



# DUNAFORM PLUS

Pressure thermo-forming unit for foils Ø 120 mm and Ø 125 mm

Operating Instructions

CONTENTS	PAGE
<b>1. GENERAL</b>	<b>3</b>
1.1 This operation manual allows a safe and efficient handling of this unit	3
1.2 Limits of liability	3
1.3 Copyright protection	3
1.4 Spare parts	3
1.5 Warranty regulations	3
1.6 After-sales service	3
1.7 Disposal	3
<b>2. SAFETY</b>	<b>3 - 4</b>
2.1 The operator's responsibility	3
2.2 Appropriate use	3
2.3 Temperature monitoring	4
2.4 Extraneous Hazards	4
2.41 Electrical Shock Hazard	4
2.42 Caution! Hot surfaces!	4
<b>3. DELIVERY CONTENTS</b>	<b>4</b>
<b>4. INCOMING CONTROL</b>	<b>5</b>
<b>5. TECHNICAL DATA</b>	<b>5</b>
<b>6. INSTALLATION</b>	<b>5</b>
6.1 Initiation of the DUNAFORM	5
6.2 Mains supply	5
6.3 Compressed air connection	5
<b>7. OPERATING ELEMENTS</b>	<b>5 - 6</b>
<b>8. BASIC SETTINGS MENU</b>	<b>6- 11</b>
8.1 Selection of language	6
8.2 Adjusting working pressure	7
8.3 Signal ON/OFF	7
8.4 Adjusting / setting of various foils	8- 11
8.4.1 Foils/sheets, brand, al dente Dentalprodukte, 6 types	8- 10
8.4.2 Foils/sheets, individual brands, 10 types	10- 11
<b>9. RELEVANT INFORMATION FOR OPERATING THE UNIT</b>	<b>12 - 14</b>
<b>10. EXCHANGE OF FUSES</b>	<b>15</b>
<b>11. TROUBLE SHOOTING</b>	<b>15</b>
<b>12. HEATING TIME AND COOLING PERIOD</b>	<b>16</b>
12.1 Foils/sheets, brand: al dente dentalprodukte GmbH (recommendation)	16
12.2 Foil types of other manufacturers (recommendation: when using other products the heating /Cooling times may vary	16
<b>13. MENU SEQUENCE</b>	<b>17 - 21</b>
<b>14. DECLARATION OF CONFORMITY</b>	<b>22</b>

## 1. GENERAL

### 1.1 This operation manual allows a safe and efficient handling of this unit

The operation manual is part of the unit and has to be in close proximity of the unit and always accessible for the staff members. The staff members have to read and understand this manual before starting any work with this unit. The basis for safe working is the strict observance of all mentioned safety information and directions in this manual. Beyond that the local accident prevention regulations and general safety regulations for the application field of the unit are in force.

### 1.2 Limits of liability

The manufacturer does not assume any liability for damages due to

- Disregard of the operation manual
- Inappropriate use
- Employment of unskilled staff members
- Unauthorized conversion of the unit
- Technical modifications
- Use of non-licensed spare parts

The contractual commitments based on the delivery contract, the general terms and conditions, the delivery conditions of the manufacturer as well as the legal requirements valid at the date of the contract's conclusion are valid. Technical alterations due to improvement and further development are subject to modifications.

### 1.3 Copyright protection

This operation manual is copyright reserved and exclusively bound for internal purposes. Transferring this manual for use to third parties, duplication in any way and manner – even in extracts – as well as use and/or transfer of the content are prohibited without the manufacturer's permission in written except for internal use. Contraventions oblige for compensation. Further claims reserved.

### 1.4 Spare parts

False or faulty spare parts can affect safety and lead to damages, hazardous malfunctions or complete failure.

- Only use original spare parts of the manufacturer. Loss of any warranty/guarantee when using external parts that are not provided by your dealer – that are not coming from the original manufacturer. Provide spare parts through your dealer.

### 1.5 Warranty regulations

The relevant legal regulations are valid.

### 1.6 After-sales service

If you need further technical details, please do not hesitate to contact your distributor.

Moreover our staff members are always interested in new information and experiences resulting from using this unit and which may be valuable for improving our products.

### 1.7 Disposal

For a proper disposal the national regulations are valid. You may also contact your dealer.

## 2. SAFETY

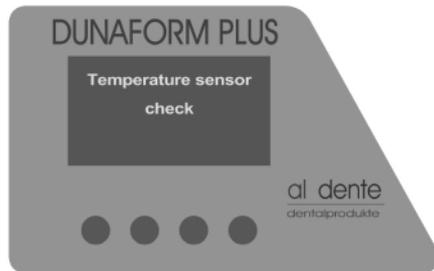
### 2.1 The operator's responsibility

The unit is exclusively used in the commercial field. Due to this fact the operator of the unit is subject to the legal obligations for safety at work. The operator has to make sure that all staff members using this unit have read and understood the operation manual. The unit needs to be used by trained and qualified personnel only.

### 2.2 Appropriate use

The unit is exclusively designed and constructed for the use herein described: Pressure thermo-forming unit for all applications in dental thermo-forming techniques used in dental technology and dentistry.

## 2.3 Temperature monitoring



A temperature sensor is monitoring the unit.

If - after switching on the unit – the display (4) starts flashing, "Temperature sensor check" is indicated and an alarm sounds:

**Turn off the unit's power switch (10) – see page 6.**

**Request for service by a service technician.**

## 2.4 Extraneous Hazards

The herein mentioned safety notes as well as the warning notes mentioned in further chapters of this manual have to be observed in order to reduce health hazards and to avoid dangerous situations.

### 2.41 Electrical Shock Hazard!



Risk of fatal injury from touching live parts! Damaging of the insulation or of single components can be dangerous to life!

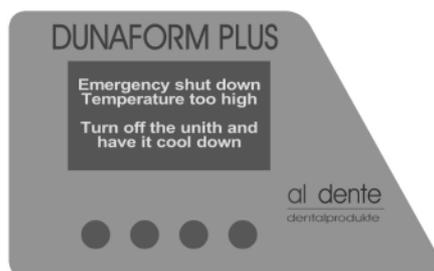
For this reason:

- When insulation is damaged, deactivate the power supply immediately and arrange for repair.
- Do not bridge or deactivate fuses. When changing fuses observe the correct amperage!
- Keep live parts from moisture. Danger of short circuit!
- After finishing thermo-forming works switch off the unit.
- After finishing thermo-forming works pull the power plug out of the socket and thereby cut the unit completely from electricity.

### 2.42 Caution! Hot surfaces!



Contact with hot surfaces heating cap (3) can cause burns.



For this reason:

Emergency shutdown once the heating chamber's temperature has exceeded the safety values.

Display (4) indicates: Emergency shutdown – Temperature too high

**Turn off the unit's power switch (10) – see page 6 - for approx. 30 minutes and have it cooled down.**

**Then a new thermoforming task can be started.**

## 3. DELIVERY CONTENTS

1 DUNAFORM PLUS	order no.	581-003-008
1 Plate reception	order no.	331-000-507
1 Insert bowl	order no.	581-004-005
1 Lead granules	order no.	581-004-015
1 Mains supply cable	order no.	214-120-006

#### 4. INCOMING CONTROL

Please check the unit and accessories immediately after receipt for probable transport damages and defects. Warranty claims can only be enforced if the vendor or shipper is informed immediately. Then a document of damage has promptly to be made up.

#### 5. TECHNICAL DATA

Mains supply	230 V AC 50 HZ ± 10 %
Max. power consumption	850 W
Fuse of unit	<b>2 x T 4 A</b>
Operating pressure	<b>max. 6 bar</b>
Pressure in hose	<b>max. 10 bar</b>
Width / Depth / Height	350x300x190 mm
Weight	8,5 kg

#### 6. INSTALLATION

##### 6.1 Initiation of the DUNAFORM PLUS

- The unit has to be put onto a stable horizontal basis in dry surrounding (not in high-humidity rooms due to jet steamers, e.g.)
- When mounting the device keep at least a distance of 30 cm to easily inflammable materials like paper, etc.
- The packaging can be disposed of with domestic waste.

##### 6.2 Mains supply

The electrical connection of the unit is only allowed in rooms which are equipped according to the directions of VDE 0107 or IEC 364-710.

Put the power cable included in the delivery into the female connector installed (12) and into an earthed wall socket. Due to safety reasons do not use flexible distributing sockets or extender cables. The power socket has to be fused with at least **10 A**.

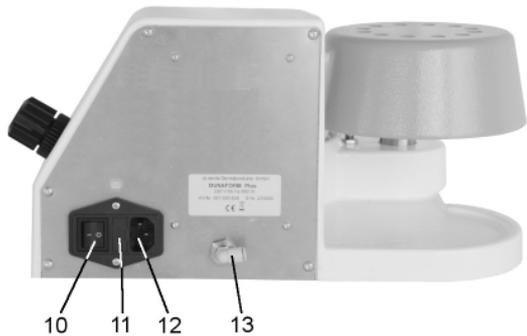
##### 6.3 Compressed air connection

Connect the unit by means of a pressure hose (outer Ø6mm) to an on-site compressed air supply or compressor (13 plug-in connector). The working pressure may not exceed 6 bar, the safety valve opens automatically as soon as the working pressure exceeds 6,2 bar. **Working pressure factory set: 4,5 bar.**

#### 7. OPERATING ELEMENTS



- 1 Foil tension ring
- 2 Foil reception for foils Ø 120 mm and Ø 125 mm
- 3 Heating cap (infrared lamp)
- 4 Display
- 5 Button „Setting“
- 6 Pressure regulator
- 7 Pressure chamber
- 8 Reception for granules and plate reception
- 9 Closing device for pressure chamber



- 10 Power switch ON-OFF
- 11 Female connector installed
- 12 Fuse carrier with fuses T 4 A
- 13 Pressure connector socket

## 8.. BASIC SETTINGS MENU

### 8.1 Selection of language

Select one of the following languages:

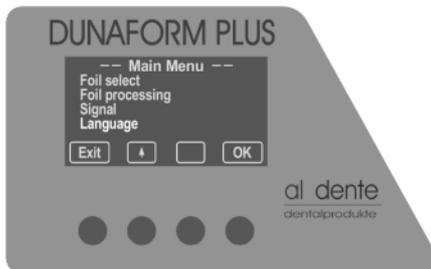
German    English    Spanish    Italian



Switch on the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX BLEACH 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

Push button „Menu“.



Display (4) indicates: Main Menu, Foil select, Foil processing, Signal, Language.

By pressing „Down“ ↓ or „Up“ ↑ chose language.

Confirm by pressing „OK“.



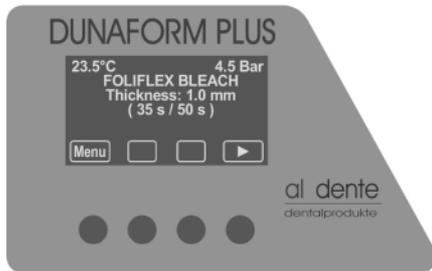
Display (4) indicates: Select language, German, English, Spanish, Italian.

By pressing „Down“ ↓ or „Up“ ↑ set the language (**e.g. English**).

Confirm by pressing „OK“.

**The language chosen is now set in all menus.**

## 8.2 Adjusting working pressure



Attach compressed air connection (13).

Switch on the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX BLEACH 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

By lifting the pressure control's rotary knob (6) – see page 5 – and turning it clock- or anti-clock-wise the pressure set can be modified.

**Working pressure factory set: 4,5 bar.**

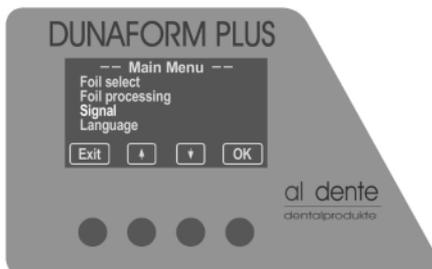
## 8.3 Signal ON / OFF



Switch on the unit (10) – see page 6.

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX BLEACH 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

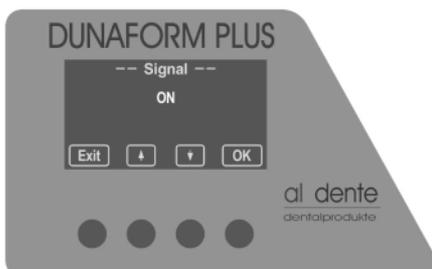
Push button „Menu“.



Display (4) indicates: Main menu, Foil select, Foil processing, Signal, Language.

By pressing „Down“ ↓ or „Up“ ↑ **choose signal**.

Confirm by pressing „OK“.

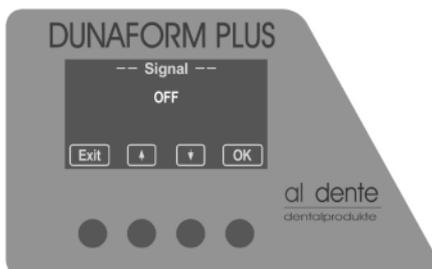


Display (4) indicates: Signal ON

Confirm by pressing „OK“.

**Signal factory set: ON. We recommend to maintain this setting.**

By pressing „Down“ ↓ you may turn the signal OFF.



Display (4) indicates: Signal OFF

Confirm by pressing „OK“.

**Then the signal is turned off for all menus.**

By pressing „UP“ ↑ the signal can be turned ON again.

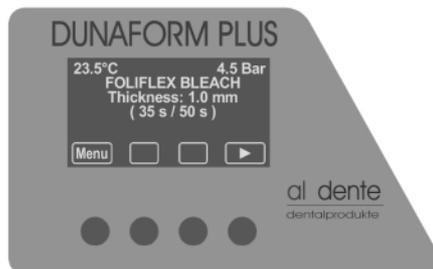
## 8.4 Adjusting / Setting various foils

### 8.4.1 Foils / sheets, brand: al dente dentalprodukte, 6 types

FOLIFLEX BLEACH	FOLIDUR S
FOLIFLEX	FOLILEN
FOLIDUR N	COMBILOC PLUS

The various thicknesses of these types of foils have already been pre-programmed.

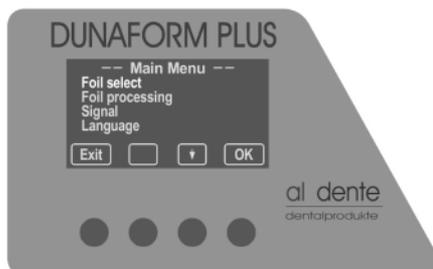
**Select foil** (foil types and foil thickness)



Switch on the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX BLEACH 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

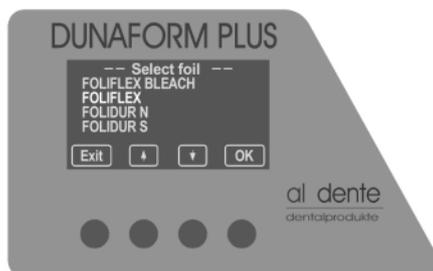
Push button „Menu“.



Display (4) indicates: Main Menu, Foil select, Foil processing, Signal, Language.

**Foil select is set**

Confirm by pressing „OK“.



Display (4) indicates: Select foil FOLIFLEX BLEACH, FOLIFLEX, FOLIDUR N, FOLIDUR S.

By pressing „Down“ ↓ or „Up“ ↑ select foil (**e.g. FOLIFLEX**).

Confirm by pressing „OK“.

Note:

By pressing „Down“ ↓ you may choose the foils FOLILEN and COMBILOC which are not displayed.



Display (4) indicates: Select thickness, Foil 0.5 mm, Foil 0.6 mm, Foil 0.7 mm, Foil 1.0mm.

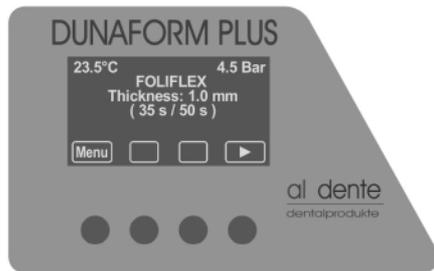
By pressing „Down“ ↓ or „Up“ ↑ select thickness (**e.g. Foil 1.0 mm**).

Confirm by pressing „OK“.

**The necessary heating and cooling time for the selected foil (e.g. FOLIFLEX 1.0 mm) is already factory set but may be modified as described under „processing foil“.**

Note:

By pressing „Down“ ↓ or „Up“ ↑ you may choose thicknesses which are not displayed.

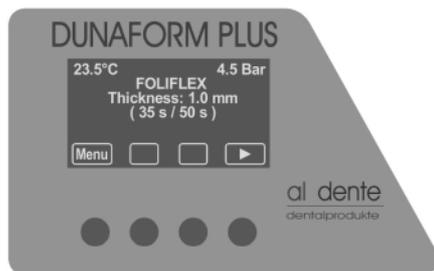


Display (4) shows: Start menu

**FOLIFLEX**  
**Thickness 1.0 mm**  
**(35 s / 50 s)**

the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

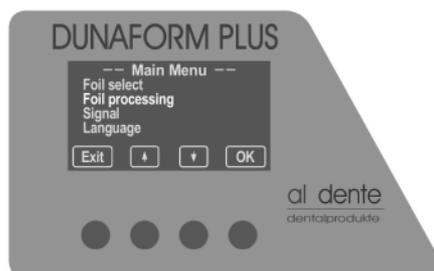
### Foil processing (heating time and cooling time)



Switch on the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

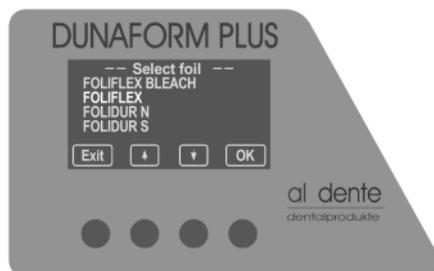
Press button „Menu“



Display (4) shows: Main menu, Foil select, Foil processing, Signal, Language.

With button „Down“ ↓ or button „Up“ ↑ set to **foil processing**

Confirm by pressing “OK”.



Display (4) shows: Select foil, FOLIFLEX BLEACH, FOLIFLEX, FOLIDUR N, FOLIDUR S.

With button „Down“ ↓ or button „Up“ ↑ set to foil (**e.g., FOLIFLEX**).

Confirm by pressing “OK”.

Note:

By pressing „Down“ ↓ you may choose the foils FOLILEN and COMBILOC which are not displayed.



Display (4) shows: Select thickness, Foil 0.5 mm, Foil 0.6 mm, Foil 0.7 mm, Foil 1.0 mm.

With button „Down“ ↓ or button „Up“ ↑ set to thickness (**e.g., Foil 1.0 mm**).

Confirm by pressing “OK”.

Note:

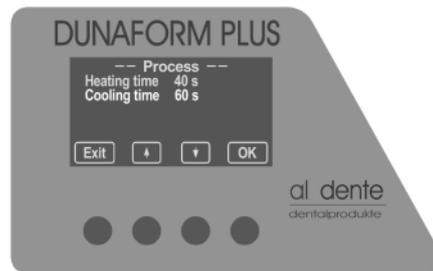
By pressing „Down“ ↓ or „Up“ ↑ you may choose thicknesses which are not displayed.



Display (4) shows: Process Heating time.

With button „Down“ ↓ or button „Up“ ↑ set to heating time (e.g., 40 s).

Confirm by pressing “OK”.



Display (4) shows: Process Heating time 40 s and Cooling time.

The heating time indicated 40s has been taken over from “menu heating time”

With button „Down“ ↓ or button „Up“ ↑ set to cooling time (e.g., 60 s).

Confirm by pressing “OK”.



Display (4) shows: Start menu

**FOLIFLEX**  
**Thickness 1.0 mm**  
**(40 s / 60 s)**

the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

#### 8.4.2 Types of foils by other manufacturers: 11 types

##### FOIL 1 - FOIL 11

In the menu under „foil processing“ one can assign the thickness and the necessary heating time to each of these 10 foils.

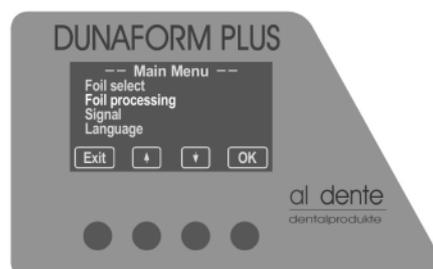
##### Foil processing (foil types, foil thickness, heating time and cooling time)



Switch ON the unit at the power switch (10) (see page 6).

After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

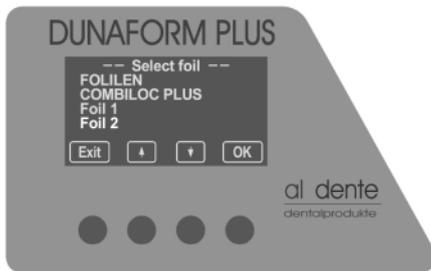
Press button „Menu“



Display (4) shows: Main menu, Foil select, Foil processing, Signal, Language.

With button „Down“ ↓ or button „Up“ ↑ set **foil processing**

Confirm by pressing “OK”.



Display (4) shows: Select foil, FOLILEN, COMBILOC PLUS, Foil 1, Foil 2.

With button „Down“ ↓ or button „Up“ ↑ set to foil (**e.g., FOIL 2**).

Confirm by pressing “OK”.



Display (4) shows: Select thickness, Foil 0.6 mm, Foil 0.7 mm, Foil 1.0 mm, Foil 1.5 mm.

With button „Down“ ↓ or button „Up“ ↑ set to thickness (**e.g., Foil 1.5 mm**).

Confirm by pressing “OK”.



Display (4) shows: Process, Heating time.

With button „Down“ ↓ or button „Up“ ↑ set to heating time (**e.g., 60 s**).

Confirm by pressing “OK”.



Display (4) shows: Process, Heating time 60 s, cooling time

The indicated heating time 60 s was taken from the menu „set heating time”.

With button „Down“ ↓ or button „Up“ ↑ set to cooling time (**e.g. 90 s**)

Confirm by pressing “OK”.



Display (4) shows: Start menu

**Foil 2**  
**Thickness 1.5 mm**  
**(60 s / 90 s)**

the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

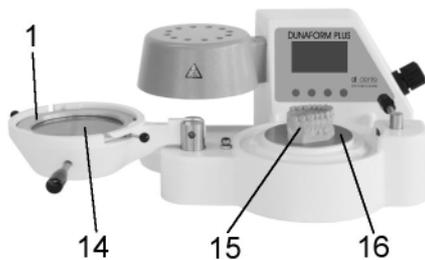
9. RELEVANT INFORMATION FOR OPERATING THE UNIT



Unlock the pressure chamber (7) by turning the closing device (9) counter-clockwise.



Lift off the pressure chamber (7) and swivel it for 180° all the way. Turn the foil tension ring (1) clockwise and take it off.



Insert the foil (14) centrally into the foil reception (2). Insert the foil tension ring (1) and turn it as far as it will go counter-clockwise.

Working with the plate reception (16):  
Put the model (15) onto the plate reception (16).

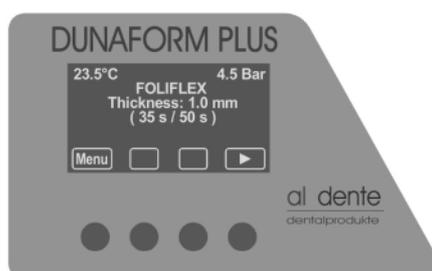


Working with granules:  
Remove the plate reception (16) and the insert bowl from the granular reception.

Fill the granules into the granular reception (8) or into the insert bowl.  
Embed the model (15) into the granules.



Turn on the unit: power switch (10).



After completion of the self-test the display (4) indicates the start menu showing the latest type of foil used (e.g. FOLIFLEX 1.0 mm), the pressure set at the pressure controller, the temperature of heating cap, menu and arrow.

Press button „arrow“.



**WARNING !**

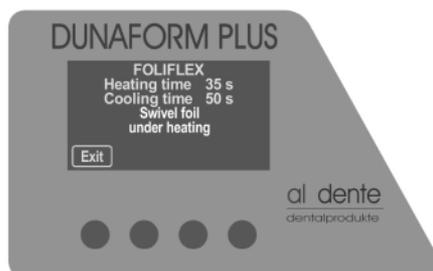
When the working pressure is too low, the display (4) indicates:

**Warning  
Pressure not ok  
e.g. (1,5 bar)**

Switch OFF the unit at the power switch (10) and back ON again (see page 6).

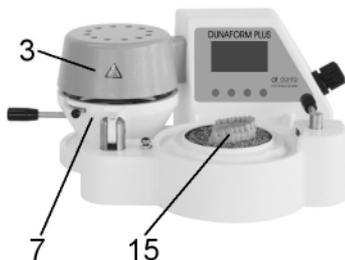
Check working pressure (see pressure in display (4)) and increase pressure at pressure controller (7) accordingly.

**Factory set: 4,5 bar (recommended)**



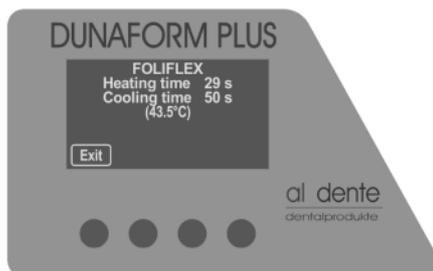
Display (4) shows:

**FOLIFLEX  
Heating time 35 s  
Cooling time 50 s  
Swivel foil  
under heating**



Swivel the pressure chamber (7) below the heating cap (3).

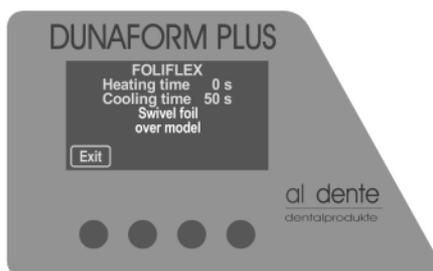
After termination of the thermoforming procedure, the heating time necessary can be recorded by pressing the button „Exit“ again.



The process initiated by the operator is shown on the display (4).

**FOLIFLEX  
Heating time 29 s  
Cooling time 50 s  
(43,5 °C)**

After termination of the heating time the display (4) indicates the following menu and the acoustic signal sounds.



Display (4) shows:

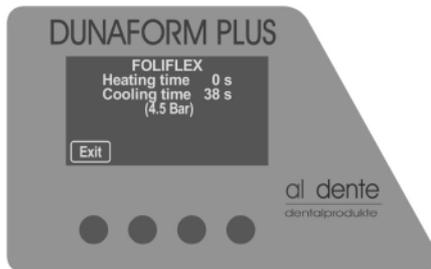
**FOLIFLEX  
Heating time 0 s  
Cooling time 50 s  
Swivel foil  
over model**



Swivel the pressure chamber (7) all the way off the heating cap (3).

Put the pressure chamber (7) over the model and lock it by means of turning the closing device (9) clockwise.

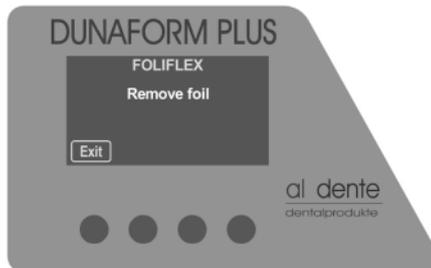
When the cooling time has elapsed, Menu 3 is displayed and the acoustic signal sounds.



The process initiated by the operator is shown on the display (4).

FOLIFLEX  
Heating time 0 s  
Cooling time 38 s  
(4.5 Bar)

After termination of the cooling time the display (4) indicates the following menu and the acoustic signal sounds.



Display (4) indicates:

FOLIFLEX  
**Remove foil**



Unlock the pressure chamber (7) by turning the closing device (9) anti-clockwise and at the same time push on top of the pressure chamber (7).

Lift off the pressure chamber (7) and swivel it for 180° all the way.

Turn the foil tension ring (1) counter-clockwise all the way and take it out.



Take out the thermo-formed result (17).

## 10. EXCHANGE OF FUSES



The fuses are situated in the female connector installed (12).

The fuse is to be exchanged as follows:

- Unplug the mains supply cable from the female connector installed (12).
- Open at the indentation the cover of the fuse carrier (11) by means of a screwdriver (size 1) and pull it out.
- Exchange the defect fuse. Attention: The fuse rating stated on page 6 needs urgently to be observed!
- Put the fuse carrier (12) back into the female connector installed (11).
- Connect mains supply cable to the female connector installed (11).

## 11. TROUBLESHOOTING

Error description	Remedy
Display (4) remains blank	<p>Check the mains socket – when defect use another mains socket.</p> <p>Check power cord – when defect exchange the power cord.</p> <p>Check the fuse – when defect exchange the fuse.</p> <p>Control card or display / control is defect – the control card resp. the display / control has to be exchanged (service technician)</p>
Display flashes and the acoustic signal gives acoustic sound	<p>Temperature sensor is defect, have the device checked (service technician).</p>
Heating element (3) in the heating chamber without function	<p>Heating element is defect – it needs to be exchanged (service technician)</p> <p>Control card is defect – it needs to be exchanged (service technician)</p>
Foil has not properly been thermoformed	<p>Heating time for this specific foil was too short – adjust heating time for this kind of foil.</p> <p>Working pressure too low - adjust working pressure – see page 7.</p>

## 12. HEATING TIME AND COOLING PERIOD

### 12.1 Foil type brand al dente dentalprodukte GmbH (recommendation)

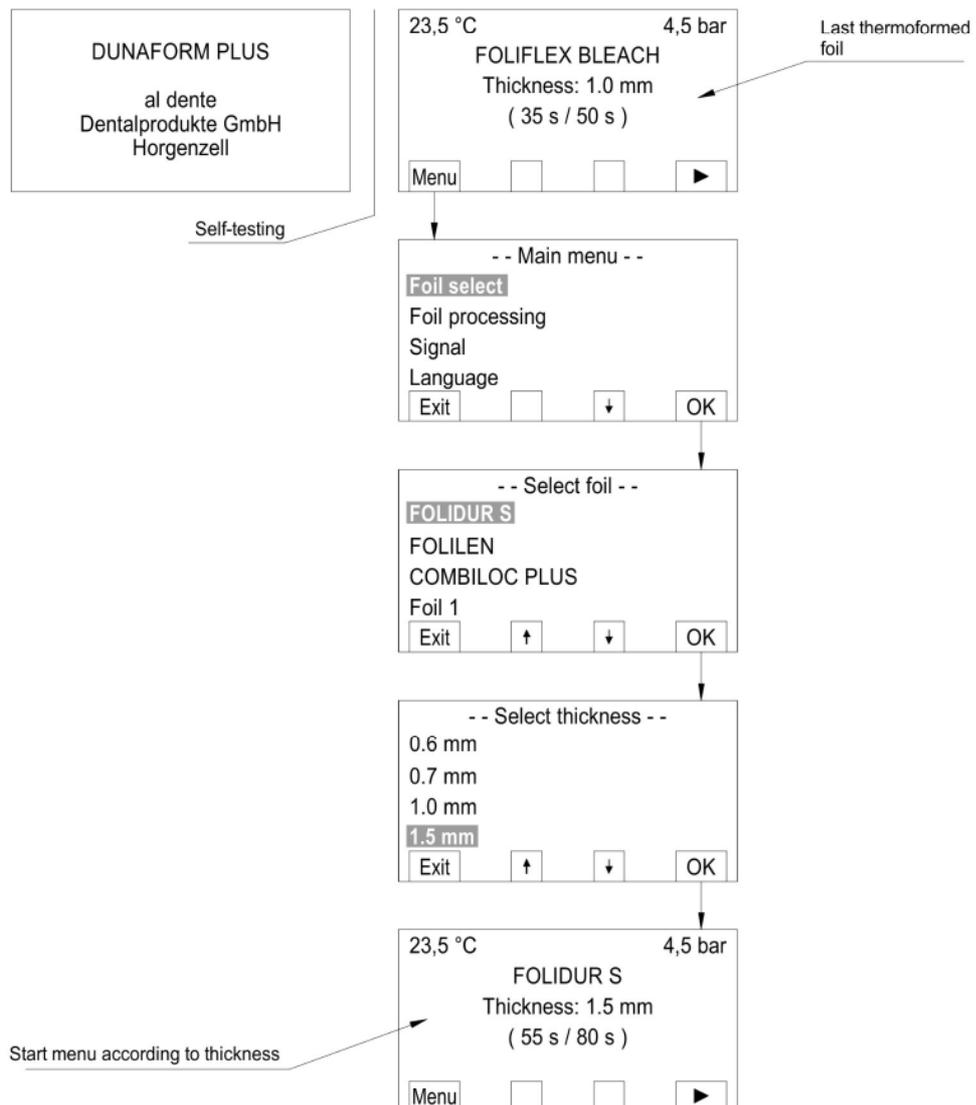
Foil	Thickness [mm]	 s	 s
FOLIFLEX, transparent	1,0	35	50
	1,5	35	50
	2,0	40	60
	3,0	60	90
	4,0	80	120
FOLIFLEX bleach, transparent	1,0	35	50
FOLIDUR-N, transparent	0,5	35	50
	1,0	45	70
	1,5	55	80
	2,0	85	130
	3,0	100	150
FOLIDUR-S, transparent	1,0	45	70
	1,5	55	80
	2,0	85	130
	3,0	100	150
FOLILEN, opaque	0,5	35	55
	0,6	40	60
	0,7	45	60
	1,0	50	70
	1,5	60	90
COMBILOC PLUS, transparent	2,0	65	90
	3,0	85	120

### 12.2 Foil type of other brands (Note: when using other products the heating / cooling times may vary)

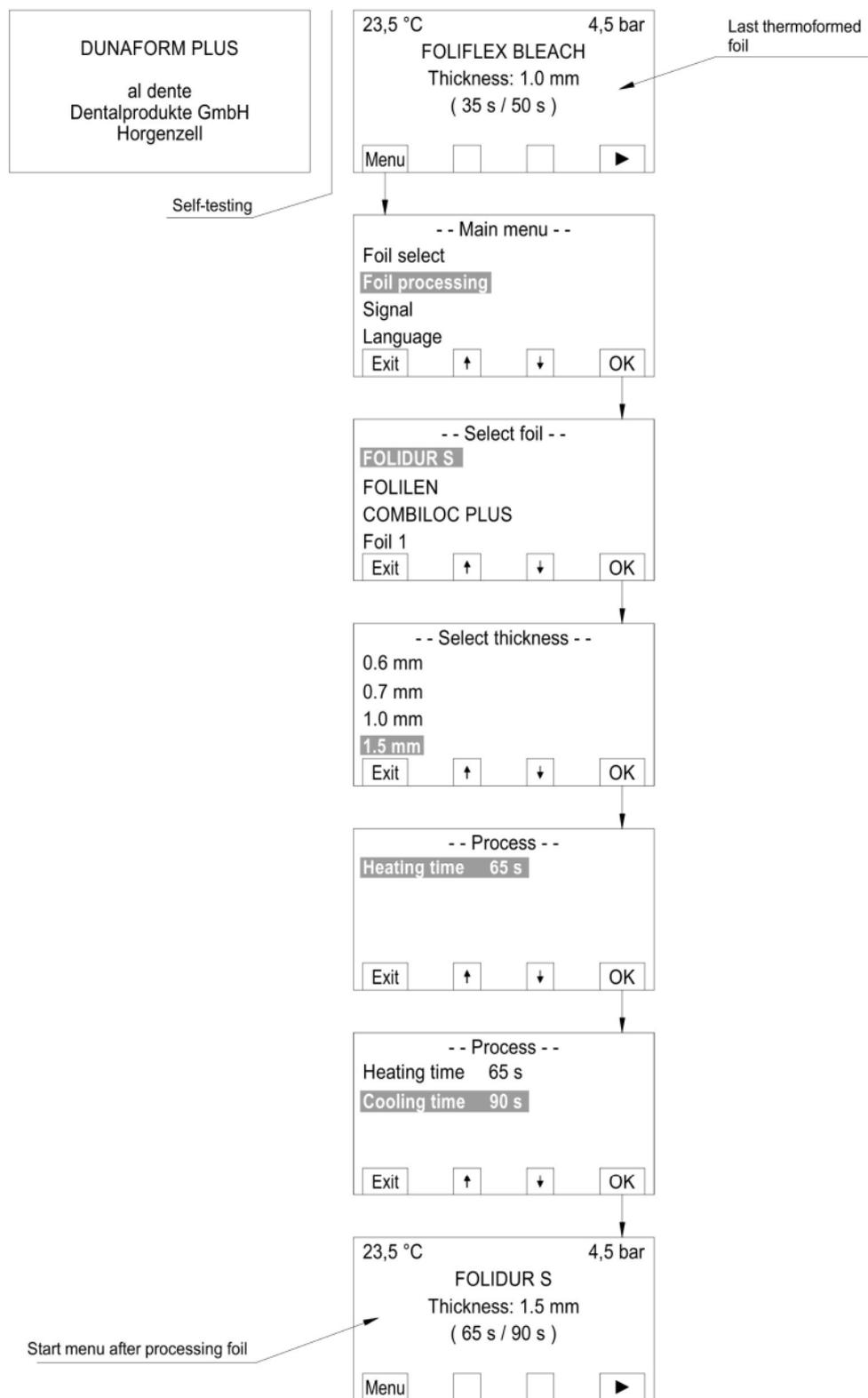
Foil	Thickness [mm]	 s	 s
Flexible foils, material EVA (Ethyl-Vinyl-Acetate)	1,0	35	50
	1,5	35	50
Also flexible bleaching foils	2,0	40	60
	3,0	60	90
	4,0	80	120
Hard-elastic foils, material PETG copolyester	0,5	35	50
	1,0	45	70
	1,5	55	80
	2,0	85	130
	3,0	100	150
Viscous-hard foils, material SBS (Styrol-Butadien-Styrol)	1,0	45	70
	1,5	55	80
	2,0	85	130
Soft, resilient foils, material PE (Polyethylen)	0,5	35	55
	0,6	40	60
	0,7	45	60
	1,0	50	70
	1,5	60	90
2-layer soft-hard foils, materials PET-G (hard) and TPU (soft)	2,0	70	100
	3,0	80	120
Mouthguard foils	3,0	60	90

13. MENU SEQUENCE

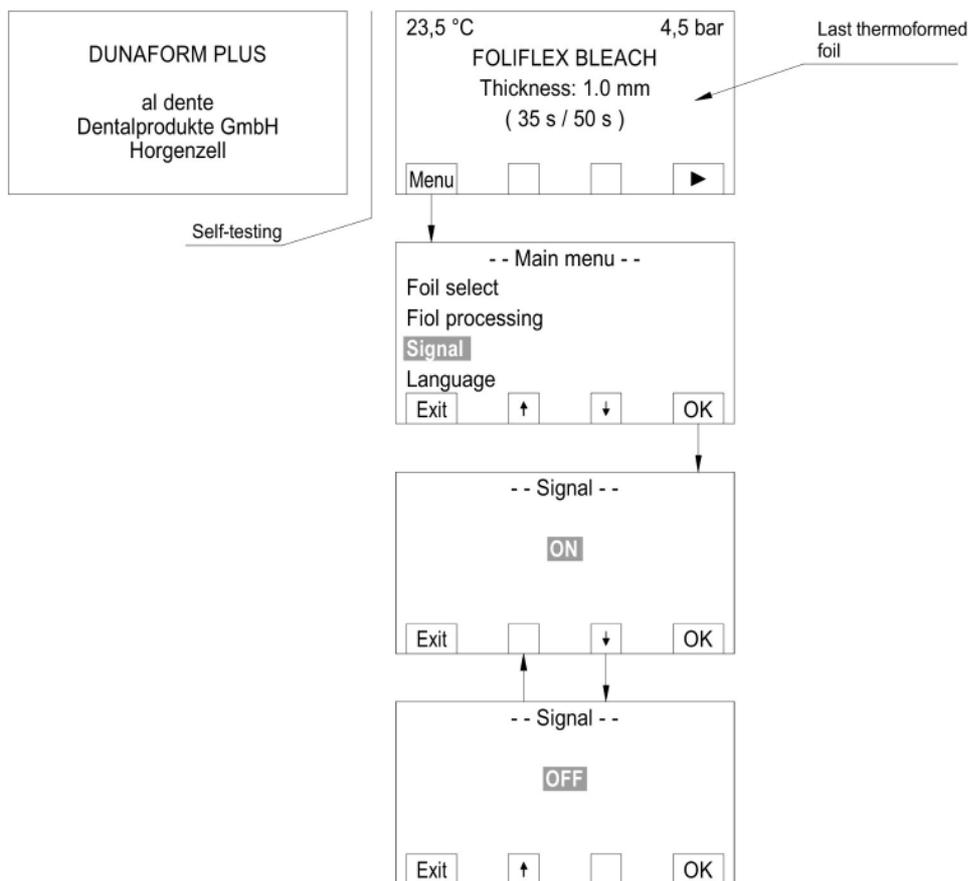
Example 1: Menu sequence "select foil"



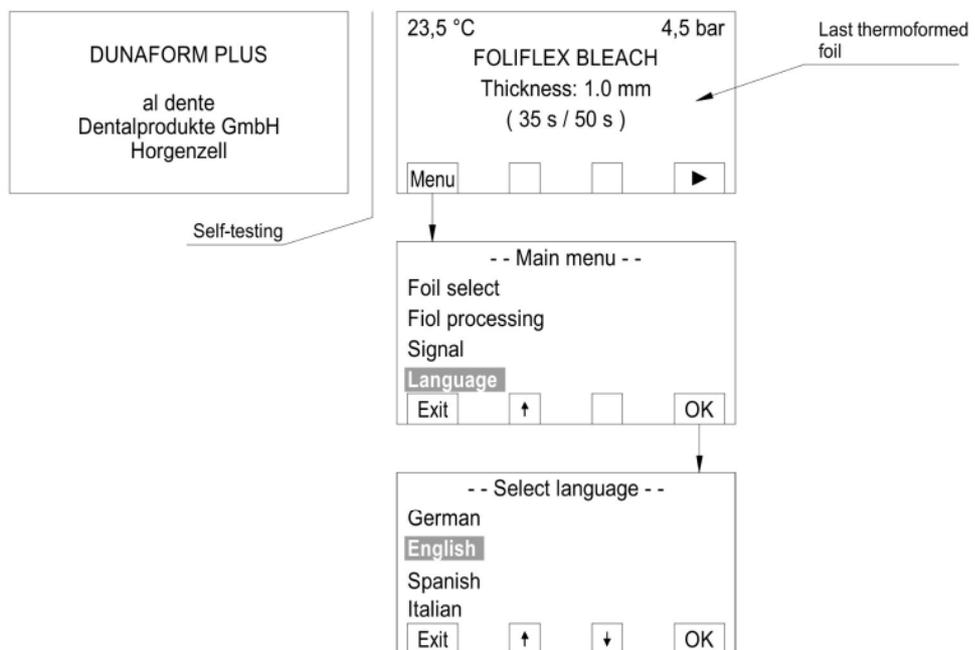
Example 2: Menu sequence "select processing" (heating time and cooling time)



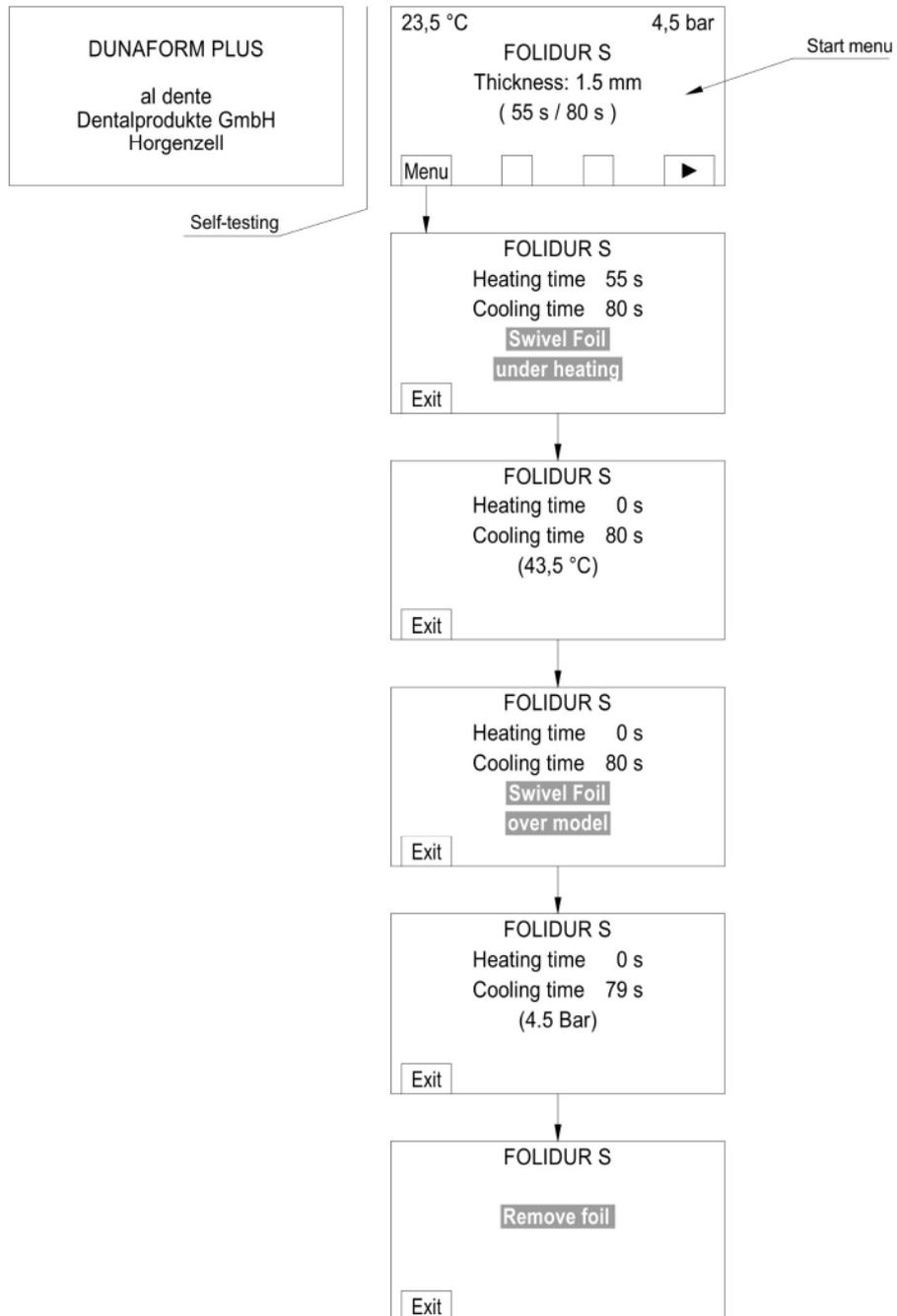
Example 3: Menu sequence "set acoustic signal"



Example 4: Menu sequence "select language"



Example 5: Menu sequence "thermoforming"



14. DECLARATION OF CONFORMITY



**Declaration of Conformity**  
for  
al dente Dentalprodukte GmbH

our  
Thermoforming unit  
"Dunaform Plus"  
is developed, constructed and produced according  
to following guidelines

EC - guideline 89/336/EEC  
EC - guideline 89/392/EEC  
EC - guideline 72/23/EEC

Certified according to:  
EN55011  
EN61000-3-2  
EN61000-3-3  
EN61000-4-2  
EN61000-4-3  
EN61000-4-4  
EN61000-4-5  
EN61000-4-6  
EN61000-4-11

Horgenzell, July, 25<sup>th</sup>, 2017   
Christoph Vitzthum CEO

al dente Dentalprodukte GmbH • Am Tobel 15 • D-88263 Horgenzell

al dente Dentalprodukte GmbH  
Am Tobel 15  
88263 Horgenzell

Tel.: +49(0) 7504 970 91-0  
Fax: +49(0) 7504 970 91-20

E-Mail: [info@aldente.de](mailto:info@aldente.de)  
Internet: [www.aldente.de](http://www.aldente.de)

• 120318 • © by al dente dentalprodukte GmbH  
Reproduktion, including excerpts, prohibited.  
Alteration in technology and designed reserved.