

# DC Ceram™



concept *Press*



concept *Art*

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# 1.1 Material and indications, contraindications

The Ceramay conceptPress pressable ceramic ingots are based on a very solid glass ceramic material and are coloured in shades that match the VITA®\* Classical shades A1 to D4. Besides that, 3 bleach ingots with different values are offered.

They are intended exclusively for dental use by trained professionals.

The mechanical strength and optical properties make conceptPress suitable for the production of conventionally or adhesively cemented all-ceramic single-tooth restorations anywhere in any jaw (full and partial crowns, inlays, veneers) and for the production of three-unit anterior bridges and premolar bridges that include the second premolar as the terminal abutment. Observe all rules on minimum wall thicknesses and connector cross-sections.

Restorations can be finalized using the staining or layering technique with DCceram 9.2 veneering ceramics, stains (conceptArt), shades and glazes.

Contraindications:

- Any combinations with materials outside the product system described and/or with materials by third-party manufacturers.
- Use in the production of restoration types not explicitly mentioned.
- Restorations that violate the following rules on minimum wall thicknesses or connector cross-sections must not be produced.
- All-ceramic restorations made of conceptPress are not suitable for patients with bruxism or parafunctional habits.

## 1.2 concept*Press* Press ingots

Ceramay conceptPress pressable ceramic ingots are offered in three levels of translucency, D, ID and CT, for different processing techniques:

- Staining technique (CT)
- Staining and layering technique (D)
- Layering technique (ID)

The ID translucency level comprises a series of five ingots (ID1 to ID5) for layered restorations in 16 Vita Classical shades. They are also used as a framework material in the presence of severely discoloured natural abutments.

Translucency level D is available in 16 Vita Classical shades (A1 to D4) shade guide for the staining and layering technique. The translucency level D series will additionally include three bleach ingots, BL1 to BL3).

The three transparent ingots of the CT series (CT1 to CT3) are intended mainly for the production of inlays, onlays and veneers that are finished using the staining technique.

In principle, any indicated restoration shape can be produced from any ingot. For aesthetic reasons, the following assignment of translucency values to the various techniques and indications is recommended.

| Translucency | Technique          |                  |                    | Indication |        |               |                      |                       |                   |
|--------------|--------------------|------------------|--------------------|------------|--------|---------------|----------------------|-----------------------|-------------------|
|              | Staining technique | Reduced layering | Layering technique | Veneers    | Inlays | Partial crown | Anterior tooth crown | Posterior tooth crown | Three unit bridge |
| high CT      | ×                  |                  |                    | ×          | ×      |               | ×                    |                       |                   |
| medium D     | ×                  | ×                |                    | ×          |        | ×             | ×                    | ×                     | ×                 |
| low ID       |                    | ×                | ×                  |            |        |               | ×                    | ×                     | ×                 |

# 1.3 Preparation notes and minimum wall thicknesses

Prepare the hard tooth structure according to the familiar rules for all-ceramic restorations:

- Prepare a rounded shoulder or a chamfer.
- Avoid sharp edges and line angles. Provide rounded edges and line angles instead.

For minimum wall thicknesses for bridges (in mm), connector cross-sections (in mm<sup>2</sup>) and the maximum pontic widths (in mm) for individual indications and processing techniques, please refer to the following table:

**Please note:** At least 50% of the total wall thickness of the restoration must consist of high-strength pressable ceramics! Where much hard tooth structure must be restored, increase the amount of high-strength pressable ceramics used, rather than the amount of layering ceramics.

|   |                  | Veneers   | Inlays | Onlays | Crowns         |                 | Three unit bridges |               |
|---|------------------|-----------|--------|--------|----------------|-----------------|--------------------|---------------|
|   |                  |           |        |        | anterior tooth | posterior tooth | anterior area      | premolar area |
| Staining technique                                      | circular         | 0.3 - 0.6 | 1.0    | 1.5    | 1.2            | 1.5             | 1.2                | 1.5           |
|   | incisal/occlusal | 0.4 - 0.7 | 1.0    | 1.5    | 1.5            | 1.5             | 1.5                | 1.5           |
| Reduced layering technique                              | circular         | 0.6       | -      | 1.5    | 1.2            | 1.5             | 1.2                | 1.5           |
|   | labial/occlusal  | 0.4       | -      | 0.8    | 0.4            | 0.8             | 0.8                | 0.8           |
| Layering technique                                      | circular         | -         | -      | -      | 0.6            | 0.8             | 0.8                | 0.8           |
|   | incisal/occlusal | -         | -      | -      | 0.6            | 0.8             | 0.8                | 0.8           |
| <b>In principle anatomically reduced shape of teeth</b> |                  |           |        |        |                |                 |                    |               |
| Connector cross-sections                                |                  | -         | -      | -      | -              | -               | 16                 | 16            |
| Pontic width  |                  | -         | -      | -      | -              | -               | 11                 | 9             |

# 1.4 Modelling

## Preparing the cast

Prepare the dies as usual.

Apply the die spacer in several layers, depending on the type of preparation: For veneers and for full and partial crowns apply two layers of spacer up to 1mm in thickness apically to the finish line.

For inlays and onlays, apply up to three layers of spacer up to 1mm in thickness above the cavity floor.

## Wax-up

Using a wax that burns out during firing without residue, depending on the technique used (layering, cut-back or staining), wax up the restorations to their full anatomic and functional contour.

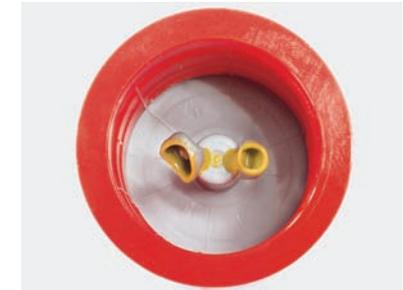
When using the cut-back or layering technique, do not create sharp edges or line angles. For the layering technique, build up the frameworks to a reduced anatomic contour and provide cusp support.



## Attaching the pressing sprues

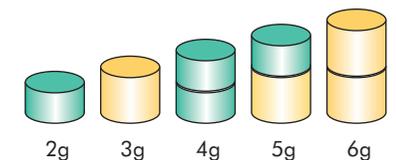
Attach a wax channel 4 to 6mm in length and 3mm in diameter directly to the thickest portion of the wax-up in the direction of the flow. Make sure that the sprue edges on the pressing object and on the investment base are well-rounded.

The wax-up should keep a distance of at least 10mm from the silicone ring and should not be longer than 16mm overall (wax-up plus sprue).



## Weigh the wax-up and sprue together:

- Up to max. 0.6 g wax weight use 1 x 2g ingot
- Up to max. 0.9 g wax weight use 1 x 3g ingot
- Up to max. 1.3 g wax weight use 2 x 2g ingots
- Up to max. 1.6 g wax weight use 1 x 2g + 1 x 3g ingots
- Up to max. 2.0g wax weight use 2 x 3 g ingots



2g 3g 4g 5g 6g

# 1.5 Investing technique - Preheating



## Investing technique

Pour the investment compound into the ring. Avoid bubbles. Remove excess investment compound after setting and make sure that the investment ring is in a vertical position.

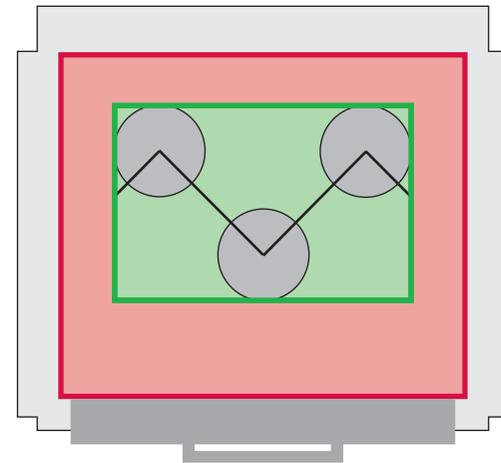


## Note:

- Follow the investment manufacturer's instructions
- Do not pre-heat the ingots.
- Do not pre-heat disposable plungers from Zubler.

## Preheating

The investment ring must spend at least 60 minutes in the furnace at the final temperature of 850°C.



Positioning of the rings in the preheating oven (top view)

## Note:

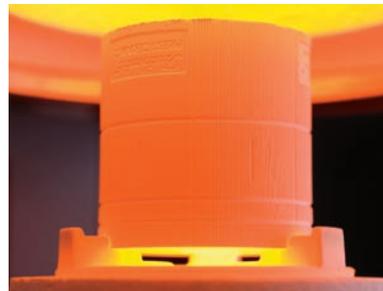
The distance between the rings and the inner walls of the furnace as well as the distance between the single rings must be minimum 2.5cm. Do not put any rings on the front third of the surface area of the furnace (with big devices on the front quarter), as due to the door no homogeneous distribution of the heat is possible. Position the rings on that area in the furnace, which is marked green. To avoid a formation of shades between the rings, they should not be positioned in a straight line.

# 1.6 Pressing

## Pressing

Choose the right press program according to the ring size (100g or 200g) and the amount of ceramics ( $\leq 3g$ ,  $\leq 4g$ ,  $> 4g$ ) you want to use.

Pay attention that you press just one ingot in the 100g ring.



Before the actual pressing, run the pressing program once without load to make sure the pressing furnace is completely heated through. At the moment the pressing furnace indicates it is ready to press, open the furnace and at the same time remove the investment ring from the preheating furnace. Now insert the ingot and pressing plunger in the investment ring and place it, in a vertical position, on the tray of the pressing furnace.

Temperatures, holding times and pressing times were determined using Zubler VARIO PRESS 300 and VARIO PRESS 300.e ovens. Depending on the pressing result, temperature, holding time or pressing time may have to be adjusted for other pressing furnaces.



### Important note:

Use disposable plungers only. Place the ingots and the disposable plungers inside the investment ring without preheating!

### Standard Press Program (VARIO PRESS 300.e):

|                     | Start temp.<br>in °C | Heat rate<br>in °C/min | Final temp.<br>in °C | Hold time<br>in min | Press time<br>in min | Pressure | Vacuum<br>in mm | Opening time<br>in min |
|---------------------|----------------------|------------------------|----------------------|---------------------|----------------------|----------|-----------------|------------------------|
| 100g ring $\leq 3g$ | 700                  | 60                     | 910                  | 18:00               | 3:00                 | low      | 720             | 0:00                   |
| 200g ring $\leq 4g$ | 700                  | 60                     | 915                  | 20:00               | 3:00                 | low      | 720             | 0:00                   |
| 200g ring $> 4g$    | 700                  | 60                     | 920                  | 20:00               | 3:00                 | low      | 720             | 0:00                   |

The press parameters specified above are guidance values and must be adjusted if necessary.

# 1.7 Divesting + Finishing



## Divesting

When using the Zubler Flexring system, remove the top and the bottom part of the investment ring along the section line. Coarsely sandblast with polishing beads at 4 bar, then reduce the pressure to 2 bar when the pressed objects become visible.



## Removing the reaction layer

Coarsely divest with aluminium oxide ( $125\mu\text{m}$  grain size, 2 bar). At this stage of procedure do not sandblast the inside of the pressing objects!

Once the coarse divestment of the pressed objects is completed, use fine divestment glass beads with a grain size of  $50\mu\text{m}$ . If a reaction layer has formed on the surface, this can be easily removed with aluminium oxide ( $50\mu\text{m}$ , 2 bar). It is not necessary to acid-wash the pressed ceramics.



## Finishing

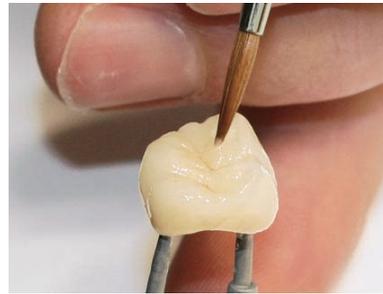
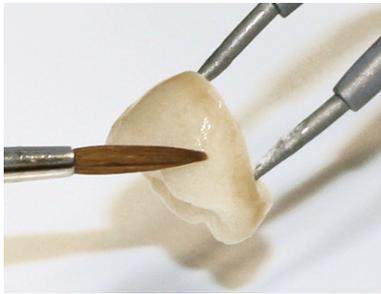
Use only suitable grinding instruments for finishing conceptPress, as a failure to do so may lead to chipping at the edges.

- Keep grinding to the necessary minimum.
- Cut the sprues with a diamond disc.
- Work with low speed and light pressure; in any case avoid overheating the ceramic material

Remove premature contacts with fine diamond cutters. The attachment points of the sprues must be ground to their correct functional shape, finishing surface structures using suitable grinding stones.

Sandblast the restoration with aluminium oxide at 1 bar pressure and clean with a steam cleaner.

## 2 Staining technique



### Note:

Support stained objects by an individual firing tray (e.g. Easy-Fix).

### Stain and glaze firing

For shade characterization, use conceptArt stains, shades and glaze ceramics.

Apply the glaze or stain paste to the restoration in a thin layer.

Fire at a heating rate of 45°C/min to a final temperature of 770°C to 790°C, depending on the desired lustre.

Use no vacuum during the holding time.

### General firing table:

|              | Start temp.<br>in °C | Pre - dry<br>in min | Closing<br>time<br>in min | Heat<br>rate<br>in °C/min | Final temp.<br>in °C | Hold<br>time<br>in min | Vacuum | Opening<br>time<br>in min |
|--------------|----------------------|---------------------|---------------------------|---------------------------|----------------------|------------------------|--------|---------------------------|
| Shade/Stain  | 450                  | -                   | 4:00                      | 45                        | 780                  | 1:00                   | yes    | 6:00                      |
| Glaze firing | 450                  | -                   | 4:00                      | 45                        | 790                  | 1:00                   | no     | 6:00                      |

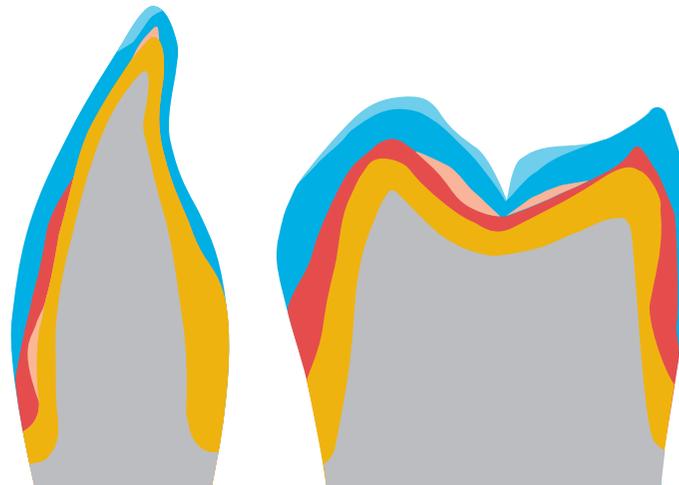
### 3 Layering technique



For the layering technique, any conceptArt and DCceram 9.2 veneering ceramics can be used, with the exception of the shoulder masses. The firing temperature of shoulder masses is too high, and at the same time, reduction of the shoulder might weaken the restoration.

After finishing and cleaning the pressed objects, apply the DCceram 9.2 or conceptArt ceramics in the usual way.

- Chroma dentin or Modifier
- Enamel
- Transpa
- Framework
- Dentin



## 3.1 Layering with DCeram 9.2

### First firing

After applying the dentine, the crown is fired with a starting temperature of 450°C and a heating rate of 45°C/min up to 780°C. The holding time is 1 minute, the opening time is 2 minutes.

After the first dentine firing, finish the object and clean well.

Then apply dentines and incisors for the second dentine firing.



\* Opening time for the Zubler VARIO 200 ZR: 45°C/min

### Second firing

Same procedure as for the first dentine firing, but with a final temperature of 770°C.



### Stain/Glaze Firing

After finishing with diamond instruments, carefully clean the object and apply a thin layer of the stain/glaze paste to the restoration.

Fire at a heating rate of 45°C/min to a final temperature of 740°C to 750°C, depending on the desired lustre.

Use no vacuum during the holding time.

#### General firing table:

|          | Start temp.<br>in °C | Pre - dry<br>in min | Closing<br>time<br>in min | Heat<br>rate<br>in °C/min | Final temp.<br>in °C | Hold<br>time<br>in min | Vacuum | Opening<br>time<br>in min |
|----------|----------------------|---------------------|---------------------------|---------------------------|----------------------|------------------------|--------|---------------------------|
| Dentin 1 | 450                  | -                   | 6:00                      | 45                        | 780                  | 1:00                   | yes    | 4:00                      |
| Dentin 2 | 450                  | -                   | 5:00                      | 45                        | 770                  | 1:00                   | yes    | 4:00                      |

#### General firing table:

|              | Start temp.<br>in °C | Pre - dry<br>in min | Closing<br>time<br>in min | Heat<br>rate<br>in °C/min | Final temp.<br>in °C | Hold<br>time<br>in min | Vacuum | Opening<br>time<br>in min |
|--------------|----------------------|---------------------|---------------------------|---------------------------|----------------------|------------------------|--------|---------------------------|
| Shade/Stain  | 450                  | -                   | 4:00                      | 45                        | 740                  | 1:00                   | yes    | 4:00                      |
| Glaze firing | 450                  | -                   | 4:00                      | 45                        | 750                  | 1:00                   | no     | 4:00                      |

## 3.2 Combination table

Combination table layering technique (D and ID ingots)

| Colour group            | A  |    |    |      |    | B  |    |    |    | C  |    |    |    | D  |    |    |
|-------------------------|----|----|----|------|----|----|----|----|----|----|----|----|----|----|----|----|
| Tooth colour            | A1 | A2 | A3 | A3.5 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | D2 | D3 | D4 |
| conceptPress D - ingot  | A1 | A2 | A3 | A3.5 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | D2 | D3 | D4 |
| conceptPress CT - ingot | 1  | 1  | 2  | 2    | 3  | 1  | 1  | 2  | 3  | 1  | 3  | 3  | 3  | 1  | 1  | 3  |
| conceptPress ID - ingot | 1  | 2  | 2  | 2    | 4  | 1  | 1  | 2  | 2  | 1  | 3  | 3  | 4  | 1  | 5  | 5  |
| DCceram 9.2 Dentin      | A1 | A2 | A3 | A3.5 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | D2 | D3 | D4 |
| DCceram 9.2 Enamel      | 1  | 2  | 2  | 4    | 4  | 1  | 2  | 3  | 4  | 2  | 2  | 3  | 4  | 1  | 2  | 3  |



The programs **Advanced Press** for the conceptPress ceramics are just integrated in the VARIO PRESS 300.e

**Note:** These firing and pressing temperatures were determined for the Zubler VARIO 200 and the Zubler pressing furnace VARIO PRESS 300.e and are guidance values. Other types of ovens may require adjusted firing temperatures.

## 3.3 Pressing programs and firing tables

### PRESSING PROGRAMS conceptPress (VARIO PRESS 100, VARIO PRESS 300)

|           | Start temp.<br>in °C | Heat rate<br>in °C/min | Final temp.<br>in °C | Hold time<br>in min | Press time<br>in min | Vacuum<br>in mm | Pressure |
|-----------|----------------------|------------------------|----------------------|---------------------|----------------------|-----------------|----------|
| 100g ≤ 3g | 700                  | 60                     | 910                  | 18:00               | 3:00                 | 720             | low      |
| 200g ≤ 4g | 700                  | 60                     | 915                  | 20:00               | 3:00                 | 720             | low      |
| 200g > 4g | 700                  | 60                     | 920                  | 20:00               | 3:00                 | 720             | low      |

### PRESSING PROGRAMS conceptPress (EP3000, EP5000)

|           | Start temp.<br>in °C | Heat rate<br>in °C/min | Final temp.<br>in °C | Hold time<br>in min | Press time<br>in min | Vacuum start<br>in °C | Abort speed<br>in μm/min |
|-----------|----------------------|------------------------|----------------------|---------------------|----------------------|-----------------------|--------------------------|
| 100g ≤ 3g | 700                  | 60                     | 910                  | 18:00               | -                    | 700                   | 600                      |
| 200g ≤ 4g | 700                  | 60                     | 915                  | 20:00               | -                    | 700                   | 600                      |
| 200g > 4g | 700                  | 60                     | 920                  | 20:00               | -                    | 700                   | 600                      |

### FIRING TABLE DCceram 9.2

|                                 | Start temp.<br>in °C | Closingtime<br>in min | Dentin 1<br>in °C | Dentin 2<br>in °C | Heat rate<br>in °C/min | Hold time<br>in min | Vacuum | Opening time<br>in min |
|---------------------------------|----------------------|-----------------------|-------------------|-------------------|------------------------|---------------------|--------|------------------------|
| Dentin/Incisal                  | 450                  | 6:00                  | 780               | 770               | 45                     | 1:00                | yes    | 3:00-5:00              |
| Glaze/Stains Layering technique | 450                  | 4:00                  | 750               | 750               | 45                     | 1:00                | yes    | 3:00-5:00              |
| Glaze/Stains Staining technique | 450                  | 4:00                  | 780               | 780               | 45                     | 1:00                | yes    | 3:00-5:00              |
| Correction                      | 450                  | 4:00                  | 720               | -                 | 45                     | 1:00                | yes    | 3:00-5:00              |

## 3.4 Technical Data

### Indication to the material

|   |   |   |
|---|---|---|
| Description of material:                          | Silica based glass ceramics   |   |
| Chemical composition                              | Essential components, solidly incorporated in the network of the glass ceramic material:<br>SiO <sub>2</sub> , Al <sub>2</sub> O <sub>3</sub> , Li <sub>2</sub> O, P <sub>2</sub> O <sub>5</sub> , K <sub>2</sub> O, CaO, B <sub>2</sub> O <sub>3</sub> |   |
| Classification according to DIN EN ISO 6872: 2008 | Type: II  | Classification: 4b  |
| Thermal expansion                                 | DIN EN ISO 6872   | Pressed: $9.8 \times 10^{-6} \times K^{-1}$ (25 - 500° C) |
| Transformation temperature                        | DIN EN ISO 6872   | 535 °C  |
| Bending strength                                  | DIN EN ISO 6872   | 410 MPa   |

To achieve the best results with DCeram conceptPress we recommend to use:

Zubler Disposable Plungers



Investment Material Zubler HS-PC, specially designed for the pressing technique for lithium disilicate glass ceramics.



Zubler Flex Ring System (100g/200g) for pressable ceramics with an ingot size of 13mm.



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