5 cm and a Balkwill angle of 20°. That way it allows a median elevation of the bite.

(The Occluform (without supplement "-3") is only suitable for the Erkoform-RVE unit, the functionality is the same except for the missing semi-adjustability of the Occluform-3 (similiar to a semi-adjustable articulator). With the Occluform a median bite elevation is not possible, here for this reason always a construction bite should be used.)


The Erkoform-3d/3 units are prepared for the simple installation of the Occluform-3, the device will only be mounted with a single clamping screw on the thermoforming unit.

Hints

- Please carefully read the instructions of the Occluform device.
- Reduce models that exceed the inner dimensions of the retainer jaws in the model pot and that are too high for the total inner dimensions (both models articulated) by trimming.
- For very small models turn the retainer jaw that shows to the marking point at the edge of the model pot in order to avoid that the incisal point will move too much backwards.

Working with the Occluform device (illustrations: Occluform-3)

All thermoforming materials can be adjusted that means the opposing bite imprinted with the Occluform. However, thin foils cool off very fast and are less suitable. The thicker the used thermoforming material is the more time will be for the imprint.

1. Fix the lower or upper jaw model (release the correct joint of the Occluform, see instructions Occluform) in the model pot, the area that has to be thermoformed should protrude the edge of the pot.

2. Fix the antagonistic jaw onto the upper model plate. Prefix the model in a preferably high position with the arrest joint.

Close the Occluform.

3. Point the supporting pin on the 0-line (arrow), open the arrest joint and articulate the models.

The bite can be elevated to a median value.

4. If a construction bite is available the models are articulated in the same way (**3**).

That way the imprint corresponds exactly to the bite registration.

5. Hold the upper model plate in position and firmly close the arrest joint.
Open the Occluform.

Fill as many high grade steel granules in the pot that only the ...

6. ... thermoforming area plus 3 mm is visible. Ensure that also the hollow spaces under the model are filled with granules. Insulate the opposing bite (Isolac).

Now it can be thermoformed.

Occlusal splints with and without adjusted occlusion

Materials & Accessories

Fabrication:

- Hard splints: Erkodur, adjusted splints 1.5 - 5.0 mm, stabilization splints 0.8 - 1.5 mm
- Hard/soft splints: (2-layered) Erkoloc-pro, adjusted splints 2.0 - 5.0 mm, stabilization splints 1.0 mm
- Semi-soft splints: Erkoflex-95, adjusted splints (biting) 2.5 and 4.0 mm
- Tough-hard splints: Erkolign, 1.0 and 2.0 mm (at extreme stress, most resistant, but only limitedly adjustable)

- For adjustment by addition: Resilit-S (817 501) (817 503) auto-polymerizing resin for Erkodur and Erkoloc-pro, Erkoflexsticks-95 (177 006) with commercially available fusing gun, ≥ 500 W with screw-top (special top for fusing gun 177 010) for Erkoflex-95. If necessary, hot air burner (177 540) for the adjustment of Erkoflex-95.
- For adjustment by grinding (biting): Erkoform-3d, -3/Occluform-3 (Erkoform-RVE/Occluform)
- For model insulation and shrinkage compensation thermoform the ex works applied insulating foil together with the desired plate, in doing so the insulating/shrinkage compensation foil has to show towards the model (otherwise Isolac (624 050), only insulation).
- Cover templates (110 900) to cover the granules when using Erkoloc-pro and Erkoflex-95 (less loss of granules).

Model preparation:

- With large undercuts and hard splint material, parallelometer for marking the prosthetic equator.
- Erkogum (110 844) for blocking out, high-fusing wax (725 080) to fill bubbles in the plaster. • Erkoskin (625 050) to relieve the gingival margin.

Finishing:

- Recommendation: Finishing set Quick 2 (110 877) with fissure bur, rightward cutting, left spiral (110 836) for rough cutting out, HSS-twist drill (110 876) to cut out the desired form, crosscut tungsten carbide bur (110 837) for fine grinding, to prepolish the edges, Lisko-S (223 200) and narrow interdental spaces, Liskoid (223 205) • Pear-shaped tungsten carbide bur (110 835) for grinding-in.
- Polishing set (110 878) to polish Erkodur and Erkoloc-pro, hot air burner (177 540) to shine Erkoflex-95.

Hints

- This instruction is limited to the general fabrication of splints. Functional individualizations as required for the therapy with **reflex, repositioning, distraction, centric (Michigan) and many other type of splints** can be realized except for a few type of splints only with materials that are at least in the occlusal area hard.
- Areas of the model (exterior vestibulum, oral floor), which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- In order to have transparent splints out of Erkoloc-pro or Erkoflex-95 **without** insulating foil, the model should be insulated with Isolac.
- For splints that exceed the gingival margin apply a layer of Erkoskin to the margin to relieve tension.
- In order to avoid the creation of tension cracks brush the area that has to be built up with Resilit-S with little monomer before the splint is cut out or taken off the model.
- For splints out of Erkoloc-pro the hard layer may be ground through.

Occlusal splint without adjustment, for ex. stabilization splints

Thermoforming material: Erkodur, 0.8 - 1.5 mm, hard • Erkodur-A1/-A3, 1.0 mm, hard • Erkoloc-pro, 1.0 mm, soft/hard • Erkolign, 1.0 mm, tough-hard. In regard to fabrication the materials do not differ, in regard to finishing only slightly.

1. Pay attention to the hints for model preparation at page 1.

When there are thick undercuts, mark the prosthetic equator with a parallelometer and block out large undercuts.

2. If necessary (see hints), apply Erkoskin on the gingival margin.

Embed the models so far into the high grade steel granules that only the thermoforming area plus 3 mm protrude from the granules.

3. If applicable, cover granules with a cover template (Erkoloc-pro/ Erkoflex-95).

Thermoform.

4. Cut in the thermoformed plate with the fissure bur (> 20 000 rev./min.) for an easier removal of the model.

Use the twist drill HSS without pressure (> 20 000 rev./min.) to cut out the final shape.

5. If necessary, grind the edges with the crosscut tungsten carbide bur (> 20 000 rev./min.).

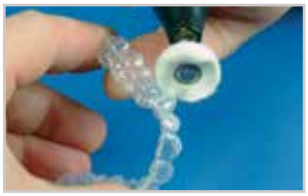
Smooth the edges with Lisko-S (10 000 rev./min.).

6. Smooth narrow interdental spaces with Liskoid (10 000 rev./min.).

Erkolign: smooth with Lisko-S and Liskoid and white silicone polishers.

It would be best to now take off the insulating foil.

7. If necessary, polish the matt areas with the polishing set using a lab handpiece, however, for these relatively thin splints a polish is mostly superfluous.



8. Finished stabilization splint.

Pay attention to the cleaning and maintenance instructions on page 34.

Occlusal splint with adjustment by reduction (grinding), for ex. centric splint

Thermoforming material: Erkodur, 1.5 - 5.0 mm, hard • Erkodur-A1/-A3, 2.0 mm, hard • Erkoloc-pro, 2.0 - 5.0 mm, soft/hard • Erkolign, 2.0 mm*, tough-hard. In regard to fabrication the materials do not differ, in regard to finishing only slightly.
*Because of its high shrinkage Erkolign, 2.0 mm should be provided with a further insulating foil, UZF-Plus, 0.1 mm.

9. Same procedure as up to point **6.**

Grind the splint as per the usual manner in the articulator according to the prescriptions. Recommendation: pear-shaped crosscut tungsten carbide bur (110 835).

10. Smooth and pre-polish the edges and grinding areas with Lisko-S respectively Liskoid (10 000 rev./min.).

11. Polish the matt areas with the polishing set using a lab handpiece.

Or polish at the polishing lathe according to the technique for plastics.

12. Finished splint, adjusted by grinding.

Pay attention to the cleaning and maintenance instructions on page 34.

Occlusal splint with adjustment by addition and grinding, for ex. Michigan splint

Thermoforming material: Erkodur, 1.5 - 5.0 mm, hard • Erkoloc-pro, 2.0 - 5.0 mm, soft/hard
In regard to fabrication the materials do not differ, in regard to finishing only slightly.

13. Same procedure as up to step **6.**

Brush areas that have to be adjusted with an autopolymer resin (Resilit-S) with little monomer.

See also next to last point of the hints!

14. Insulate the opposing bite (Isolac), put the splint back on the model, apply the mixed Resilit-S and brush the plate with monomer. Put the models in the articulator.

15. Close the articulator and cure in the polymerisation pot at 40 - 50 °C. After curing open the articulator carefully (model may break!) and remove the splint.

16. Finish the area that has been adjusted by addition and the splint (**9** to **12**).

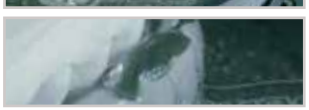
17. Finished adjusted Michigan splint produced by addition, with restored cuspid guidance.

Pay attention to the cleaning and maintenance instructions on page 34.

Hot foil material (Erkodur, Erkoloc-pro, 4.0/5.0 mm) can also be formed to a cuspid guidance in the unit by a manual moulding ...

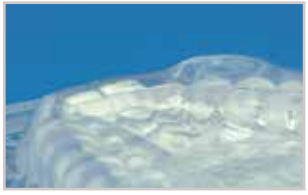
18. ... for this purpose it would be best to work with an Occluform installed at the Erkoform units (also see other chapters).

Take the bite with the Occluform ...



19. ... and immediately press the hot plastic foil material in the cuspid area with a suitable instrument against the antagonistic jaw.

20. After cooling take it off the unit and finish as described in step **9** to **12**.



21. Finished adjusted Michigan splint without addition, the splint consists in the occlusal area only of one material type.

Pay attention to the cleaning and maintenance instructions on page 34.

Soft occlusal splint with imprinted adjustment, for ex. relief splint

Thermoforming material: Erkoflex-95, 2.5 and 4.0 mm, Shore A 95

22. Addition: Erkoflex-95, 2.5 mm
Embed the models so far into the high grade steel granules that only the thermoforming area plus 5 mm protrude from the granules. Cover the granules with the cover template.


23. Thermoform, after cooling take it off the model and roughly cut out the shape with the fissure bur or the scissors, leave the shape longer than the final splint.

24. Pull the insulating foil off.

Put the splint back onto the model and degrease well with degreasing agent (613 050). Put the models into the articulator. Insulate the opposing bite (Isolac).


25. Apply material onto the required areas using the Erkoflexsticks-95 and a fusing gun (max. 2 cm length per application). Hold the point of the fusing gun very close to the splint.

26. In the articulator immediately imprint the opposing bite ...

... or build up all areas step by step and later on imprint the opposing bite as shown in step **31.**



27. Cut out the final shape of the splint with the HSS twist drill (> 20 000 rev./min). Work the built-up with the crosscut tungsten carbide bur (> 20 000 rev./min.).

28. Smooth with Lisko-S and Liskoid (10 000 rev./min.).

Carefully shine with the hot air burner.


29. Finished adjusted splint by addition.

Pay attention to the cleaning and maintenance instructions on page 34.

30. Imprint: Erkoflex-95, 4.0 mm

Same procedure as step **22** to **24**, however, without degreasing.


31. Warm occlusal area with the hot air burner until it becomes clear and imprint the opposing bite, see also step **26.**

Finish as shown in step **27** and **28.**

32. The imprint can also be done in the mouth. Therefore put the splint finished up to step **23** on the model into a flat bath with cool water. The occlusal area has to protrude from the water, ...


33. ... warm the occlusal area, see **31.** Briefly pour cool water over it, immediately remove the splint from the model and place it into the mouth. Obtain an occlusal registration. Allow to cool for 2 min. in the mouth and finish as shown in step **24.**

Imprint of the opposing bite in the Erkoform-3d/3 and Occluform-3 (Erkoform-RVE and Occluform)

Thermoforming materials: all types of materials that are listed in "Materials & Accessories" from 0.8* mm thickness and more, in the example Erkodur. The thinner the material is the quicker the Occluform device has to be closed after adaptation. *0.8/1.0 mm, fast proceeding required

34. In the example, fix the upper jaw in the model pot.

For the fabrication of an adjusted occlusal splint the model only has to protrude of the model pot by height of the teeth plus 3 mm.


35. Put the model pot that way into the unit that the markings (arrows) are opposite.

36. Fix the antagonistic jaw onto the upper model plate. Prefix the model in a preferably high position with the arrest joint.

Close the Occluform.


37. Point the supporting pin on the 0-line (arrow), open the arrest joint and articulate the models.

The bite can be elevated to a median value.

38. If a construction bite is available the models are articulated in the same way (**3**).

That way the imprint corresponds exactly to the bite registration.

39. Hold the upper model plate in position and firmly close the arrest joint.

Open the Occluform.

40. Fill as many high grade steel granules in the pot that only the thermoforming area plus 3 mm is visible. Ensure that also the hollow spaces under the model are filled with granules.

41. Insulate the opposing bite (Isolac).

Now it can be thermoformed. **Immediately** after adaptation close the Occluform until the supporting pin gets contact.

42. After the thermoforming material has cooled down open the Occluform. The imprint corresponds to the bite elevation or the construction bite.

43. Open the foil securing ring, lift the foil frame of the unit together with the model pot and take off the foil frame with the foil.

Finish as described in step **9** to **12.**

Imprint of the opposing bite with plane occlusion in the Erkoform-3d/3 and Occluform-3 (Erkoform-RVE and Occluform)

Thermoforming material: Erkodur, 3.0 - 5.0 mm, hard • Erkoloc-pro, 3.0 - 5.0 mm, soft/hard
In the example: Erkoloc-pro. The working steps have to be carried out quickly one after the other.

44. The plane occlusal surface will be pressed on with an Erkolen-foil, 0.8 mm or 1.0 mm and the Occluform. Thereto pull the insulating foil off (the Erkolen-foil can be used several times).

45. Carry out working steps **34 - 41** analogically.

The Erkolen-foil and foil frame should possibly be held and operated with one hand. Apply the Erkolen-foil **immediately** after the adaptation ...

46. ... and **immediately** close the Occluform so far that the supporting pin does not have contact yet (app. 3 mm opening) ...

47. ... **immediately** open the Occluform a little again, remove the Erkolen-foil and ...

48. ... **immediately** close the Occluform until the supporting pin gets contact.

By this mode of operation a plane occlusal surface with imprint of the cuspid tips will be obtained.

49. Take it out of the unit after cooling down and finish as described in step **9** to **12.**

Pay attention to the cleaning and maintenance instructions on page 34.

Temporary appliances

Materials & Accessories

Fabrication:

- Moulding as negative mould without bonding to acrylics for temporaries: Erkolen, 0.8 and 1.0 mm
- Moulding with bonding to acrylics for temporary appliances: Erkodur-C, 0.6 - 1.0 mm
- Moulding with bonding to acrylics for temporaries by the PV-Primer: Erkodur, 0.6 - 1.0 mm, Erkodur-A1/-A3, 0.6 and 1.0 mm
- PV-Primer for a durable combination of cartridge acrylics and liquid/powder acrylics with the foil types Erkodur (Erkodur-C only with cartridge acrylics).
- For model insulation and shrinkage compensation thermoform the ex works applied insulating foil together with the desired plate, in doing so the insulating/shrinkage compensation foil has to show towards the model (otherwise Isolac (624 050), only insulation).
- Cover templates (110 900) to cover the granules when using Erkolen (less loss of granules) (not absolutely necessary for the Erkodur types).

Model preparation:

- Erkogum (110 844) for blocking out, high-fusing wax (725 080) for filling bubbles in the plaster.

Finishing:

- Moulding: HSS twist drill (110 876) or scissors (220 300)
- Temporary appliance: crosscut tungsten carbide bur (110 837) for fine grinding, Lisko-S (223 200) for prepolishing the edges and Liskoid (223 205) for prepolishing narrow interdental spaces, polishing set (110 878) for polishing

Hints

- If the temporary appliance consists of a compound of foil and acrylic this leads to a considerable reinforcement of the temporary appliance.
- In the interdental gaps of the anatomic cast ready-made teeth or plaster teeth taken from other models can be fixed with Erkogum or high-fusing wax.
- Model areas (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- With suitable acrylics the adaptation can be done in the mouth, otherwise on the prepared model (described here).
- Inject the cartridge acrylic onto the still humid PV-Primer into the mould.

Temporary appliance combined of foil and acrylic

Thermoforming material: Erkodur, 0.6 - 1.0 mm, Erkodur-A1/-A3, 0.6 and 1.0 mm • Erkodur-C, 0.6 - 1.0 mm
In regard to fabrication and finishing the materials do not differ.

1. Fixed ready-made teeth.

Embed the models so far into the high grade steel granules that only the thermoforming area plus 3 mm protrude from the granules. If necessary, cover the granules (cover templates).

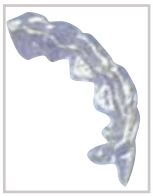
2. Thermoform and allow to cool down.

3. Cut in several times with the scissors towards the model for an easier removal. Remove the foil from the model and roughly cut it out.

4. Cut the desired shape with the HSS twist drill (> 20 000 rev./min.).
To avoid raising the bite, the cervical border should be shortened by app. 1 mm.

5. Pull the insulating foil off.

Finished mould out of Erkodur or Erkodur-C.



6. Finished mould out of Erkodur-A1.

Place the models into the articulator and articulate.

Insulate the model for the temporary appliance (Isolac).

7. For a durable combination the inner surface of Erkodur and Erkodur-A1/-A3 have to be brushed with PV-Primer. With the use of cartridge acrylics also Erkodur-C.

8. Pour in the acrylics in tough-flowing condition or inject with the cartridge (**9**).

9. Press the mould onto the edentulous area.

With suitable, mostly cartridge acrylics the adaptation can also be done in the mouth.

10. To avoid a raised bite and to compensate for the thickness of the foil, put the temporary appliance into occlusion with the opposing bite.

11. Grind the edges with the crosscut tungsten carbide bur (> 20 000 rev./min.).

12. Smooth and prepolish the edges with Lisko-S (10 000 rev./min.).

13. Smooth and prepolish narrow areas with Liskoid (10 000 rev./min.).

If desired, polish the prepolished areas with the polishing set.

14. Finished, break-stable temporary appliance out of a compound of foil (Erkodur or Erkodur-C) and acrylic.

Temporary appliance, only made of acrylic, fabricated with a negative mould

15. Proceed as described in step **1** and **2**.

Cut out the negative mould in a way that the edentulous area and at least one adjacent tooth on each side are included, see also step **16**.

16. Pull off the insulating foil.
Finished negative mould out of Erkolen.
Insulate the model (Isolac).
Pour in the acrylics in tough-flowing condition ...

17. ... and firmly press the negative mould onto the edentulous area.
To avoid a raised bite no acrylic may remain on the adjacent teeth.

After hardening take the blank off ...

18. ... the negative mould.
Finish as described in step **11 - 13.**
Finished temporary appliance.

Radiation protection splints

Materials & Accessories

Fabrication:
- Erkoflex, 4.0 and 5.0 mm, Erkoflex-95, 4.0 mm

Model preparation:
- When using plaster models: Erkogum (110 844) for blocking out, high-fusing wax (725 080) for filling bubbles in the plaster.

Finishing:
- Scissors (220 300), tungsten carbide bur (110 837) for grinding, Lisko-S (223 200) for prepolishing and hot air burner (177 540) for shining.

Hints

- Model preparation, fabrication and finishing see positioner, orthodontic field, page 21 - 22.
- Radiation protection splints reduce the implications of scattered radiation caused by materials of high density. This happens on the base of the distance-square-law of the radiation physics. The splints keep for ex. cheek and tongue in distance to the material of high density. The literature requires a distance of at least 3 mm.

1. The fabrication and finishing equates to the one for positioners, page 21 - 22.

The final shape is determined by the odontogram and the therapist.

2. Necessary adaptations can be effected with the strong scissors.

Radiation protection splint for upper jaw and lower jaw.

Cosmetic splints

Materials & Accessories

Fabrication:
- Erkodur-A1/-A3, 1.0 mm (2.0 mm, if the splint has to be adjusted)
- For a possible bite imprint: Erkoform-3d/-3 and Occluform-3 (Erkoform-RVE and Occluform)

Model preparation:
- To restore the tooth alignment, modelling wax (725 165), opaque-light beige (esthetic wax)

Finishing:
- Recommendation: Finishing set Quick 2 (also see occlusal splints page 4)
- A fine, flexible grinding disc to shape the interdental spaces. Polishing set (110 878) to polish

Hints

- Model areas (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- For model insulation and shrinkage compensation thermoform the ex works applied insulating foil showing towards the model together with the desired plate.
- Fabrication see stabilization splint, page 4 and 5. The splints can be put on cosmetically unfavourable teeth.

1. Cosmetically unfavourable initial situation, for ex. after an accident. The splint then also serves for stabilization.

2. The tooth alignment will be best restored with esthetic wax (modelling wax, 725 165, opaque-light beige).

3. For thermoforming the model should be duplicated.

Thermoforming and finishing see page 4 and 5, stabilization splint.

4. To obtain a better esthetic view the interdental spaces are more clearly accentuated ...

5. ... best with a fine flexible grinding disc.

6. Finished cosmetic splint out of Erkodur-A1.

Pay attention to the cleaning and maintenance instructions on page 34.

Bleaching and fluoride trays (gingival dressing)

Materials & Accessories

Fabrication:
- Recommendation: Erkoflex-bleach, 1.0 mm, Erkoloc-pro 1.0 mm and Erkoflex-95, 1.5 mm (all with insulating foil)
- Erkoskin (625 050) as spacer for bleaching trays (brush or spatula for application)
- Erkolen, 1.0 mm as spacer for fluoride trays
- Erkolen, 1.0 - 2.0 mm for gingival dressings

Model preparation:
- Erkogum (110 844) for blocking out, high-fusing wax (725 080) for filling bubbles in the plaster.

Finishing:
- HSS twist drill (110 876) or scissors (220 300) to precisely cut out the desired shape. Lisko-S (223 200) and Liskoid (223 205) to smooth the edges.

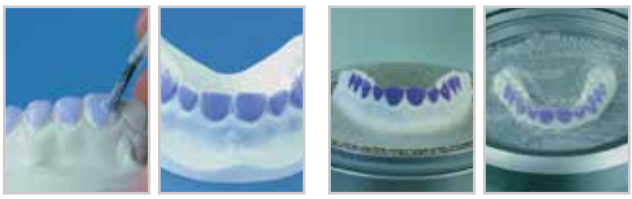
Hints

- Model areas (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- Erkoskin as spacer results per application in an app. 0.2 mm thick layer. Erkoskin has to be dry before thermoforming (app. 5 min. on plaster).
- If Erkoskin is applied with a brush, immediately rinse the brush with water.

Bleaching tray

Thermoforming material: Erkoflex-bleach, 1.0 mm, Erkoloc-pro 1.0 mm
Always thermoform together with the ex works applied insulating foil showing towards the model.

1. Apply Erkoskin as spacer with a fine brush (afterwards immediately rinse the brush) or with a small spatula.



2. Embed the model so far into the high grade steel granules that the tooth alignment plus 3 mm protrude from the granules. Cover the granules with a cover template.

Thermoform and allow to cool down.

3. Remove the plate from the model and roughly cut it out using the scissors.

4. Precisely cut out the bleaching tray along the gingival margin using the HSS twist drill (> 20 000 rev./min.).

If necessary, smooth the edges with Liskoid (10 000 rev./min.).

5. Pull off the insulating foil, in order to avoid deformations again and again follow up the splint.

6. Finished bleaching tray out of Erkoflex-bleach, 1.0 mm.

Pay attention to the cleaning and maintenance instructions on page 34.

Fluoride tray (gingival dressing)

Thermoforming material: see above, Materials & Accessories. **Gingival dressings** have the same or a bigger extent than fluoride trays, the area that has to be treated will either be relieved thinly with Erkoskin or more thick with Erkogum. **Gingival dressings** are made out of Erkolen (very inert material). **Always** thermoform together with the ex works applied insulating foil showing towards the model.

7. Thermoform Erkolen, 1.0 mm as spacer. Embed the model so far into the high grade steel granules that the tooth alignment plus 3 mm protrude from the granules. Cover the granules with a cover template.

8. Precisely cut out the spacer along the gingival margin using the scissors or the HSS twist drill (> 20 000 rev./min).

9. Put the finished spacer back onto the model and thermoform the fluoride tray onto it.

10. Embed the model so far into the high grade steel granules that the tooth alignment plus 10 mm protrude from the granules. Cover the granules with a cover template.

11. Thermoform and allow to cool down.

The fluoride tray passes the gingival margin with 6 - 8 mm, cut out accordingly with the scissors.


12. Remove spacer out of Erkolen, in order to avoid deformations, again and again follow up the splint.

If necessary, smooth the edges with Lisko-S (10 000 rev./min.).


13. Pull off the insulating foil, in order to avoid deformations again and again follow up the splint.

14. Finished fluoride tray out of Erkoflex-bleach, 1.0 mm.

Pay attention to the cleaning and maintenance instructions on page 34.

Individual impression trays (functional trays), base plates (bite plates)

Materials & Accessories

Fabrication:

- Recommendation for individual impression trays: Erkoplast-O, 3.0 mm (upper jaw), 4.0 mm (lower jaw)
  Erkorit, 2.5 mm (upper jaw), 3.5 mm (lower jaw)
- Recommendation for base plates: Erkoplast-R, 1.5 and 2.5 mm
  Erkoplast-O, 1.5 and 2.5 mm
- Erkoplast-O and Erkorit have at the same thickness more torsional strength than Erkoplast-R.
- Erkorit is crystal clear and allows to recognize pressure areas on the tray.
- As spacer Erkopor, 8 mm (110 842) for Erkopress- and 3 mm (110 845) for Erkoform-units.
- LG-tray handles (222 950) out of plastic, LG-Primer (222 960), tray handles out of aluminium (short 222 857, long 222 858, plastic for lower jaw 222 901).
- Wax bite rims for bite plates (hard 756 300, medium 756 302, soft 756 303).

Model preparation:

- Erkogum (110 844) for blocking out and for covering the residual teeth, high-fusing wax (725 080) for filling bubbles in the plaster.
- Rubber spacing rings (110 846) when using the model disc.

Finishing:

- Fissure bur, rightward cutting, left spiral (110 836), crosscut tungsten carbide bur (110 837) for grinding and Lisko brown (223 102) for smoothing the edges. Lisko-S (223 200) and Liskoid (223 205) for smoothing the areas around the LG-tray handle.

Hints

- Model areas (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- Carefully block out residual teeth and undercuts.
- If stops are required, cut holes into the spacer (Erkopor) in the area of the ridges (using punch pliers).
- If the models are placed into the granules, trimming the models is not necessary.
- The impression of the Erkopor and the smoothing of the edges with Lisko brown improves the retention for impression materials at the tray.
- Tray handles out of plastic reinforce the lower jaw tray when there is a flat ridge.

Individual impression tray

Thermoforming material: Erkoplast-O, 3.0 mm (upper jaw), 4.0 mm (lower jaw), Erkorit, 2.5 mm (upper jaw), 3.5 mm (lower jaw)

1. Block out residual teeth and undercuts with Erkogum.

Recommendation: Embed the model so far into the high grade steel granules that the tooth alignment plus 3 mm protrude from the granules.


2. If the model is placed onto the model disc, put the black rubber spacing ring around the flat trimmed model base. For better removal put some Erkogum to the rubber ring.

3. Put the Erkopor spacer directly onto the model.

(Contrary to previous details the Erkopor does not have to be humid!)

4. Thermoform and allow to cool down.

Before finishing, the application of the LG-tray handle during or after thermoforming will be shown.

5. The LG-Primer and heat ensure a safe bonding of the LG-tray handle with the tray material.

LG-tray handle and ridge should roughly fit together ...

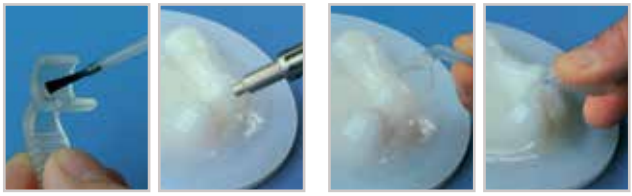
6. ... if necessary, adapt handle by heating.

7. Apply Primer app. 1 min. before application.

Immediately after adaptation press the LG-handle ...

8. ... into the hot, plastic tray material.

9. Later application of the LG-handle after the thermoforming process. For heating the thermoformed plate with the spacer have to be left on the model!
Apply Primer app. 1 min. before adaptation.

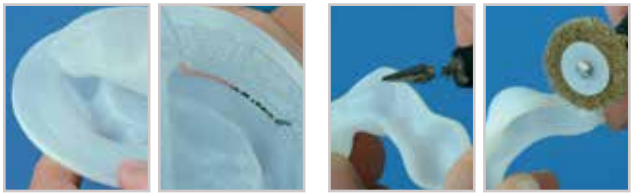


10. Heat until steam arises.

Press the LG-handle into the hot, plastic tray material.

11. Remove thermoformed plate and pull the spacer off.

Cut out the desired shape with a fissure bur, possibly mark it before.



12. Use the fine crosscut tungsten carbide bur (> 20 000 rev./min.) to work on the final shape and the edges.

Smooth the edges with Lisko brown.

13. Tray-handle out of aluminium, long: Put the tray with spacer onto the model and adapt the handle. Heat the handle base over a flame, press it into the plastic and flatten the fused material that extrudes.

14. Tray handle for stiffening the lower jaw tray: Adapt to the model by heating, fix with sticky wax (745 040) or Erkogum and thermoform the tray material onto it.

15. Finished, individual impression tray with LG-handle.

... with long handle out of aluminium

16. ... with short handle out of aluminium.

... with stiffened handle out of plastic.

Base plate (Bite plate)

Thermoforming material: Erkoplast-R, 1.5 and 2.5 mm, Erkoplast-O, 1.5 and 2.5 mm

17. Procedure as described in step **1 - 4**, however, without spacer.

Finishing as described in step **11** and **12**, use Lisko-S instead of Lisko brown.

18. Finished base plate (bite plate) with wax bite rim.

Denture bases, interim dentures

Materials & Accessories

Fabrication:
- Erkocryl rose or, if desired, also transparent 1.5/2.0/2.5 mm

Model preparation:
- Erkogum (110 844) for blocking out and for covering the residual teeth, high-fusing wax (725 080) for filling bubbles in the plaster

Finishing:
- Fissure bur, rightward cutting, left-spiral (110 836), crosscut tungsten carbide bur (110 837) for grinding and Lisko-S (223 200) for smoothing the edges.

Hints

- Model areas (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- Carefully block out residual teeth and undercuts.
- Not predried Erkocryl has to be dried before thermoforming in order to avoid the generation of bubbles, see trouble shooting, page 33.
- Erkocryl bonds seamlessly with acrylic for temporary appliances, it can be relined, adjusted and polished like acrylic for temporary appliances.
- Ready-made teeth and clasps for the fabrication of **interim dentures** can be prepolymerised with Resilit-S (powder, 817 501, clear/817 502, rose) (liquid, 817 503).

1. Embed the model so far into the high grade steel granules that the tooth alignment plus 3 mm protrude from the granules. Thermoform Erkocryl.

Cut out with the fissure bur (> 20 000 rev./min.) (see page 13, **11**).

2. Smooth and prepolish the edges with Lisko-S.

The denture base out of Erkocryl bonds to cold and hot curing acrylic resins.

Duplication moulds

Materials & Accessories

Fabrication:
- Erkoflex, 3.0 - 5.0 mm

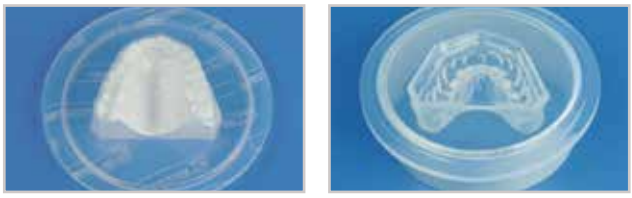
Model preparation:
- High-fusing wax (725 080) for filling bubbles in the plaster

Hints

- The duplication with Erkoflex is not as precise as the duplication with duplicating compounds. But this very low-cost method is suitable for demonstration, training and planning models.

1. Trim the model flat, put it onto the model plate in the thermoforming unit and thermoform.

Allow to completely cool down.



2. Put the formed Erkoflex as shown onto a ring or a pot in a way that the negative has contact only at the outside. Put in plaster while form is standing on the vibrating slab.

Dressing plates

Materials & Accessories

Fabrication:
- Erkodur, 1.0 - 2.0 mm
- Erkocryl, 1.5 and 2.0 mm

If required:
- For prepolymerisation of clasps: Resilit-S (817 501) (817 503) autopolymerising resin.
- For fabrication of the opposing bite imprint: Erkoform-3d/-3 and Occluform-3 (Erkoform-RVE and Occluform).
- For model insulation and shrinkage compensation thermoform the ex works applied insulating foil together with the desired plate, in doing so the insulating/shrinkage compensation foil has to show towards the model (Erkodur).

Model preparation:
- Erkogum (110 844) for blocking out, high-fusing wax (725 080) for filling bubbles in the plaster.
- Erkoskin (625 050) to relieve the gingival margin.

Finishing:
- Recommendation: Finishing set Quick 2 (110 877) with fissure bur, rightward cutting, left spiral (110 836) for rough cutting out, twist drill HSS (110 876) to cut out the desired shape, crosscut tungsten carbide bur (110 837) for final grinding, for prepolishing the edges, Lisko-S (223 200) and narrow interdental spaces, Liskoid (223 205).
- Polishing set (110 878)

Hints

- The fabrication and finishing is equal to the one for stabilization splints, page 4 - 5.
- Model areas (exterior vestibulum, oral floor) which obstruct the thermoforming process have to be removed. Remove sharp plaster edges.
- For splints that pass the gingival margin this one should be relieved by application of one Erkoskin layer.

1. If necessary (see hints), apply Erkoskin on the gingival margin.

Embed the model so far into the high grade steel granules that the tooth alignment plus 3 mm protrude from the granules.

2. Thermoform.

3. Cut in the thermoformed plate several times with the fissure bur (> 20 000 rev./min.) for an easier removal of the model.

4. Use the twist drill HSS without pressure (> 20 000 rev./min.) to cut out the final shape.

5. Thicker compression plates (2.0 mm) mostly have enough retention when covering only the palatinal side of the teeth.

6. Thin compression plates (1.0 and 1.5 mm) cover the tooth alignment scarcely beyond the vestibular border.

Pay attention to the cleaning and maintenance instructions on page 34.

Casting objects, copings

Materials & Accessories

Fabrication:
- Erkolen, soft, 0.5/0.6/0.7/0.8 mm, with shrinkage compensation foil 0.1 mm applied ex works
- Erkodur, hard, 0.5/0.6/0.8 mm, with shrinkage compensation foil 0.05 mm applied ex works (also possible, Erkodur-C, 0.5/0.6/0.8 mm with UZF-Cast spacer foil, clear 0.1 mm)
- Possibly, UZF-Cast spacer foil red, 0.1 mm or brown 0.15 mm
- Erkopor foam rubber discs (110 842)

Model preparation:
- High-fusing wax (725 080) for filling bubbles in the plaster, die spacer

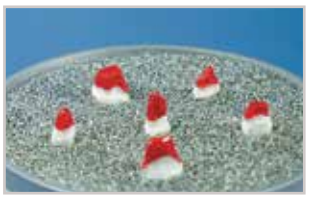
Finishing:
- HSS twist drill (110 876), scalpel

Hints

- The applied spacer foils compensate shrinkage of the foils which arises during the cooling procedure. Additional space for cement needs to be created extra (die-spacer).
- For dies with pins the die model disc is used, Erkopor serves for better ventilation and helps to avoid creases in the material.
- Some pin and model systems do not fit into the holes of the die model disc. These dies are embedded into the fine granules. The distance between the dies should be at least 2 mm and the margin should be at least 5 mm above the level of the granules.
- Scalpels, rolling knives or scissors crush the material when cutting. This can lead to deformations. Recommendation: cut out along a marked line with the HSS twist drill.
- The perforation of the possibly used UZF-Cast spacer foil avoids air bubbles between the foils.
- It is controversial whether the extension of the copings should be until the preparation limit or shorter, therefore we do not give any recommendation.

1. The die model disc has 7 holes filled with silicone mass to put the pins in.

If this is not possible ...



2. ... the dies are put into granules (granules, fine 110 861). Compress the granules well to avoid holes in the foils and to avoid that the dies sink during thermoforming.

3. Only die model disc:
Put the dies through the Erkopor disc into the silicone mass.

4. Ensure that the dies are put in a vertical position. Oblique dies with undercuts may cause creases.

5. Erkodur and Erkolen are ex works provided with a shrinkage compensation foil.

6. Thermoform, allow to cool down and continue at step **9.**

7. Foils without shrinkage compensation foil:
Perforate the UZF-Cast spacer foil several times between the dies using a scalpel or a needle.

With the spacer foil towards the dies ...

8. ... insert both foils into the foil frame and thermoform. After thermoforming it does not matter if there is air between the foils. Here Erkolen with UZF-Cast red.

9. Remove the Erkopor foam rubber disc cautiously. The Erkopor is reusable.

10. Cut out the dies. Mark the preparation limit ...

11. ... cut several times with the scalpel nearly up to the preparation limit and remove the copings.

Cut out the final form with the HSS twist drill.

12. Finished coping (see last point of the hints).

Drilling-, planning- and X-ray templates, orientation splints

Materials & Accessories

Fabrication:
- Erkodur, 1.0 - 5.0 mm
- Resilit-S (817 501) (817 503) autopolymerising acrylic to polymerise the drilling tubes
- Isolac (624 050) for model insulation

Model preparation:
- If necessary, parallelometer to mark the prosthetic equator.
- Erkogum (110 844) for blocking out, high-fusing wax (725 080) for filling bubbles in the plaster.

Finishing:
- Recommendation: Finishing set Quick 2 (110 877) with fissure bur, rightward cutting, left spiral (110 836) for rough cutting out, HSS twist drill (110 876) for cutting out the desired shape, crosscut tungsten carbide bur (110 837) for fine grinding, to prepolish the edges, Lisko-S (223 200) and narrow interdental spaces, Liskoid (223 205).
- Polishing set (110 878) to polish.

Hints

- Areas of the model (exterior vestibulum, oral floor) that obstruct the adaptation have to be removed. Remove sharp plaster edges.
- In order to avoid the creation of tension cracks brush the area that has to be built up with Resilit-S with little monomer before the splint is cut out or taken off the model.
- Finishing and thermoforming as described in page 4 and 5, stabilization splints etc.

Drilling template

Thermoforming material: Erkodur, 2.0 mm

1. Place ready-made teeth onto the edentulous space. Duplicate the model. Embed the duplicate into the granules according to the size of the desired splint and thermoform, see page 4.

2. In this case finish according to the illustration as described in page 4 and 5.

3. Cut out the space for the drilling tubes (or balls) as shown on the picture, the complete incisal and palatinal part of the respective frontal teeth.

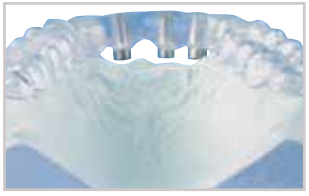
4. Apply the acrylate (Resilit-S) on the adjustable area using only little monomer.

Fill the desired free area between the splint and the mucosa with Erkogum.

5. Place the drilling tubes into the Erkogum material. For the alignment customary devices can be used.

6. It is necessary that Erkogum seals the area that will be filled with acrylate, if necessary, add Erkogum. Now fill in the acrylate (Resilit) and polymerise in a polymerisation unit.

7. Finished drilling template.



8. Finished drilling template.

Pay attention to the cleaning, maintenance and sterilisation instructions on page 34.

Orientation splint

Thermoforming material: Erkodur, 1.5 mm

9. Thermoforming and finishing as described in page 4 - 5.

Fix balls or similar with quick-acting glue (270 501) onto the desired position at the model.

10. Thermoform over the balls. This way the balls are firmly integrated in the splint.

Finish as described in page 4 - 5.

Bracket transfer / etching masks, bracket transfer splints

Materials & Accessories

Fabrication:
Bracket transfer splints:
- Erkoflex transparent, 2.0 mm, soft, flexible, excellently formable material with good memory
- Erkoflex-95 transparent, 1.5 mm, properties as Erkoflex but harder

Bracket transfer/etching masks:
- Erkolen, 0.8 - 1.0 mm, only recommended when using a pressure forming unit (Erkopress)
- Cover templates (110 900), water soluble adhesive (for ex. UHU universal adhesive without solvents), also syrup-like sugar water can be used, Isolac (624 050)

Model preparation:
- High-fusing wax (725 080) for filling bubbles in the plaster

Finishing:
- Special scissors (220 300) for cutting out the desired shape, Lisko-S (223 200) for smoothing the edges

Hints

- Areas of the model (exterior vestibulum, oral floor) that obstruct the adaptation have to be removed. Remove sharp plaster edges.
- The Erkoflex-types have a very high memory, they bound to original shape.
- Remove the ex works applied insulating foil before thermoforming, therefore, when using Erkoflex insulate (Isolac) the models before thermoforming.
- For easier removal of the foil after glueing the brackets, put small rubber rings around the brackets before thermoforming (not in case of bracket transfer/etching masks).
- When producing bracket transfer/etching masks, the places where the brackets should be glued (bracket base) are cut out with a scalpel. The etching agent will be applied through these holes and then the brackets will be glued on.

1. Glue brackets with water-soluble adhesive onto the model and put the rubber rings around them (not for bracket transfer/etching masks). If the model has a flat trimmed base, it can be placed onto the model disc ...

2. ... for thermoforming, otherwise embed the model that way into the granules that the tooth alignment plus app. 7 mm are visible. Cover granules with a cover template. Remove insulating foil before thermoforming.

3. To dissolve the adhesive put the model with foil for app. 10 min. into water. Take off the foil and cut it out. The splint should pass the gingival margin with about 5 mm. Smooth the edges with Lisko-S (10 000 rev./min.).

4. Depending on how many brackets should be glued on one time, they are segmented in groups or single. Thereby the cut should always be up to the palatal/lingual-occlusal edge.

5. To glue the brackets, the single segments can now be lifted without deforming the foil. Remove the foil after hardening of the adhesive.

6. Bracket transfer/etching mask out of Erkolen with cut out etching and transfer windows.

Correction splints and retainer

Materials & Accessories

Fabrication:
- Erkodur, hard, 0.6 - 1.5 mm (0.6/0.8 mm for Essix retainer, 1.0/1.5 mm for correction splints)
- Pliers to camber correction splints
- Erkolign, tough-hard, 1.0 mm and Erkoloc-pro, hard/soft, 1.0 and 1.3 mm. Further materials see page 4, stabilization splints.

Model preparation and finishing see page 4, stabilization splints.

Hints

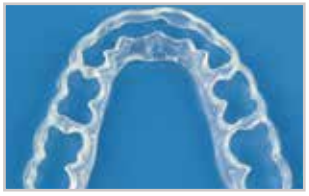
- There are many ways of fabricating a retainer, here only a small selection. Most can be fabricated with the thermoforming technique and correspond mostly to stabilization splints. Example, retainer that does not have a negative effect on the occlusion (Erkodur 1.5 mm).
- With the help of the Occluform it is possible to imprint the opposing bite in Erkoform units during thermoforming. Proceeding very fast this is even possible from material thicknesses of 0.8 mm and more. Such retainers will not interfere the occlusion negatively.

1. Mark the dimensions of the retainer. Before determine in the articulator where the bars between the vestibular and palatinal area can be placed without interfering with the occlusion.

2. Cut out the splint, the occlusal surfaces and the bars using the HSS twist drill without pressure (> 20 000 rev./min.).

3. Finish the edges with the tungsten carbide bur (if clasps are included: Attention, the tungsten carbide bur may damage the clasps).

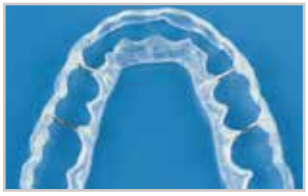
Smooth the edges with Lisko-S (10 000 rev./min.).



4. Finished retainer with bars out of thermoforming material, not influencing the occlusion.

Pay attention to the cleaning and maintenance instructions on page 34.

5. Finished retainer with bars out of wire that does not have a negative effect on the occlusion.



6. The Essix retainer is a thin splint reduced to the frontal area.
The fabrication is analogical to the fabrication of stabilization splints.

7. Correction splint: The teeth that have to be moved are blocked out in direction of the movement (Erkogum or high-fusing wax). Thermoform Erkodur 1.0 mm with insulating foil, finish.

8. To create an impulse for movement, camber the splint with the pliers at the appropriate part. Neither Erkodur nor the pliers have to be heated for cambering.

9. Erkolign is an extremely resistant material, but has a high shrinkage. Recommendation: add a UZF-Plus onto the ex works applied insulating foil.

10. A retainer fabricated this way stays with low tension on the tooth alignment.

Pay attention to the cleaning and maintenance instructions on page 34.

Expansion-, orthodontic- and retention plates

Materials & Accessories

Fabrication:
- Erkocryl, clear, 2.0 and 2.5 mm or coloured on request
- Resilit-S, clear or pink, to polymerise clasps

Model preparation:
- Erkogum (110 844) for blocking out, high-fusing wax (transparent 725 080/lilac 725 055) for filling bubbles in the plaster, Isolac (624 050) for model insulation.

Finishing:
- Recommendation: Finishing set Quick 2 (110 877), fissure bur, rightward cutting, left spiral (110 836) for cutting out the desired shape, crosscut tungsten carbide bur (110 837) for grinding, HSS twist drill (110 876) to uncover the clasps. Lisko-S (223 200) for smoothing the edges and Liskoid (223 205) for polishing the interdental spaces.

Hints

- The model has to be well degreased with Isolac, only then the autopolymer Resilit-S can polymerise transparently and free of bubbles in the pressure forming unit (Erkopress).
- The HSS twist drill does not damage the clasps. Use the HSS twist drill without any pressure (> 20.000 rev./min.).

1. At first bend the clasps and mill a slot into the model to position the expansion screw.

Well insulate the model (Isolac).

2. Cut the holding part of the expansion screw and put the screw into the slot milled into the model.

3. Fix the clasps onto the buccal surfaces with sticky wax.

4. For easier removal and finishing cover the occlusal and vestibular surfaces of the teeth with Erkogum.

5-7. Thermoform in the pressure forming unit (Erkopress).

5. Warm the Erkocryl plate in the thermoforming unit. During this the model is embedded into the granules. The palatinal area remains visible and the granules should cover the vestibular area to the occlusal border.

6. Shortly before thermoforming (20 sec.) apply few drops of Resilit-S onto the retention areas of the clasps and the expansion screw. Afterwards thermoform.

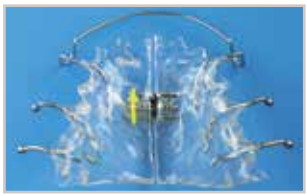
7. To ensure the complete polymerisation of the acrylic, leave under pressure for at least 5 minutes. Then remove the plate from the model. The model will break in most cases.

8. Roughly cut out the plate with the fissure bur. The HSS twist drill is used for fine cutting out and for uncovering the clasps.

9. Separate the plate using the HSS twist drill. The material can also be sawed or worked with a separating disc.

10. Finish the edges with the tungsten carbide bur (attention in the area of the clasps, the tungsten carbide bur may damage the clasps).

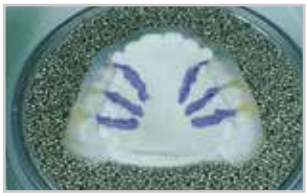
11. Smooth the edges with Lisko-S (app. 10 000 rev./min.).
Erkocryl can be polished in the common manner.



12. Finished expansion plate out of Erkocryl, transparent 2.0 mm.

Pay attention to the cleaning and maintenance instructions on page 34.

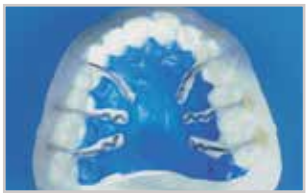
13. Fabrication of a retention plate in a vacuum forming unit (Erkoform units). In addition to the preparation in step **4** a thick layer of Erkoskin (625 050) will be applied onto the retention ends of the clasps.

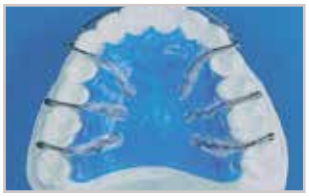


14. Embed as shown on the picture in step **13** and thermoform.

Because of the Erkoskin the plate can be easily removed without clasps and their positions are clearly imprinted.

15. Finish the plate and use the fissure bur to cut the imprints of the clasps free. Reput the plate onto the model and fill the free spaces around the end of the clasps with autopolymer (Resilit-S).





16. The polymerisation can be done classically in a polymerisation pot.

Finished retention plate out of Erkocryl, blue, 2.0 mm.

Positioners

Materials & Accessories

Fabrication:
- Erkoflex transparent or coloured, as a rule 4.0 mm
- Cover templates (110 900), degreasing agent (613 050), Erkoflexsticks-82 (177 005) with commercially available fusing gun ≥ 500 W with screw-top (special top for fusing gun 177 010), hot-air burner (177 540)

Model preparation:
- High-fusing wax (725 080) for filling bubbles in the plaster and for fixing the set-up model if no duplicate is used.

Finishing:
- Special scissors (220 300) • FG-sheets (177 400) • Tungsten carbide bur (110 837) • Lisko-S (223 200) • Liskoid (223 205)
- Hot-air burner (177 540)

Hints

- Areas of the model (exterior vestibulum, oral floor) that obstruct the adaptation have to be removed. Remove sharp plaster edges.
- Normally the desired spacing of the positioner is smaller than the spacing that results after thermoforming in the molar area. Therefore the combination of upper and lower splint by heat is normally possible. This method has optical advantages compared to bonding the two splints with the fusing gun.

1. Embed the model that way into the granules that the tooth alignment plus app. 7 mm are visible. Cover the granules with a cover template.

2. Always thermoform the plate together with the ex works applied insulating foil and allow to cool down.

3. Cut the splint with the special scissors to the requested length.

4. Use the tungsten carbide bur (> 20 000 rev./min.) to roughly grind the edges.

5. Smooth with Lisko-S (10 000 rev./min.).

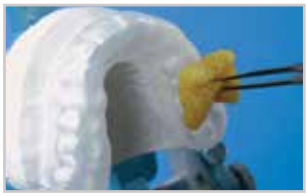
6. Pull the insulating foil off.

7. Produce a splint for the other jaw in the same manner.

Place the models in the articulator and adjust the desired spacing at the supporting pin.

8. In the articulator the splints normally touch in the molar area. Remove on both sides that much material that only 1 - 2 mm are missing to the desired spacing.

9. Remove the material equally on both sides in the occlusal area. If a lot of material has to be removed, the tungsten carbide bur has to be used.



10. Degrease the occlusal surface of both splints with degreasing agent.

11. Warm only the occlusal area of both splints with the hot-air burner. Do not remain on one spot too long.

12. Press both heated splints rapidly until it stops together.
The combination can no longer be separated.

13. Open areas and areas that do not have enough material can be filled with Erkoflexsticks-82 (original Erkoflex) and a fusing gun.

14. The stick material and the positioner can be smoothed with Lisko-S and polished with the hot-air burner.
The hot surface can be polished by shortly pressing a FG-sheet onto it (page 24, **14**).

15. If the positioner should have a high elevation, both splints can be bonded by application of Erkoflexsticks-82 material.

16. Finished Positioner out of Erkoflex, 4.0 mm.

Pay attention to the cleaning and maintenance instructions on page 34.

17. Bonding of the upper and lower jaw splints in the **Occluform:**
Procedure as described in step **1 - 4.**
Only one splint will be fabricated.
Grind the splint thin especially in the molar area (Lisko-S).

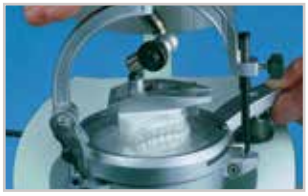
18. How much material has to be removed depends on the desired bite elevation.
Fix this model without splint in the upper model plate.

19. Articulate the models according to the construction bite, arrest the Occluform, open it and put the splint onto the model.

Degrease splint and the foil next to thermoform with degreasing agent.

20. Now thermoform an Erkoflex plate onto the model in the model pot and close the Occluform and ...

21. ... press on until the supporting pin gets contact and allow to cool down.



22. Both splints bond safely to a monobloc.
Finish as described in step **11** and **12.**

Materials & Accessories

Fabrication:
- Erkoflex, flexible, transparent and coloured, 2.0 and 4.0 mm • Erkodur-S, hard, 0.8 mm as hard insert for Playsafe heavy-pro and light-pro
- Playsafe label (light 216 012, medium 216 013, heavy-pro 216 015, light-pro 216 018), Playsafe label (mirror writing: light 216 002, medium 216 003, heavy-pro 216 005, light-pro 216 008) • Isolac (624 050) • Degreasing agent (613 050) • Commercially available fusing gun, ≥ 500 W with screw-top (special top for fusing gun 177 010) • Erkoflexsticks-95/-82 (177 006/177 005) • Cover templates (110 900)

Model preparation:
- Erkogum (110 844) for blocking out, high-fusing wax (725 080) for filling bubbles in the plaster.

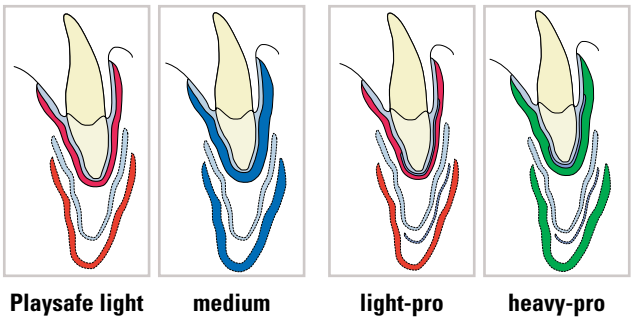
Finishing:
- Special scissors (220 300) • FG sheets (177 400) • Tungsten carbide bur (110 837) • Lisko-S (223 200) • Liskoid (223 205)
- Hot air burner (177 540)

Hints

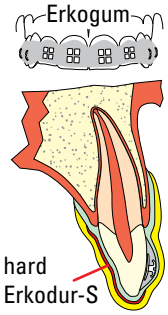
- For an optimum mouthguard the upper jaw model should represent the vestibulum completely.
- For determining the bite situation, ideally a construction bite with a spacing of 4 - 5 mm should be available.
- If the model is insulated, the insulating material must be washed off before using the hot-air burner in order to avoid black stains.
- If Erkoflex transparent shall be used as second layer, remove the insulating foil before thermoforming.

Playsafe types:

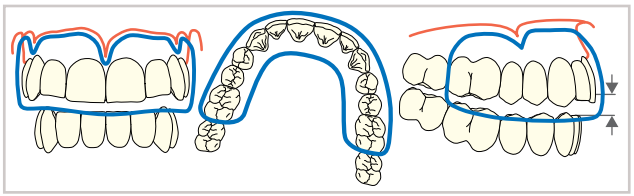
Playsafe light:
Erkoflex 2.0 mm + Erkoflex 2.0 mm
Playsafe medium:
Erkoflex 2.0 mm + Erkoflex 4.0 mm
Playsafe light-pro:
Erkoflex 2.0 mm + Erkodur-S 0.8 mm + Erkoflex 2.0 mm
Playsafe heavy-pro:
Erkoflex 2.0 mm + Erkodur-S 0.8 mm + Erkoflex 4.0 mm



Heavy-pro can for a short period of wear also be fabricated for patients with brackets. Impression without wiring, block out bracket and wire area with Erkogum.



A Playsafe sports-mouthguard is always fabricated for the upper jaw. To protect the root zone, it covers as much as possible of the vestibulum.



The Playsafe sports-mouthguard covers the first molar.
The increase of occlusion is 4 - 5 mm at the incisal point. In most cases the blockage is done on average values.

1. Model preparation: Fill plaster bubbles with blocking out wax. Block out undercuts of a possible gap (special case) with Erkogum.

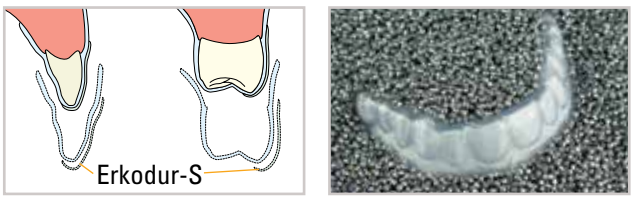
2. Embed the model in a way that the entire vestibulum remains visible.

3. Always thermoform the first layer (Erkoflex 2.0 mm) together with the ex works applied insulating foil and allow to cool down. Cut out with special scissors, leave everywhere a little bit longer as the final mouthguard.

4. Special case: On the first layer the gap is filled with Erkoflexsticks-95/-82 (fusing gun).
Smooth applied stick material with Lisko-S.

5. Do not attach type labels near to the fraenulums. The labels are readable from the inside. For a transparent Playsafe there are labels available that are readable from the outside.

6. - 9. only light-pro / heavy-pro:
The hard Erkodur-S (0.8 mm) completely covers the vestibular area and just barely the incisal edge and the vestibular/buccal edge.



7. Embed model with the first layer into the granules, only the area of the later hard Erkodur-S layer plus 2 mm remain visible.

8. Degrease visible area (degreasing agent 613 050, ensures a reliable bond of the layers).

9. * Position of the hard layer at patients with vestibular brackets.

Additionally degrease the side of the Erkodur-S that has to be applied onto the first layer and thermoform.

10. Take the foil compound off the model and roughly cut out with the scissors.



11. First with the tungsten carbide bur, then with Lisko-S grind and smooth the hard protruding edge.

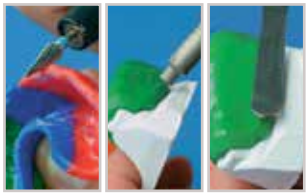
The limitation of Erkodur-S is visible as a line. Reput the first layer onto the model and ...

12. Without Occluform/-3: ... embed the model (2) and apply a cover template. Well degrease first layer(s) and the model side of the second plate. Pay attention to the alignment of model and multi-coloured plates.



13. Take the foil off the model, then firstly remove the cover template, secondly the insulating foil.

14. Cut out the mouthguard with special scissors as per the extensions described formerly, exposing the area around the fraenulums well.



15. Roughly work out with the tungsten carbide bur (> 20 000 rev./min.) and reput the mouthguard onto the model. Heat the cut-open air pockets with the hot-air burner and seal with the blunt end of a wax knife or ...

16. ... in case of larger air pockets press on with a FG-sheet.

Smooth with Lisko-S and narrow spaces with Liskoid (both 10 000 rev./min.).

Reput onto the model and ...

17. ... shine with the hot-air burner, thereby do not remain for too long in one position. The hot surface can be smoothed and polished by shortly pressing on the FG-sheet.

18. Imprint opposing bite in the articulator:
Fix model with the worked mouthguard in the articulator. Block 4 - 5 mm with the supporting pin. Insulate opposing bite (lower jaw teeth).

19. Heat occlusal surface of the mouthguard.
Thereby stroke the hot-air burner slowly about 20 times over the occlusal surface.

20. Make imprint of the opposing bite and allow to cool down.

21. For a much better wearing comfort grind away the details of the impression with Lisko-S whilst retaining a vestibular wall.

22. Heat occlusal surface one more time and close the articulator.

23. Finished Playsafe sports-mouthguard.

Pay attention to the cleaning and maintenance instructions on page 34.

24. With Occluform-3: Imprint the opposing bite during thermoforming:

Fix the model in the model pot that high that the first layer can be put back onto the model.

25. Articulate the models with a construction bite in the Occluform or, like shown here, at average values* by lifting the supporting pin at 3 - 4 scale-lines and arrest the joint.

*only Occluform-3

26. Insulate the opposing bite with Isolac (colourless). Cover the granules with a cover template. Degrease well the first layer and the model side of the second layer.


27. Thermoform the second foil and immediately close the Occluform until the supporting pin gets contact.

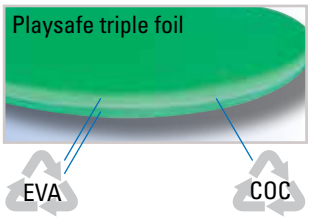
28. After cooling down open the Occluform and take out the model together with the model pot.

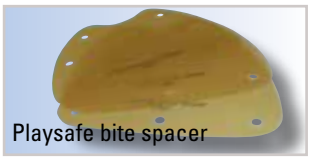
Finish as described in step **13 - 17**.

29. Finished Playsafe sports-mouthguard.

Pay attention to the cleaning and maintenance instructions on page 34.

PLAY SAFE® triple sports-mouthguard





Materials & Accessories

Fabrication:
- Playsafe triple start set (177 810): 1 Playsafe triple set, transparent, 1 Playsafe bite spacer, 1 Playsafe face chuck
- 1 Playsafe triple set (177 820): 1 Playsafe triple foil (colour has to be indicated), 1 label, 1 Erkobox, 1 sample FG-sheet, instructions
- 5 Playsafe triple foils (177 825), colour has to be indicated, 5 labels

Model preparation:
- Erkogum (110 844) for blocking-out, high-fusing wax (725 080) to fill bubbles in the plaster

Finishing:
- Finishing set Quick 2 (110 877) • Hot air burner (177 540)

Hints

- For an optimal mouthguard the upper jaw model should represent the entire vestibule.
- To determine the bite proportions there is ideally a construction bite available with a spacing of 3 - 4 mm.
- The easiest and quickest way to fabricate a Playsafe triple is with the units Erkoform-3/-3d and -3d *motion* with Occluform-3.
- With some additional efforts the fabrication is also possible with the Erkopress 300 Tp/Tp-ci units. The Erkoform-RVE and all former units, in which the 5.5 mm thick Playsafe triple foil cannot be clamped, are not suitable.

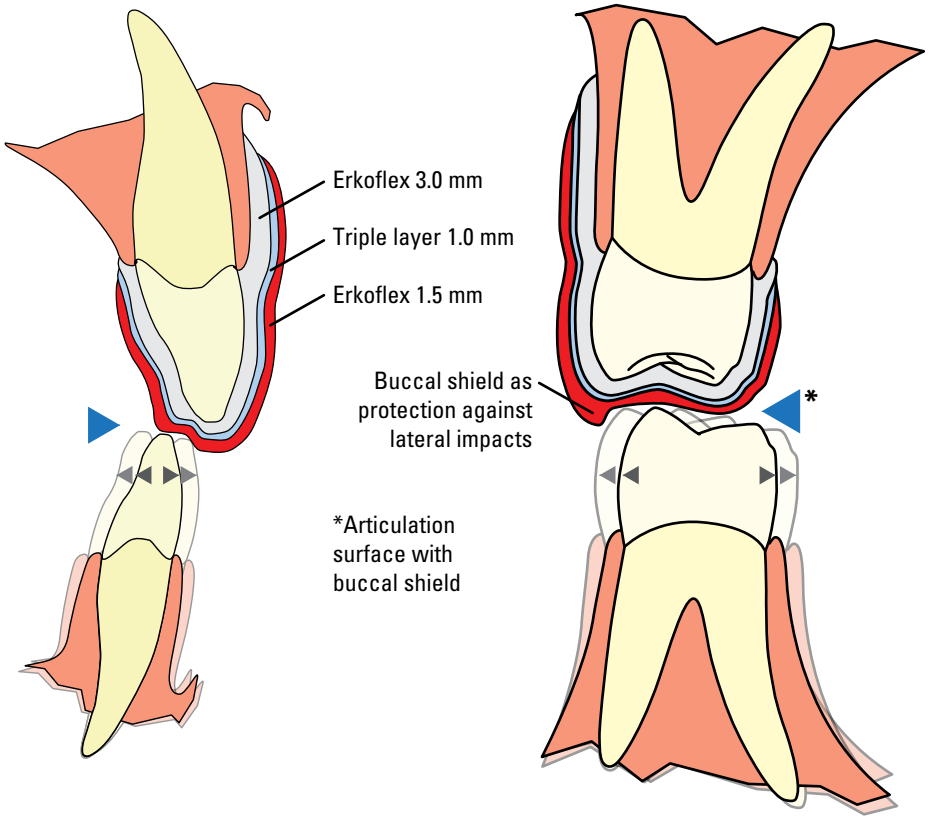
Playsafe triple:

The better protective effect of laminated sports mouthguards in comparison to single-layered mouthguards is sufficiently known. However, the fabrication of laminated sports-mouthguards is much more complex.

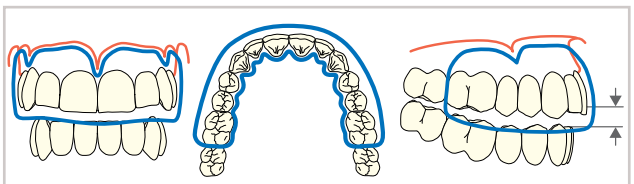
A Playsafe triple can be fabricated in about the same time as a single-layered sports-mouthguard but provides at least the same protective effect at smaller proportions than the laminated top version Playsafe heavy-pro.

The Playsafe triple plate is already three-layered, inside and outside soft and in between hard. Thermoform once and imprint the articulation surface in a tricky way, allow to cool off and elaborate, if desired, also apply the label, finished.

The surface that allows movement for the athlete automatically shows a lateral stop (buccal shield) by the imprinting. This can absorb lateral impacts.



A Playsafe triple sports-mouthguard is always fabricated for the upper jaw. It covers as much as possible of the vestibule and ends palatinally about 1 mm in the gingival area.



The Playsafe triple includes the first molar. Depending on the bite proportion the bite-lifting is 3 - 4 mm at the incisal point.
Mostly it has to be lifted at average values.

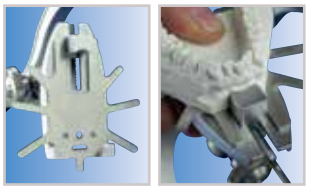
Model preparation: Fill plaster bubbles with blocking out wax. Block-out undercuts of a possibly existing gap (special case) with Erkogum.

Trim the lower jaw model near to the teeth row. The lower jaw model can be used even if only half of the tooth height is represented.

Fabrication with the Erkoform-3/3d*/3d*motion** and Occluform-3

* if required program the Playsafe triple foil information (see foil packaging) as new foil.

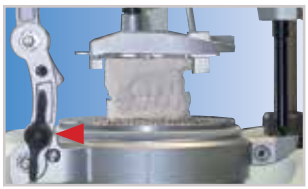
1. Fix the upper jaw model in the Occluform-3 model pot, the vestibule has to protrude from the edge of the pot. Fill the pot with granules, shake the pot to ensure that the granules will get underneath the model as well.

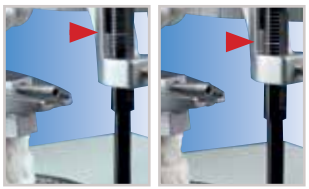


2. Put the Playsafe face chuck into the upper model disc and fix the lower jaw model onto it.

Recommendation for the adjustment of the Occluform-3 in deep bites: ...

3. ... only for the fabrication way shown here block the lower joint. This leads to more free moving space of the lower jaw on the articulation surface.





4. Occludate the models in the Occluform-3 in the final bite position or with a construction bite. If working without construction bite lift the bite for 3 - 4 scale marks. Open the Occluform-3.

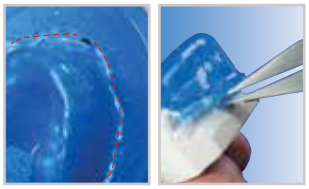
5. Clamp the Playsafe triple foil into the foil reception, the isolating foil showing towards the model.

6. While the foil gets heated clip the Playsafe bite spacer onto the face chuck as shown.

7. Thermoform, do not close the Occluform-3 yet. **Wait for one minute of the cooling time (9:00 on the display) and only then close the Occluform-3 until the support pin gets contact!**

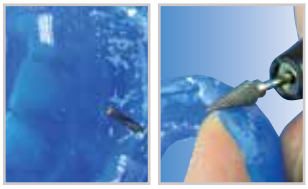
8. Implicitly await the entire cooling time and only then open the Occluform-3 again.

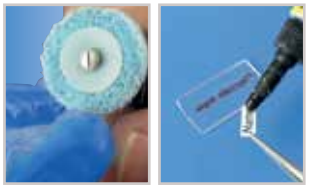
9. Lift the foil reception, loosen the foil securing ring and remove the foil together with the model pot through the foil reception. Loosen model and remove it.



10. Best take the foil with the take-off pliers (110 880) off the model.

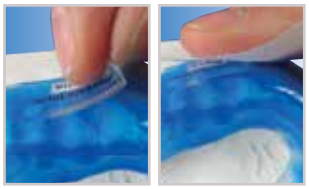
11. Cut out the Playsafe triple with the fissure bur and grind it with the tungsten carbide bur.





12. Smooth with Lisko or at narrow spaces with Liskoid. Reput the sports-mouthguard on the model and fix the label, perhaps provide the label with the name of the athlete.

13. Write down the name on paper (or similar) and fix it with quick-acting glue that way that the writing shows towards the printed side of the label.



14. Heat the label area with the hot air burner (respectively first practice with a leftover of a foil) and put the label on top, attention, it cannot be removed anymore. Press on the label with the FG sheet.

15. If necessary, heat the edge of the label again and press it on with the FG sheet. Allow to cool down and smooth it with Lisko-S or Liskoid (10 000 rev./min.). Take it off the model and remove the isolating foil.

16. Break and smooth the vestibular inner edge (Lisko-S or Liskoid).

Put it back onto the model and shine the Playsafe triple with the hot air burner, finished.

Fabrication with the Erkopress 300 Tp*/Tp-ci*

Thermoform the Playsafe triple foil with the entire vestibule.
Best take the foil off the model with the take-off pliers (110 880) and finish it (see **10.**, **11.** and **12.**).

1. Fix the models with plaster into an articulator, in doing so insert 7 suitable clamping pins (e.g. old drill shafts) underneath the lower jaw model into the still soft plaster.

2. Clamp in the Playsafe bite spacer. Properly heat the occlusal surface of the Playsafe triple with the hot air burner (stroke the hot-air burner slowly about 40 times! at a short distance over the occlusal surface).

3. Block the bite at about 3 - 4 mm and imprint the articulation surface.

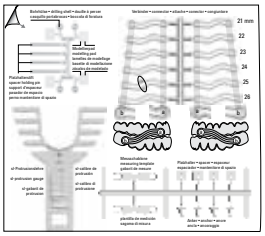
All further working steps as described above.

Silensor-sl • Fabrication

Materials & Accessories

Fabrication: (Video showing the fabrication: **www.erkodent.com** > Service > Video)

- Silensor-sl Set (59 60 11, foil Ø 120 mm, EN) or single components.
- Erkodur/*freeze*, 2.0 or 3.0 mm, hard, necessary for the fabrication of the lower jaw splint in case of poor retention.
- Erkoloc-pro/*blu*/*green*, 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.



Model preparation:

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

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.

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. Should the patient despite of bite taking not tolerate the advancement, the 26 mm connectors can be put in. 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.

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.).

Fabrication

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.

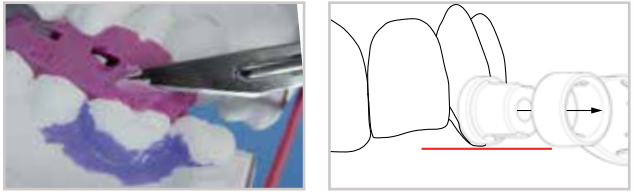
If no construction bite is available, the models are measured in the final bite position, the advancement is achieved by different length of measurement (25 or 23 mm) and connector length (24 or 22 mm) plus opening rotation, mostly + 2 mm (see page 27).

Fabrication with construction bite

1. First mark the outer surface of the four spacers with a flipchart/permanent pen. If necessary, apply twice.

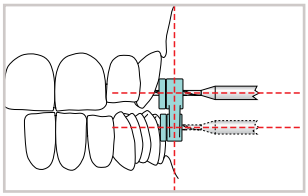
2. Cut the drilling shells off and put them in the measuring templates. The measuring template can be used with 23 or 25 mm length, also see hints.

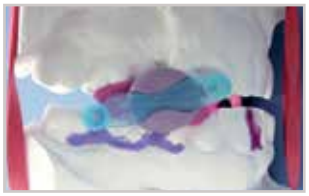
3. Articulate the models with a rubber band and with the cb removed from the sl-protrusion-gauge and cut to size.



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.



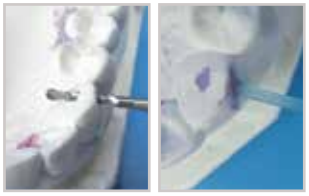


4. Fix the measuring template with Erkogum violet according to the drawings.
The lower pivot point results from the measurement (see hints).

5. 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).

6. 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.

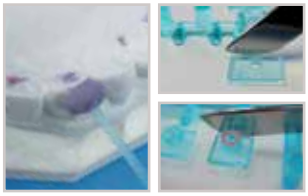
7. Remove spacer holding pin, measuring template and Erkogum, the models can now be separated.
Now put all 4 spacer holding pins into the drilling holes.



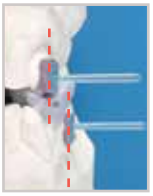
Hint for drilling: If the model has been drilled through, fix the spacer holding pin with Erkogum.
Fix chipped plaster pieces and the pin with quick-acting glue.

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

Cut the modelling pads and the spacers without excess length.

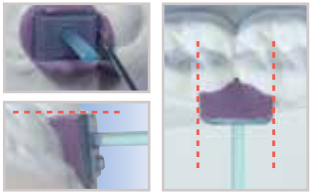


Small pad side shows towards the occlusal surface.



9. Push a modelling pad with the nep (yellow arrow) outwards as illustrated onto the spacer holding pin and press it on as near as possible.
Pay attention to a parallelism of the modelling pads.

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



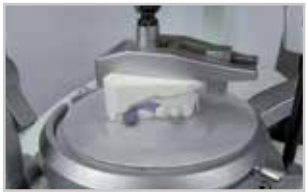
11. Now push a spacer on and engage it at the modelling pad (see circle).

12. Shorten the spacer holding pins.

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

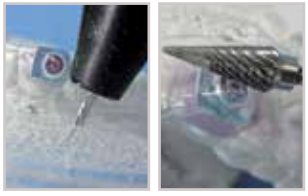
13. Remove construction bite and keep it. Lower the bite at the supporting pin to a gap of app. 2 mm between the front teeth.
Pull off the insulating foil of the Erkolen foil (1.0 mm) ...

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



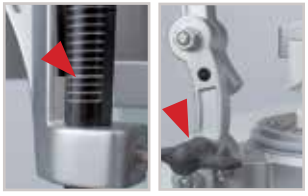
15. A plane occlusal surface is created to avoid a later opening rotation by the foil thickness (the Erkolen foil can be reused). (for alternative working steps until **24.** „sillicon key", see www.erkodent.com > Service > Video)

16. Take the models out of the device. Roughly cut out before removing the splint from the model (fissure bur >20 000 rev./min.). **Carefully** grind through the plate until the coloured marking on the spacers is just ...



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

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



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

20. 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.

21. 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.

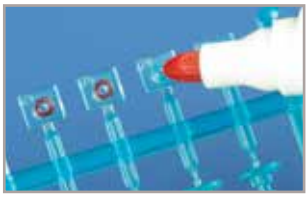
22. Now execute the second thermoforming step. As soon as the plate has been formed close the Occluform. Let the Occluform closed until the material has cooled down.

23. The occlusal conditions correspond now to the construction bite taken with the sl-protrusion-gauge.

... Continue at Finishing.

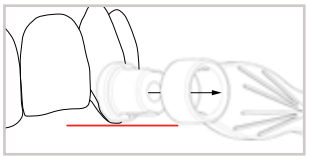
Fabrication without construction bite

1. First mark the outer surface of the four spacers with a flipchart/permanent pen. If necessary, apply twice.



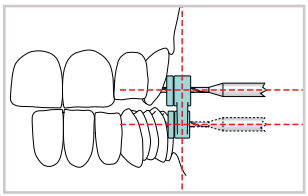
2. Cut the drilling shells off and put them in the measuring template. The measuring template can be used with 23 or 25 mm length, also see hints.

3. 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.



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

5. 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).

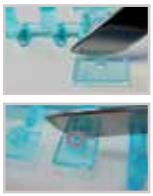
6. Before the hole in the lower jaw is drilled, put a spacer holding pin in the canine area through the drilling shell. Drill the lower jaw hole in the same manner.

7. 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.

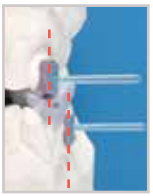
Hint for drilling: If the model has been drilled through, fix the spacer holding pin with Erkogum.
Fix chipped plaster pieces and the pin with quick-acting glue.

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

Cut the modelling pads and the spacers without excess length.



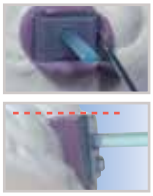
Small pad side shows towards the occlusal surface.

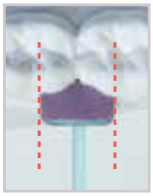


9. Push a modelling pad with the nep (yellow arrow) outwards as illustrated onto the spacer holding pin and press it on as near as possible. Pay attention to a parallelism of the modelling pads.

10. Remove excessive Erkogum with a knife.

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





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

12. Shorten the spacer holding pins.

Embed the models into the granules, leave the area below the spacer at least 6 mm free of granules. Thermoform the models one after the other. Immediately after the adaptation put ...

13. ... a 1 mm thick Erkolen foil without 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!**)

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

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

16. 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.)

17. Ensure a plane surface.

Now take the splint off the model.

... Continue at Finishing.

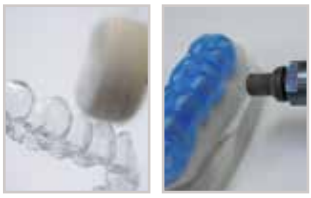
Finishing

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.).

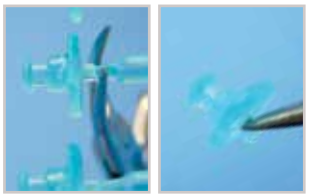
Smooth the borders, grinded areas with Lisko-S, narrow zones and interdental spaces with Liskoid (both 10 000 rev./min.).

3. Polish Erkodur with polishing agent for plastics (polishing set, 110 878). Erkoloc-pro can be „polished" with the hot air burner (177 540), only work on the model and do not heat the anchor holes (risk of deformation).



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

5. Remove the insulating/shrinkage compensation foil.

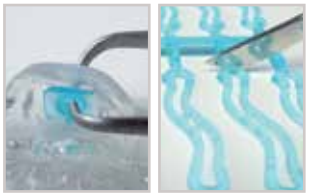


6. Cut the anchors as shown on the picture.

Take the anchors at the retaining lip and ...

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

Firmly press into position ...



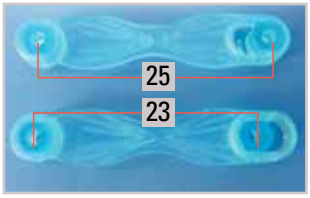
8. ... if necessary, also carefully with suitable pliers.

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

Choose the connector length:

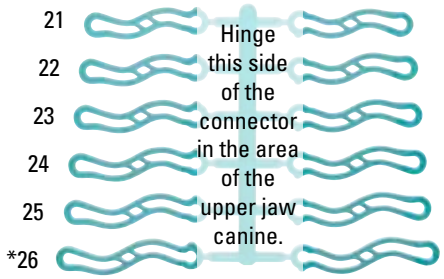
The connectors are exchangeable, for example if more protrusion is necessary for a sufficient effect.

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



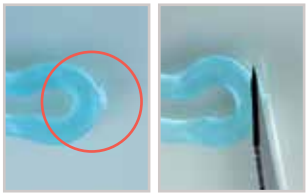
without cb:
measured, 23 / 25 mm
connector, 22 / 24 mm

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



*The 26 mm connector is used when the patient despite of bite taking does not tolerate the advancement.

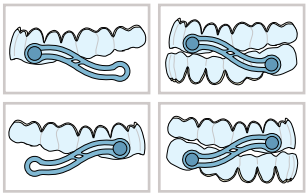
9. Remove sharp cutting edges!



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

Observe upper jaw canine side of the connector.

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



11. Hinge the connector into the other splint.
Please check correct positioning of the splint. In case of propulsion movements (feed) the connector shall slide out of the anchor of the ...

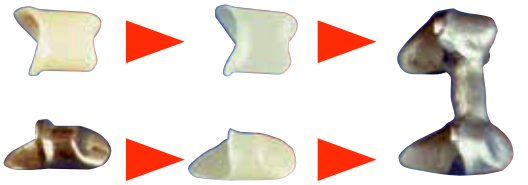
12. ... lower jaw, see picture, if not, hinge the connector about-face.

13. Now cut the retaining lips off from the anchor. Finished.

USIG friction-generating coping

Thermoformed plastic friction-generating coping out of special plastic for the telescope and attachment technique:

Placement of the Usig friction-generating coping:



Materials & Accessories

Fabrication:
- Usig-foils, 20 pieces, (650 005), Ø 120 mm, thickness 0.5 mm
- Usig-glue, 5 g, (650 010) • Usig-Primer, 5 ml, (650 025))
- Filling granules, fine, 1.3 kg, (110 861) • Erkoskin, 50 ml, (625 050)

Finishing:
- Usig-die disc (650 030) • HSS twist drill, 3 pieces, (110 876)
- Liskoid polishing discs, 6 pieces, (223 205)
- Usig-HM spherical bur, 1 piece, (650 015)
- Telescope crown pliers, 1 piece, (650 020)

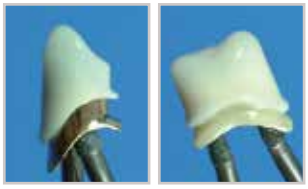
Important hints

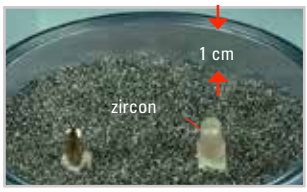
The required conditions for a good result are:
Milling angle 0 - 1°
- Per telescope at least 2 parallel surfaces (approximal 3 mm, lingual resp. palatinal 2 mm height).
- For even wall thicknesses of the friction-generating coping a vertical adaptation in the thermoforming unit is required.
- If the Usig-foil is thermoformed without spacer foil the friction is considerably increased. In case of more than 5 pillars, very long primary crowns, loose pillars and implants the foil should be thermoformed together with the spacer foil.
- The Usig-foil bonds to denture resin, Resilit-S 817 501 liquid, 817 502 powder rose (for ex. for replacement / travel dentures).
- Do not steam the friction-generating copings or expose to other heat (if so, only with inserted primary crown or filled with kneadable silicone).
- To avoid wrinkles in the foil the model pot must only be filled up to 1 cm below the edge with granulate (1.), work with the Usig-die disc and place the discs correctly (avoid center).

Instructions: (exemplary representation of the fabrication)

Thermoforming of the friction-generating copings:

Same way of fabrication of Usig friction-generating copings on primary crowns out of metal or zircon.



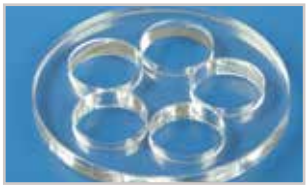


1. Place primary crowns as illustrated and align vertically ...

... below the primary crown edge keep app. 3 mm free from granules.

Without Usig-die disc use fine granules (110 861).

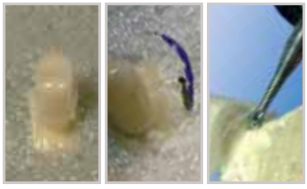
The Usig-die disc (650 030) provides for a better fixation of the dies in standard or fine granules ...



... more even wall thicknesses and less wrinkling are the results.

2. Thermoform the Usig-foil with the isolation foil showing towards the primary parts.

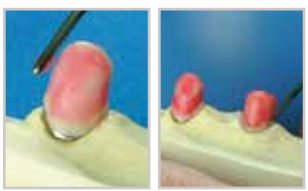
3. Cut out the coping area with the HSS twist drill (110 876) and below the preparation area with the spherical bur.

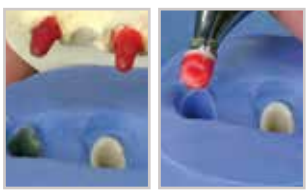


4. Finish the edges with Liskoid (223 205).

Duplication of the primary parts with Usig friction-generating copings for the classical fabrication of the tertiary structure.

5. Wax-up a thin layer (app. 0.2 mm) as spacer onto the copings for the later needed glue.
(Do not use Erkoskin, bonds to the duplicating compound.)





6. Duplicate (for ex. with Secosil, 411 100). Take off the primary parts with the copings.
Fabricate the tertiary structure in common manner on the duplicate.

Fabrication of the tertiary structure with Erkoskin and modelling resin

7. Apply a single layer of Erkoskin (625 050) on the coping and after complete hardening (app. 5 min.) ...

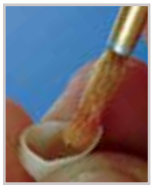
8. ... apply modelling resin.


9. To take it off the coping work incisally or occlusally a whole into resin. Remove Erkoskin and grind the modelling resin coping thin ...
Fabricate the tertiary structure in the usual way.

Glueing of the Usig friction-generating copings into the tertiary structure.

10. Insulate the Usig copings at the inside with Vaseline and put them on the primary crowns.

11. Cut glue exit slots into the tertiary structure.




12. Apply primer (650 025) at the inside of the tertiary structure (650 025), allow to well flash off.

13. Apply primer at the outside of the friction-generating copings. It should still be humid when glueing.


Usig-Primer:
Application: Sandblast the telescope inner surfaces with aluminium oxide (50 µm, 2 bar) and blow out with oil-free compressed-air, allow to completely dry. Generously apply Usig-Primer with a brush and allow to flash off for app. **1 min**.

Storage: The material should be stored at **5 - 25 °C**. Close the bottle properly immediately after use and protect against the effects of direct light. Durability, see label.

14. Fill a little Usig-glue (650 010) into the tertiary structure using the mixing tip.

Usig-glue to glue the Usig friction-generating coping in the tertiary part. There has to be a slot (0.2 mm) for the glue. This slot guarantees a tension-free fit and will be filled by the glue.

Application: Put on the mixing cannula and press out the needed quantity, the mixing cannula shall remain onto the syringe as a closure after use. When mixing by hand the two components must not get into contact with each other in the outlet area.

Working time from starting mixing: app. **3 min.** (also when handmixing with a spatula).

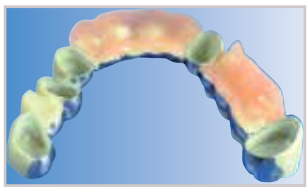
Beginning of setting: after app. **4:30 min.** • **Finish of setting**: after app. **8 min.**
The indications are valid at a room temperature of **22 °C**. Higher temperatures accelerate, lower temperatures decelerate the setting.
The object must not be moved from the beginning of the setting until it is hardened.
Storage in a refrigerator at **2 - 10 °C** ensures a durability of 2 years.

15. Press the tertiary structure onto the primary parts where the Usig copings are positioned.

16. Remove residual glue.

The primary crowns can be taken off with the telescope crown pliers.

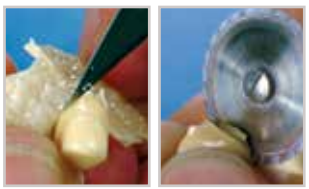

17. Finished patient case with Usig friction-generating copings glued in. **Do not steam the copings.** If necessary, clean with alcohol.



Restoration of the friction

18. For a later restoration of the friction produce a duplicate of the primary situation in the mouth and single dies.

19. Thermoform as described in point 1 and 2.

20. Finish the copings as shown in point 3 and 4. The copings can also be cut out with the scalpel.
Separate the plaster die.

21. Remove plaster with plaster removing agent.


22. Take the old copings off and glue the new copings in as described in point 10 to 15 without glue exit slot.

Trouble-shooting

mistake	possible reason	possible elimination
incomplete adaptation: (clear fizzling and blowing noise)	• sharp-edged model	• remove sharp edges at the model
	• selected foil is too thin for the model height, foil thins out too much	• per cm model height there is a loss in thickness of up to 25 %, choose thicker foils
	• hole in the foil in the area of the granules	• well condense granules
	• foil has been overheated	• does foil thickness comply with heating time/ temperature (only units with electric control)?
	• foreign particles in the area of the sealing or defect sealing	• take care that the area of the sealings is clean before thermoforming, if necessary, change sealing
incomplete adaptation: (no noticeable noise)	• defect cylinder, only pressure units (seldom)	• have the unit repaired by an authorised shop
	• foil not hot enough	• does foil thickness comply with heating time/ temperature (only units with electric control)?
	• heating element partially defect (unequal glowing), too old (foil temperature is not reached)	• have the heating element replaced by an authorised shop
	• airtight model	• use model out of hard plaster (class 3)
	• insufficient vacuum	• have the unit checked by an authorised shop
	• insufficient pressure (only pressure units)	• check pressure air supply cable (break), adjust manometer on factory setting, 4.5 bar power supply has to be at least 5 bar • have the unit checked by an authorised shop
bubbles in the foil:	• foil overheated	• does foil thickness comply with heating time/ temperature (only units with electric control)? • clean sensor window • interrupt preheating time after 30 sec. when the unit is very hot (Erkoform-RVE, Erkopress ES-200 E)
	• too much humidity in the thermoforming material, the steam that arises during heating cannot evaporate in time	• predry thermoforming material in a drying cupboard or a baking oven, see below
creases in the foil:	• foil overheated	• does foil thickness comply with heating time/ temperature (only units with electric control)? • clean sensor window • interrupt preheating time after 30 sec. when the unit is very hot (Erkoform-RVE, Erkopress ES-200 E)
unfavourable spreading of the foil thickness:	• not enough distance to the edge of the model pot or between the dies (copings)	• place model as far as possible in the middle • use die model disc
	• model too high	• trim models more flat or embed into the granules
	• model has not been embedded in an inclined way	• incline model: thicker material desired labially lower model distally, thicker material desired on the palatinal/lingual side, lift model distally

Predrying:	**Erkodur:**	**Erkoloc-pro:**	**Erkocryl:**	**Erkodur-C:**
	0.5 - 2.0 mm, 5 hrs., 60 °C 3.0 - 5.0 mm, 8 hrs., 60 °C	1.0 - 5.0 mm, 48 hrs., 60 °C	1.5 mm, 3 hrs., 90 °C 2.0 mm, 5 hrs., 90 °C 2.5 mm, 7 hrs., 90 °C	0.5/0.6 mm, 40 min., 80 °C 0.8 mm, 50 min., 80 °C 1.0 mm, 60 min., 80 °C

Selection of the right material thickness

To select the right material thickness it has to be taken into consideration that the thermoforming material looses 20 - 25 % of its original thickness when forming a model area of 1 cm height, for 2 cm height the loss is 30 - 40 %. For occlusal splints the thickness is selected according to the desired verticalisation that possibly still allows a grinding-in without additional adjustment.

Plastification

in units without time or temperature control.

- For the most materials please proceed as follows: Check softness with instrument. If permanent impressions result, thermoform.
- Erkolen, Erkoflex-bleach and Erkoflex-95 become clear upon heating, then thermoform. Heat Erkoflex and Erkodur-C until the foil sags app. 2 cm, afterwards thermoform.

Please also pay attention to the indications in the respective operating instructions.

Biocompatibility • allergic reactions

All thermoforming materials are tested on their biocompatibility.
They correspond to the EC Directive 93/42/EEC (medical products class 1) with changes as per 2007/47/EC and are marked CE.
Up to now (2013) there are only two suspected cases of allergic reactions to the materials known, but allergic reactions cannot be excluded.

Instructions for cleaning and maintenance

The appliances (splints) fabricated out of thermoforming materials should be cleaned and maintained as follows:

- Best results are achieved with **Oxydens** cleansing tablets for dental splints (280 030, Oxydens Clean-set, 280 032, 32 cleansing tablets).
  Further cleaning agents: Soap, curd soap, liquid soap and dish-washers.
  Do not use any strongly perfumed soaps. Not suited are: tooth-paste (contains abrasive particles), mouth-wash (can cause discolouring) and water that is hotter than 50 °C (deformation). Solvent-based cleaning agents cause delamination of multi-layered splints.

After use:

- Well wash with water.
- Best is to thoroughly clean the inner and exterior side of the splint with a tooth brush and soap.
- Again well wash with water.
- Shake off the water or dry with a towel.
- Never blow-dry - deformation!
- Very important: Allow the splint to completely dry! Keep at a dry place, at best in a box like the Erkobox (215 030) or Splintbox (214 020) that has aeration holes.
- Again wash with water before using it.

Generation of bad smells

If after some time the splint has adopted a strong smell, additionally put the splint for one hour in a non-perfumed, concentrated soap solution, afterwards thoroughly wash with water. Such a soap sud removes most of the smell generating bacteries.

Discolouring

Soft thermoforming materials have the tendency to discolour. This intake of colour pigments can be reduced or avoided by a careful maintenance but it cannot be reversed. Mouth-washs and amalgam fillings can also cause discolouring.

Disinfection

With the exception of Erkoloc and Erkoloc-pro/***blu***/***green*** all thermoforming materials can be disinfected with disinfection alcohol and other commercial liquids. Erkoloc and Erkoloc-pro/***blu***/***green*** have to be stored for app. 5 hours at a dry place without any pressure on it after having contact with alcohol in order to ensure that the alcohol can evaporate completely. Otherwise a bonding of the hard and soft layer is no longer guaranteed.

Sterilisation

A sterilisation with gaz and plasma (< 50 °C) is possible. As a result of the thermolability the materials are not autoclavable.

Thermoforming materials

Thermoforming material		Colour	Material characteristics
Erkocryl	PMMA	clear or coloured	Stable, hard, acrylate based material. Bonds to acrylate (Resilit-S).
Erkodur **Erkodur *freeze***	PETG	clear turquoise-transp.	Resistant, hard-elastic material. Burns without residues. Bonds to acrylate (Resilit-S).
Erkodur-A1/-A3	PETG	tooth colour	Resistant, hard-elastic material. Burns without residues. Bonds to acrylate (Resilit-S).
Erkodur-C	CP	clear	Hard-elastic material. Burns without residues. Bonds to acrylate (Resilit-S).
Erkodur-S	SBS	clear	Hard-elastic material. Burns without residues. Bonds to acrylate (Resilit-S). Bonds with heat to Erkoflex.
Erkoflex	EVA	transparent or coloured	Rubbery, tough, soft-elastic material. Can be bonded by heating or a fusing gun with Erkoflexsticks-82. Hardness Shore A: 82
Erkoflex-95	EVA	transparent	Tough, soft-elastic material. Can be adjusted by heating or a fusing gun with Erkoflex-sticks-95 (not bonded). Hardness Shore A: 95
Erkoflex-bleach	EVA	transparent	Tough, soft-elastic material with good memory. Hardness Shore A: 95
Erkolen	PE	transparent	Soft material, burns without residues, low elastic memory.
Erkolign	PP	transparent	Extremely resistant, break-stable material. Slightly higher shrinkage, thermoform only with UZF-Plus 0.1 mm.
Erkoloc	SBS EVA	transparent	Double-layer plate hard/soft. Hard layer bonds to acrylate (Resilit-S). Allow to rest for app. 2 hours in order to ensure a stable bond. Not suitable for longterm therapy.
Erkoloc-pro **Erkoloc-pro *blu*/*green***	PETG TPU	transparent blu/green transp.	Double-layer plate hard/soft. Resistant material with high wearing comfort. Hard side bonds to acrylate (Resilit-S).
Erkoplast-O	PS	white-opaque	Impact resistant, very rigid material. LG-tray handles can be applied using the LG-Primer. Bonds to acrylate (Resilit-S).
Erkoplast	PS	pink	Impact resistant, rigid material. Bonds to acrylate (Resilit-S).
Erkorit	PS	clear	Impact resistant, very rigid material. LG-tray handles can be applied using the LG-Primer. Bonds to acrylate (Resilit-S).
Playsafe triple foil	EVA COC EVA	transparent or coloured	Triple-layer plate soft/hard/soft.
Usig-Foil	PETG	tooth colour, opaque	Abrasion-resistant, very tough material, antibacterially equipped. Glueable, bonds to acrylate.
UZF-Cast	PS PVC PS	red clear brown	Spacer foils (shrinkage compensation) for the casting technique, brown and red for Erkolen, clear for Erkodur-C, UZF-A for Erkomini.
UZF-Plus	PE	clear with imprint	UZF-Plus can be applied by one or two layers on each Erkodent foil as spacer/insulating foil. Also additionally (then only one layer) on spacer/insulating foils that are already applied ex works.

PE Insulating foil for insulating and shrinkage compensation

PLAY SAFE® Erkoflex-color

Thickness 2 mm, order number (contents)
(temperature and heating times see foil packaging)

Colour	Ø 120 mm	125x125 mm	Ø 125 mm
bright red	58 12 21 (5)	58 17 21 (5)	58 19 21 (5)
bright yellow	58 12 22 (5)	58 17 22 (5)	58 19 22 (5)
bright blue	58 12 23 (5)	58 17 23 (5)	58 19 23 (5)
bright green	58 12 24 (5)	58 17 24 (5)	58 19 24 (5)
bright pink	58 12 25 (5)	58 17 25 (5)	58 19 25 (5)
deep red	58 12 26 (5)	58 17 26 (5)	58 19 26 (5)
dark blue	58 12 27 (5)	58 17 27 (5)	58 19 27 (5)
light blue	58 12 28 (5)	58 17 28 (5)	58 19 28 (5)
maroon	58 12 31 (5)	58 17 31 (5)	58 19 31 (5)
deep green	58 12 32 (5)	58 17 32 (5)	58 19 32 (5)
pure white	58 12 33 (5)	58 17 33 (5)	58 19 33 (5)
deep black	58 12 34 (5)	58 17 34 (5)	58 19 34 (5)
gold	58 12 35 (5)	58 17 35 (5)	58 19 35 (5)
silver	58 12 36 (5)	58 17 36 (5)	58 19 36 (5)
Colour set, plain colours, 15 pieces (incl. transparent)			
	58 12 29 (15)	58 17 29 (15)	58 19 29 (15)

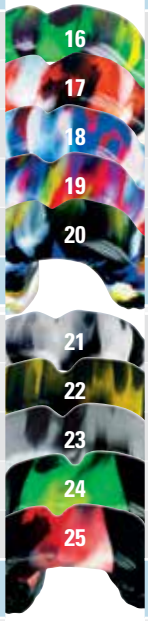
Thickness 4 mm, order number (contents)
(temperature and heating times see foil packaging)

Colour	Ø 120 mm	125x125 mm	Ø 125 mm
bright red	58 12 41 (5)	58 17 41 (5)	58 19 41 (5)
bright yellow	58 12 42 (5)	58 17 42 (5)	58 19 42 (5)
bright blue	58 12 43 (5)	58 17 43 (5)	58 19 43 (5)
bright green	58 12 44 (5)	58 17 44 (5)	58 19 44 (5)
bright pink	58 12 45 (5)	58 17 45 (5)	58 19 45 (5)
deep red	58 12 46 (5)	58 17 46 (5)	58 19 46 (5)
dark blue	58 12 47 (5)	58 17 47 (5)	58 19 47 (5)
light blue	58 12 48 (5)	58 17 48 (5)	58 19 48 (5)
maroon	58 12 51 (5)	58 17 51 (5)	58 19 51 (5)
deep green	58 12 52 (5)	58 17 52 (5)	58 19 52 (5)
pure white	58 12 53 (5)	58 17 53 (5)	58 19 53 (5)
deep black	58 12 54 (5)	58 17 54 (5)	58 19 54 (5)
gold	58 12 55 (5)	58 17 55 (5)	58 19 55 (5)
silver	58 12 56 (5)	58 17 56 (5)	58 19 56 (5)
Colour set, plain colours, 15 pieces (incl. transparent)			
	58 12 49 (15)	58 17 49 (15)	58 19 49 (15)

Freestyle colours
Thickness 2 mm, order number (contents)
(temperature and heating times see foil packaging)

Colour	Ø 120 mm	125x125 mm	Ø 125 mm
camouflage	58 12 60 (5)	58 17 60 (5)	58 19 60 (5)
lava	58 12 61 (5)	58 17 61 (5)	58 19 61 (5)
tie-dye	58 12 62 (5)	58 17 62 (5)	58 19 62 (5)
rainbow	58 12 63 (5)	58 17 63 (5)	58 19 63 (5)
confetti	58 12 64 (5)	58 17 64 (5)	58 19 64 (5)
Freestyle Set**	58 12 69 (5)	58 17 69 (5)	58 19 69 (5)
zebra	58 12 65 (5)	58 17 65 (5)	58 19 65 (5)
goldflakes	58 12 66 (5)	58 17 66 (5)	58 19 66 (5)
silverflakes	58 12 67 (5)	58 17 67 (5)	58 19 67 (5)
camouflagestrip	58 12 68 (5)	58 17 68 (5)	58 19 68 (5)
lavastrip	58 12 70 (5)	58 17 70 (5)	58 19 70 (5)
Freestyle-blackline Set**	58 12 79 (5)	58 17 79 (5)	58 19 79 (5)

* Order numbers for Erkoflex transparent, see list next page



Freestyle colours
Thickness 4 mm, order number (contents)
(temperature and heating times see foil packaging)

Colour	Ø 120 mm	125x125 mm	Ø 125 mm
camouflage	58 12 80 (5)	58 17 80 (5)	58 19 80 (5)
lava	58 12 81 (5)	58 17 81 (5)	58 19 81 (5)
tie-dye	58 12 82 (5)	58 17 82 (5)	58 19 82 (5)
rainbow	58 12 83 (5)	58 17 83 (5)	58 19 83 (5)
confetti	58 12 84 (5)	58 17 84 (5)	58 19 84 (5)
Freestyle Set**	58 12 89 (5)	58 17 89 (5)	58 19 89 (5)
zebra	58 12 85 (5)	58 17 85 (5)	58 19 85 (5)
goldflakes	58 12 86 (5)	58 17 86 (5)	58 19 86 (5)
silverflakes	58 12 87 (5)	58 17 87 (5)	58 19 87 (5)
camouflagestrip	58 12 88 (5)	58 17 88 (5)	58 19 88 (5)
lavastrip	58 12 90 (5)	58 17 90 (5)	58 19 90 (5)
Freestyle-blackline Set**	58 12 99 (5)	58 17 99 (5)	58 19 99 (5)

** Freestyle set und freestyle-blackline set (assorted, 5 pcs)

PLAY SAFE® triple

Thickness 5.5 mm, Erkoflex 3.0 mm (soft), triple layer 1.0 mm (hard), Erkoflex 1.5 mm (soft)
(temperature and heating time see foil packaging)

Playsafe triple start set, Ø 120 mm, 177 810: 1 Playsafe triple set with transparent foil, 1 Playsafe bite spacer, 1 Playsafe face chuck

Playsafe triple set, Ø 120 mm, 1 Playsafe triple foil (colour has to be indicated), 1 label, 1 Erkobox, 1 sample FG-sheet, instructions

177 820 single coloured (1 - 15)	**177 823** four-coloured (1 - 15)
177 821 two-coloured (1 - 15)	**177 824** freestyle (16 - 23)
177 822 three-coloured (1 - 15)	**177 819** freestyle strip (24 + 25)

Playsafe triple foils, Ø 120 mm, 5 triple foils of the same colour (colour has to be indicated), 5 labels, 1 sample FG-sheet, instr.

177 825 single coloured (1 - 15)	**177 828** four-coloured (1 - 15)
177 826 two-coloured (1 - 15)	**177 829** freestyle (16 - 23)
177 827 three-coloured (1 - 15)	**177 830** freestyle strip (24 + 25)

Material	Ft	Tft	Ht	Order number (Contents)	Order number (Contents)	Order number (Contents)
	mm	°C	min	Ø 120 mm	125 x 125 mm	Ø 125 mm
Erkocryl clear	1.50	195	1.55	57 12 15 (10) • 57 42 15 (50)		
	2.00	195	2.20	57 12 20 (10) • 57 42 20 (50)		
	2.50	195	2.55	57 12 25 (10) • 57 42 25 (50)		
Erkodur clear, with insulating foil	0.50	160	0.35	52 12 05 (20) • 52 42 05 (100)	52 14 05 (20) • 52 44 05 (100)	52 15 05 (20) • 52 45 05 (100)
	0.60	160	0.40	52 12 06 (20) • 52 42 06 (100)	52 14 06 (20) • 52 44 06 (100)	52 15 06 (20) • 52 45 06 (100)
	0.80	160	0.45	52 12 08 (20) • 52 42 08 (100)	52 14 08 (20) • 52 44 08 (100)	52 15 08 (20) • 52 45 08 (100)
	1.00	160	0.50	52 12 10 (20) • 52 42 10 (100)	52 14 10 (20) • 52 44 10 (100)	52 15 10 (20) • 52 45 10 (100)
	1.50	160	1.05	52 12 15 (10) • 52 42 15 (50)	52 14 15 (10) • 52 44 15 (50)	52 15 15 (10) • 52 45 15 (50)
	2.00	155	1.25	52 12 20 (10) • 52 42 20 (50)	52 14 20 (10) • 52 44 20 (50)	52 15 20 (10) • 52 45 20 (50)
	3.00	155	2.05	52 12 30 (10) • 52 42 30 (50)	52 14 30 (10) • 52 44 30 (50)	52 15 30 (10) • 52 45 30 (50)
	4.00	155	2.40	52 12 40 (10) • 52 42 40 (50)		52 15 40 (10) • 52 45 40 (50)
	5.00	155	3.40	52 12 50 (10) • 52 42 50 (50)		
Erkodur ***freeze*** turquoise-transparent, with insulating foil	1.00	160	0.50	52 91 10 (20) • 52 94 10 (100)	52 86 10 (20) • 52 88 10 (100)	52 75 10 (20) • 52 76 10 (100)
	1.50	160	1.05	52 91 15 (10) • 52 94 15 (50)	52 86 15 (10) • 52 88 15 (50)	52 75 15 (10) • 52 76 15 (50)
	2.00	155	1.25	52 91 20 (10) • 52 94 20 (50)	52 86 20 (10) • 52 88 20 (50)	52 75 20 (10) • 52 76 20 (50)
	3.00	155	2.05	52 91 30 (10) • 52 94 30 (50)	52 86 30 (10) • 52 88 30 (50)	52 75 30 (10) • 52 76 30 (50)
Erkodur-A1 tooth-colour, with insulating foil	0.60	170	0.40	52 22 06 (20)	52 24 06 (20)	52 19 06 (20)
	1.00	165	0.50	52 22 10 (20)	52 24 10 (20)	52 19 10 (20)
	2.00	155	1.25	52 22 20 (10)	52 24 20 (10)	52 19 20 (10)
Erkodur-A3 tooth-colour, with insulating foil	0.60	170	0.40	52 62 06 (20)	52 69 06 (20)	52 65 06 (20)
	1.00	165	0.50	52 62 10 (20)	52 69 10 (20)	52 65 10 (20)
	2.00	155	1.25	52 62 20 (10)	52 69 20 (10)	52 65 20 (10)
Erkodur-C clear	0.50	170	0.45	52 52 05 (20) • 52 82 05 (100)		
	0.60	170	0.50	52 52 06 (20) • 52 82 06 (100)	52 54 06 (20) • 52 84 06 (100)	52 55 06 (20) • 52 85 06 (100)
	0.80	170	1.00	52 52 08 (20) • 52 82 08 (100)		
	1.00	170	1.10	52 52 10 (20) • 52 82 10 (100)		
Erkodur-S clear	0.80	160	0.40	52 13 08 (20)	52 18 08 (20)	52 29 08 (20)
Erkoflex transparent, with insulating foil	1.00	130	0.40	58 12 10 (20) • 58 42 10 (100)	58 17 10 (20) • 58 47 10 (100)	58 19 10 (20) • 58 49 10 (100)
	1.50	130	0.55	58 12 15 (10) • 58 42 15 (50)	58 17 15 (10) • 58 47 15 (50)	58 19 15 (10) • 58 49 15 (50)
	2.00	130	1.25	58 12 20 (10) • 58 42 20 (50)	58 17 20 (10) • 58 47 20 (50)	58 19 20 (10) • 58 49 20 (50)
Temperature and time indication for Erkoflex **without** insulating foil, see instructions	3.00	130	2.25	58 12 30 (10) • 58 42 30 (50)	58 17 30 (10) • 58 47 30 (50)	58 19 30 (10) • 58 49 30 (50)
	4.00	120	3.05	58 12 40 (10) • 58 42 40 (50)	58 17 40 (10) • 58 47 40 (50)	58 19 40 (10) • 58 49 40 (50)
	5.00	120	3.30	58 12 50 (10) • 58 42 50 (50)	58 17 50 (10) • 58 47 50 (50)	58 19 50 (10) • 58 49 50 (50)
Erkoflex-95 transparent, with insulating foil	1.50	155	1.15	58 92 15 (10) • 58 94 15 (50)	58 69 15 (10) • 58 67 15 (50)	58 59 15 (10) • 58 54 15 (50)
	2.50	140	1.55	58 92 25 (10) • 58 94 25 (50)	58 69 25 (10) • 58 67 25 (50)	58 59 25 (10) • 58 54 25 (50)
	4.00	130	2.45	58 92 40 (10) • 58 94 40 (50)	58 69 40 (10) • 58 67 40 (50)	58 59 40 (10) • 58 54 40 (50)
Erkoflex-bleach transp., with insul. f.	1.00	175	0.55	58 13 10 (20) • 58 43 10 (100)	58 18 10 (20) • 58 48 10 (100)	58 15 10 (20) • 58 45 10 (100)
Erkolen transparent, with insulating foil	0.50	175	0.35	51 12 05 (20) • 51 42 05 (100)	51 13 05 (20) • 51 43 05 (100)	51 15 05 (20) • 51 45 05 (100)
	0.60	175	0.40	51 12 06 (20) • 51 42 06 (100)	51 13 06 (20) • 51 43 06 (100)	51 15 06 (20) • 51 45 06 (100)
	0.70	170	0.45	51 12 07 (20) • 51 42 07 (100)	51 13 07 (20) • 51 43 07 (100)	51 15 07 (20) • 51 45 07 (100)
	0.80	170	0.55	51 12 08 (20) • 51 42 08 (100)	51 13 08 (20) • 51 43 08 (100)	
	1.00	165	1.00	51 12 10 (20) • 51 42 10 (100)	51 13 10 (20) • 51 43 10 (100)	51 15 10 (20) • 51 45 10 (100)
	1.50	160	1.35	51 12 15 (10) • 51 42 15 (50)	51 13 15 (10) • 51 43 15 (50)	
	2.00	150	2.05	51 12 20 (10) • 51 42 20 (50)	51 13 20 (10) • 51 43 20 (50)	51 15 20 (10) • 51 45 20 (50)
	3.00	140	2.55	51 12 30 (10) • 51 42 30 (50)	51 13 30 (10) • 51 43 30 (50)	
Erkolign transparent, with insulating foil	1.00	200	1.50	54 12 10 (20) • 54 42 10 (100)		54 15 10 (20) • 54 45 10 (100)
	2.00	200	2.40	54 12 20 (10) • 54 42 20 (50)		54 15 20 (10) • 54 45 20 (50)
Erkoloc transparent, with insulating foil	1.80	135	1.20	59 12 18 (10) • 59 42 18 (50)	59 18 18 (10) • 59 48 18 (50)	59 15 18 (10) • 59 45 18 (50)
	3.00	120	2.05	59 12 30 (10) • 59 42 30 (50)	59 18 30 (10) • 59 48 30 (50)	59 15 30 (10) • 59 45 30 (50)
Erkoloc-pro transparent, with insulating foil	1.00	160	1.00	59 51 10 (20) • 59 54 10 (100)	59 52 10 (20)	59 55 10 (20)
	1.30	160	1.10	59 51 13 (20) • 59 54 13 (100)	59 52 13 (20)	59 55 13 (20)
	2.00	170	1.55	59 51 20 (10) • 59 54 20 (50)	59 52 20 (10)	59 55 20 (10)
	3.00	165	2.40	59 51 30 (10) • 59 54 30 (50)	59 52 30 (10)	59 55 30 (10)
	4.00	160	3.25	59 51 40 (10) • 59 54 40 (50)		59 55 40 (10)
	5.00	160	4.30	59 51 50 (10) • 59 54 50 (50)		59 55 50 (10)

Material	Ft	Tft	Ht	Order number (Contents)	Order number (Contents)	Order number (Contents)
	mm	°C	min	Ø 120 mm	125 x 125 mm	Ø 125 mm
Erkoloc-pro *blu* blue-transparent, with insulating foil	**2.00**	170	1.55	59 56 20 (10) • 59 58 20 (50)	59 76 20 (10)	59 66 20 (10)
	3.00	165	2.40	59 56 30 (10) • 59 58 30 (50)	59 76 30 (10)	59 66 30 (10)
	4.00	160	3.25	59 56 40 (10) • 59 58 40 (50)		59 66 40 (10)
	5.00	160	4.30	59 56 50 (10) • 59 58 50 (50)		59 66 50 (10)
Erkoloc-pro *green* green-transparent, with insulating foil	**2.00**	170	1.55	59 72 20 (10) • 59 74 20 (50)	59 65 20 (10)	59 82 20 (10)
	3.00	165	2.40	59 72 30 (10) • 59 74 30 (50)	59 65 30 (10)	59 82 30 (10)
	4.00	160	3.25	59 72 40 (10) • 59 74 40 (50)		59 82 40 (10)
	5.00	160	4.30	59 72 50 (10) • 59 74 50 (50)		59 82 50 (10)
Erkoplast-O white-opaque	**1.50**	165	1.25	55 15 15 (10) • 55 45 15 (50)	55 28 15 (10) • 55 48 15 (50)	55 19 15 (10) • 55 49 15 (50)
	2.50	150	1.45	55 15 25 (10) • 55 45 25 (50)	55 28 25 (10) • 55 48 25 (50)	55 19 25 (10) • 55 49 25 (50)
	3.00	150	2.05	55 15 30 (10) • 55 45 30 (50)	55 28 30 (10) • 55 48 30 (50)	55 19 30 (10) • 55 49 30 (50)
	4.00	150	3.00	55 15 40 (10) • 55 45 40 (50)	55 28 40 (10) • 55 48 40 (50)	55 19 40 (10) • 55 49 40 (50)
Erkoplast-R pink	**1.50**	165	1.15	55 12 15 (10) • 55 42 15 (50)	55 14 15 (10) • 55 44 15 (50)	
	2.50	150	1.35	55 12 25 (10) • 55 42 25 (50)	55 14 25 (10) • 55 44 25 (50)	
	3.00	150	1.55	55 12 30 (10) • 55 42 30 (50)	55 14 30 (10) • 55 44 30 (50)	
	4.00	150	2.50	55 12 40 (10) • 55 42 40 (50)	55 14 40 (10) • 55 44 40 (50)	
Erkorit clear	**2.50**	165	1.45	56 12 25 (10) • 56 42 25 (50)	56 14 25 (10) • 56 44 25 (50)	56 15 25 (10) • 56 45 25 (50)
	3.50	160	2.35	56 12 35 (10) • 56 42 35 (50)	56 14 35 (10) • 56 44 35 (50)	56 15 35 (10) • 56 45 35 (50)
Usig-Foil tooth colour-opaque w. i. f.	**0.50**	160	0.30	65 00 05 (20)		
UZF-Cast red, for Erkolen	**0.10**			53 11 01 (100)		53 25 01 (100)
clear, for Erkodur-C	**0.10**			53 11 11 (100)		
brown, for Erkolen	**0.15**			53 11 15 (100)		
UZF-Cast, spacer foil for the casting technique						
UZF-Plus clear with logo	**0.10**			53 12 01 (50)		

UZF-Plus on red carrier foil, can be applied by one or two layers as spacer/insulating foil on each Erkodent foil. Also additionally (by one layer) on already ex works applied spacer/insulating foils.

Material	Ft	Order number (Contents)
	mm	Ø 70 mm
Erkodur clear, with insulating foil	**0.50**	52 67 05 (20) • 52 47 05 (100)
	0.60	52 67 06 (20) • 52 47 06 (100)
	0.80	52 67 08 (20) • 52 47 08 (100)
Erkodur-C clear	**0.50**	52 70 05 (20) • 52 74 05 (100)
	0.60	52 70 06 (20) • 52 74 06 (100)
	0.80	52 70 08 (20) • 52 74 08 (100)
Erkolen clear	**0.50**	51 67 05 (20) • 51 47 05 (100)
	0.60	51 67 06 (20) • 51 47 06 (100)
	0.70	51 67 07 (20) • 51 47 07 (100)
	0.80	51 67 08 (20) • 51 47 08 (100)
	1.00	51 67 10 (20) • 51 47 10 (100)
UZF-Cast red, for Erkolen	**0.10**	53 17 01 (100)
clear, for Erkodur-C	**0.10**	53 17 11 (100)
brown, for Erkolen	**0.15**	53 17 15 (100)

Material	Ft	Order number (Contents)
	mm	Ø 120 mm
Erkocryl rose	**2.00**	57 22 20 (10)
Coloured Erkocryl on request	2.00	

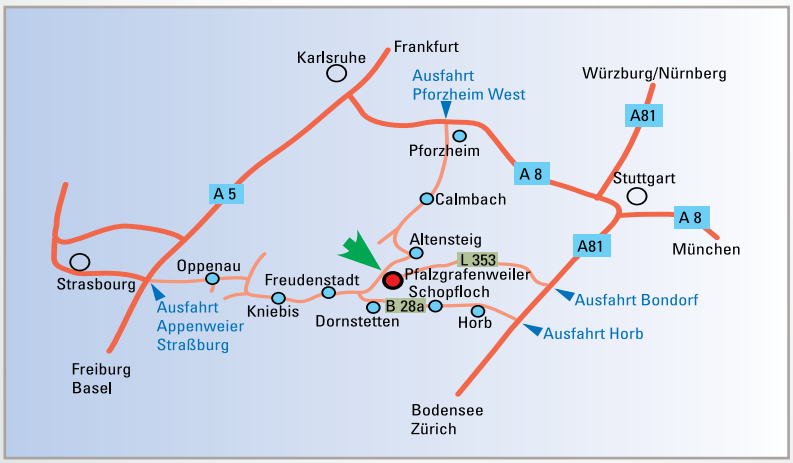
For **Erkomini, 182 200** (manual coping production)	Ft	Order number (Contents)
Material	mm	Ø 42 mm
Erkolen-A transparent (harder than **Erkolen**)	**0.60**	51 14 66 (100) • 51 24 66 (500)
Erkolen-AW transparent (like **Erkolen**)	**0.60**	51 14 06 (100) • 51 24 06 (500)
UZF-A clear	**0.10**	53 14 01 (200) • 53 24 01 (500)
Shrinkage compensation foil for ERKOLEN-A and -AW		

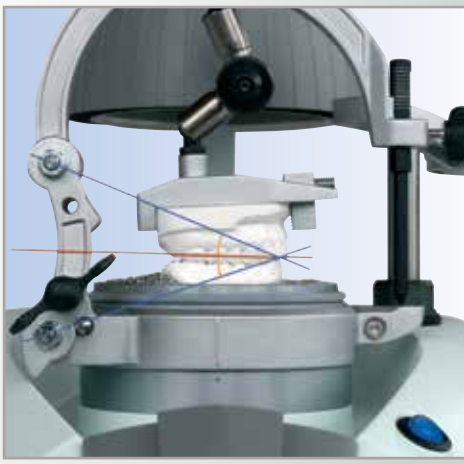
Ft **Ft = Foil thickness (mm)**

Tft **Tft = Thermoforming temperature (°C),** only for Erkodent units with temperature sensor

Ht **Ht = Heating time (min.sec.),** only for Erkodent units with programmable heating time

English





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