



Celtra® Press  
Directions for use

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THE DENTAL  
SOLUTIONS  
COMPANY™

 Dentsply  
Sirona



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# 1. Purpose

Celtra® Press is a high-strength zirconia-reinforced lithium silicate glass ceramic material that thanks to its translucent and opalescent properties can be used for the fabrication of highly aesthetic all-ceramic restorations by using the hot-pressing technique in dental labs.

The homogeneous, industrially produced ingots are available in three levels of translucency: high translucent (HT), medium translucent (MT) and low translucent (LT). They are pressed in pressing furnaces, using ideally Celtra® Press investment material which does not form surface reaction layer, to obtain tooth-colored, highly aesthetic restorations. Subsequently, the pressed substructures can be stained with Dentsply Sirona Universal Stains & Glaze (for full-contour restorations) and/or veneered with Celtra® Ceram veneering porcelain (for cut-back restorations).

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## 1.1 Technical Data

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Based on the classification of ISO 6872\*, Celtra® Press is a Type II, Class 1-3, zirconia-reinforced lithium silicate (ZLS), dental ceramic substructure material with a CTE of  $9.7 \times 10^{-6} \text{ K}^{-1}$  @ 25-500 °C; and Celtra® Ceram is a Type I, Class I, leucite-reinforced porcelain for coverage of a ceramic substructure with a CTE of  $9.0 \times 10^{-6} \text{ K}^{-1}$  @ 25-500 °C.

\*2015-06

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## 1.2 Product Information

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Celtra® Ceram porcelain is indicated for use as veneering porcelain for Celtra® Press substructure with the same above indications. The restorations can be cemented with conventional adhesive cements.

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## 1.3 Indications for Use

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Celtra® Press is an all-ceramic system for the creation of

- > Occlusal veneers
- > Thin veneers
- > Veneers
- > Inlays
- > Onlays
- > Crowns in the anterior and posterior region
- > 3-unit bridges in the anterior region
- > 3-unit bridges in the premolar region up to the second premolar as the terminal abutment
- > Crown, splinted crown or 3 unit bridge up to the second premolar placed on top of an implant abutment.

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## 1.4 Contraindications

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The following are not indicated for Celtra® Press:

- > Bridges spanning more than three units
- > Temporary restorations. Should not be placed due to unstable temporary cements which could cause fracture of restorations.
- > Parafunction (bruxism)
- > Cantilever bridges
- > Patients with a substantially reduced residual dentition
- > Inlay bridges/Maryland bridges

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### **1.5 Compatible stains/glazes & veneering porcelain**

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Staining and glaze firing is recommended for completing Celtra® Press full-contour restorations. Dentsply Sirona Universal Stains & Glaze can also be used for restorations veneered with Celtra® Ceram porcelain. Celtra® Press restorations are compatible with Dentsply Sirona Universal Stains & Glaze for customizing and glazing (available separately). The use of other stain and glaze systems is not recommended (see Warnings). Use of other stain/glaze porcelain with Celtra® Press is at the discretion and sole responsibility of the dental technician.

Likewise, Celtra® Press substructures are compatible with Celtra® Ceram veneering porcelain (available separately). The use of other veneering porcelain systems which may not have the correct coefficient of thermal expansion

is not recommended (see Warnings). While initial results with some materials may appear acceptable, internal stress can compromise long term success. Use of other veneering porcelain with Celtra® Press is at the discretion and sole responsibility of the dental technician.

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### **1.6 Compatible luting cements**

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Full coverage crown restorations and bridges are compatible with self-adhesive resin cements, including all Dentsply Sirona self-adhesive resin cements (available separately). Inlays and onlays may be cemented with self-adhesive resin cements, however, adhesive bonding is recommended. Alternatively, full crowns and bridges can be cemented with glass-ionomer cement. Use of other cements or cement systems with Celtra® Press is at the discretion and sole responsibility of the dental technician.

## 2. General Safety Notes

Be aware of the following general safety notes and the special safety notes in other sections of these directions for use.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury.

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### 2.1 Warnings

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If properly processed and used, adverse effects of these medical products are highly unlikely. However, reactions of the immune system (such as allergies) or localized paresthesia (such as an irritating taste or irritation of the oral mucosa) cannot be completely ruled out as a matter of principle. In case of skin sensitization or rash, discontinue use and seek medical attention. Celtra® Press restorations are not suitable for patients with clinical symptoms of parafunctional habits or bruxism (see Contraindications). Do not inhale dust particles during grinding. Wear suitable protective mask. Avoid use of thick ceramic pins or third-party auxiliary firing pastes, correction porcelains or stains and glazes. Such use may result in cracking of Celtra® Press restorations. For patients with hypersensitivity to any of the ingredients, this medical device may not be used at all or only under the particular scrutiny of the dentist or physician in charge.

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### 2.2 Precautions

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This product is intended to be used only as specifically outlined in these “Directions for Use”. Any use of this product that is inconsistent with the “Directions for Use” is at the discretion and is the sole responsibility of the practitioner. Wear suitable protective eyewear, clothing and gloves. Protective eyewear is recommended for patients. Contact with saliva, blood and/or some astringent solutions during adhesive procedures may cause failure of the restoration. Use of rubber dam or adequate isolation is recommended. Devices marked “single use” on the labeling is intended for single use only. Discard after use. Do not reuse in other patients in order to prevent cross-contamination. Celtra® Press restorations require adequate preparation reduction (see 3.1 Preparation Guidelines). Insufficient wall thickness may lead to premature failure. Celtra® Press restorations are designed to be polished and/or glazed before insertion. Direct insertion without polishing or glazing may lead to excessive wear on opposing dentition and compromise its esthetics.

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### 2.3 Adverse reactions

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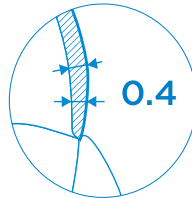
No adverse reactions have been reported for Celtra® Press. When working with these materials, make sure to comply with the Instructions for Use and the pertinent Safety Data Sheets (SDS). If the patient is allergic to any of the ingredients, Celtra® Press restorations should not be used.

# 3. Preparation

## 3.1 Preparation Guidelines

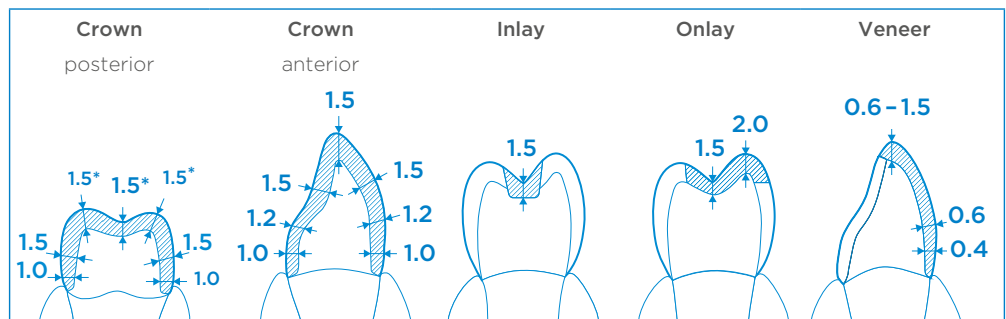
Proper reduction of the hard tissue of the tooth during preparation is essential for maximizing the strength, shade and retention of the finished restoration. When preparing anterior or posterior teeth, the anatomical form has to be reduced as shown below.

Minimum wall thickness: The following diagram shows the specified minimum wall thickness for each indication. The minimum wall thickness must be retained after all manual adjustments have been made.



### Important application precautions

All internal line angles of a preparation should be rounded. Sharp internally prepared angles have to be softened. Sharp line angles have to be rounded to prevent stresses in restoration. Celtra® Press substructure cusp tips and incisal edges must be designed to support the porcelain when veneered.



### 3 unit bridges including 2nd premolar:

Maximum pontic width:

anterior	11 mm
premolar	9 mm

Connectors for 3 unit bridges need a cross section of 16 mm<sup>2</sup>.

> Principle **Height ≥ Width**

### 3.1.1 Ingot types

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The Celtra® Press System offers three different types of opalescent ingots.

- 1 HT ingots** are high translucency ingots and are available in values of I1, I2 and I3. HT ingot can be used for restorations in the incisal region like inlays, onlays and veneers.
- 2 MT ingots** are ingots with a medium translucency and are available in A-D shades. MT ingots can be used for crowns and bridges designed as a full contour restoration. MT ingots can also be used for restoration with a cut-back of the incisal region, pressing and veneering with Celtra® Ceram to complete the esthetic restoration.
- 3 LT ingots** are shaded to Vita® A-D shades in dentin. These are used for veneers or crowns and bridges with a cut-back of the incisal region, pressing and veneering with Celtra® Ceram to complete the esthetic restoration.

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### CELTRA® PRESS shade portfolio

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Restoration type	Translucency		Shade									Individualization technique
<b>Incisal</b> (inlay, onlay, veneer)	<b>HT</b>		I1 I2 I3									<i>Glaze</i>
<b>Full Contour</b> (posterior)	<b>MT</b>	BL2*	A1	A2	A3	B1	B3	C1	C3	D2	D3	<i>Stain &amp; Glaze</i>
<b>Cut-back</b> (anterior)	<b>LT</b>	BL2*	A1	A2	A3	B1	B3	C1	C3	D2	D3	<i>Build-up Stain &amp; Glaze</i>

\* covered by one universal ingots MT/LT BL2

HT ingots are value-based and can be used for restorations in the incisal/enamel region.

#### Shade mapping:

I1: A1, B1, C1

I2: A2, A3, B2, C2, D2

I3: B3, C3, D3, A3.5, A4



### 3.1.2 Inlays and Onlays

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A conventional inlay/onlay design is recommended. Do not prepare undercuts. Ensure that the cavity walls form an angle of 5 to 6 degrees with the long axis of the tooth. Ensure that all sharp edges and angles are rounded. In centric and dynamic occlusion, reduce incisally/occlusally by 1.5 to 2 mm.

Celtra® Press inlays and onlays are ideally delivered by fully adhesive cementing. Alternatively, highly retentive inlay or onlay restorations may be cemented with self-adhesive resin cements.

### 3.1.3 Crowns and bridges

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Ensure that there is an axial reduction of 1.0 to 1.5 mm with the walls form an angle of 5 – 6 degrees with the long axis of the tooth. In centric and dynamic occlusion, reduce incisally/occlusally by 1.5mm. The lingual shoulders must be extended at least 1.0mm into the proximal contacts surfaces. It is recommended to use a shoulder preparation without a bevel: All angles must be rounded, and the preparation surfaces must be smooth.

Given the different masticatory forces, the maximum acceptable pontic width is different in the anterior and posterior region.

The pontic width is determined on the unprepared tooth.

- › In the anterior region (up to the canine), the pontic width should not exceed 11 mm.
- › In the premolar region (canine up to the second premolar), the pontic width should not exceed 9 mm.

Always observe the relation between width and height as well as the suitable dimensions (**min. 16 mm<sup>2</sup>**) when designing the connectors. Basically, the following applies: **Height ≥ Width**.

Celtra® Press crowns and bridges can be delivered by either fully adhesive or self-adhesive cementing.

### 3.1.4 Veneers

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The standard reduction is 0.6 mm for the labial surface and 0.4 mm in the gingival area (since the enamel is thinner in this region). Reduce the labiolingual incisal angle by 0.6 to 1.5 mm. The preparation margins should be located in enamel. A chamfer or rounded-shoulder preparation is recommended for all veneer margins. Proximal extensions must be located far enough proximally to conceal preparation margins from site and to avoid proximal gingival undercuts.

Celtra® Press veneers are delivered by fully adhesive cementing. Self-adhesive cementing is not recommended for veneer restorations.

## 4. Celtra® Press processing

### 4.1 Model preparation (analogue)

Producing a die (using a sealer coating (e.g. Cergo® Sienna) for surface hardening). Apply a die spacer to within 1 mm of the preparation margin line, in two layers (for inlays and

onlays: three layers). The procedure is analogous to that for natural dies. Prepare the master casts as for the fabrication of inlays and crowns made of precious dental alloys.

#### Procedure



- › Establish the preparation margin.
- › Use die hardener on the die.
- › Apply Cergo die spacer Sienna to the die.



- › Apply die spacer in one layer or in two layers as a placeholder for the cementing gap.
- › In the case of crowns, apply die spacer to within 1 mm of the preparation margin on the die.
- › For inlays, apply the die spacer over the entire prepared surface to just short of the preparation margin.



- › The die spacer was designed to simplify individual characterization when fabricating e.g. veneers or inlays.
- › Applying the colored die spacer to the working die optimizes the shade of the final restoration.

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## 4.2 Wax-up

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- › Use only designated **organic pressing waxes** that burn out without residue.
- › Avoid sharp internal edges and (line) angles to reduce tension.
- › Follow the requirements for minimum connector size (cross-sections) and layering thicknesses.
- › Do not over contour preparation margins; create precise margins.
- › The model for the cut-back technique is first waxed up to full contour, as for the staining technique and then cut-back in the incisal third. Maintain the minimum wall thickness (a check with a silicone index is recommended).
- › Do not reduce the occlusal surfaces.



## 4.2.1 Waxing & CAD Considerations

### › Enamel cut-back and/or Dentin/Enamel Layered Technique

This technique offers excellent esthetics. For cut-back, wax a crown/bridge or design a (CAD file) to full contour, and cut-back only the enamel area. This crown/bridge is pressed using one of the dentin ingots (LT) and Celtra® Ceram is then used to complete the build-up. If too much dentin (core material) has been taken away, dentin porcelain can be applied, and then completed with enamel porcelain. (If the core in a specific area is below recommended minimum thickness for the framework, dentin porcelain shall not be applied). For layered technique, the crown/bridge wax-up (or CAD file) are designed based on the preparation geometry, and using the working model.

### 3 unit bridges including 2nd premolar:

Maximum pontic width :

anterior	11 mm
premolar	9 mm

Connectors for 3 unit bridges need a cross section of 16 mm<sup>2</sup>.

### › Principle Height ≥ Width



The all-ceramic substrate must be 50 % larger than the porcelain being applied to it.



› **Full Contour Technique / Staining technique**

This technique is used primarily for the posterior application. The dentin/enamel ingots can be used for waxed or CAD/CAM-designed crowns to full contour and stained and finalized with staining and glazing.

This technique is highly productive and due to the thicker core material the result is a restoration with higher strength. For this application wax the unit or design a (CAD file) to full contour. MT ingots would be used for creating crowns and bridges.



**Celtra Press - minimum framework wall thickness/veneer thickness (mm)**

Technology	Area		Inlays	Onlays/ Tabletop	Veneers	Anterior crowns	Posterior crowns	Anterior bridges	Posterior bridges
								Connector cross-section 16 mm <sup>2</sup>	
Staining technique	Framework wall thickness (fully contoured)	full-arch*	1.0 ≥ Isthmus width	1.5	0.6	1.2	1.5	1.2	1.5
		incisal/occlusal	1.5	1.5	0.6	1.5	1.5	1.5	1.5
Cut-back	Framework wall thickness	full-arch*	-	-	0.6	1.2	1.5	1.2	1.5
		incisal/occlusal	-	-	0.4	0.8	0.8	0.8	0.8
	Veneering (thickness)	-	-	0.4	0.7	0.7	0.7	0.7	
Layering technique	Framework wall thickness	full-arch*/ incisal/occlusal	-	-	-	0.8	0.8	0.8	0.8
		Veneering (thickness)	-	-	-	0.4 - 0.7	0.7	0.7	0.7

\* „full-arch“ refers to the region of the tooth equator.

## 4.2.2 Design

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### 4.2.2.1 Wax-up

- 1 Apply a thin coat of a conventional die lubricant for a wax-up.
- 2 Wax the crown using a conventional inlay wax. Note:

#### Note

Use only non-contaminated inlay wax. After burning out, some inlay waxes may leave ash or carbon residue. This will result in dark areas on the pressed crown.

- 3 Recreate all necessary anatomical features in wax and completely seal the margins.
- 4 For full coverage restorations, be sure the wax or (CAD file) has a minimum thickness of **0.8 mm**. Laminate veneers should have a minimum thickness of 0.4 mm.

### 3 unit bridges including 2nd premolar:

Maximum pontic width :

anterior	11 mm
premolar	9 mm

Connectors for 3 unit bridges need a cross section of 16 mm<sup>2</sup>.

> Principle **Height ≥ Width**

## 4.2.3 Use wax weight to determine the size of ingot use

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### 4.2.2.2 CAD design

- 1 Establish model with CAD/CAM gypsum or alternatively prepare the model with CAD spray.
- 2 When constructing digital restoration to specifications for the cement gap through the menu system while scanning result.
- 3 For full coverage restorations, be sure the wax or (CAD file) has a minimum thickness of **0.8 mm**. Laminate veneers should have a minimum thickness of 0.4 mm

- 1 Weigh the sprue base.
- 2 Use the following table for ingot size selection according table 1.

## 4.2.4 Sprueing

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Weigh the wax-up including the sprues and base as recommended above. Sprues should be ( $\varnothing$  2.5mm - 3.0mm single units or  $\varnothing$  4.0mm [6 gauge] for bridges).

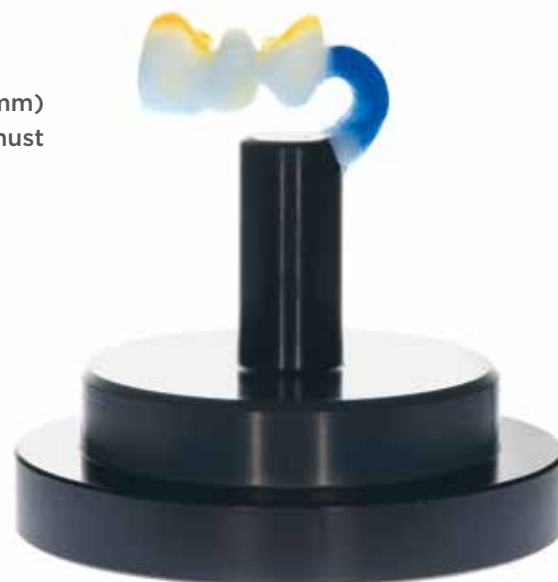
Always attach sprues in the direction of flow and at the thickest point of the object in order to ensure complete pressing.

**Table 1**

Wax Weight	# Ingots	Ingot Size
0.0 - 0.70 g	1	3 g
0.71 - 1.70 g	1	6 g

- > Select the 100 g or 200 g investment ring (use 200 g rings only for bridges).
- > Attach only a single sprue ( $\varnothing$  4.0mm) to bridges (increase pressing temperature by 10 °C to 870 °C)
- > The distance from the silicone ring should be at least 10 mm.
- > The wax-up plus sprue should not exceed 16 mm in length.
- > No short “blind” pressing sprue is required for single objects when using Celtra® Press.

**For 3 unit bridges one sprue ( $\varnothing$  4.0mm) is sufficient. Pressing temperature must be increased by 10 °C to 870 °C.**



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## 4.3 Investing procedures

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### Note

You must use a phosphate-bonded investment for these procedures.

It is recommended to use the Celtra® Press investment. This investment was specially developed for Celtra® Press with the aim to prevent reaction layers from forming during pressing. As a result, it won't be necessary to acid-etch the restoration.



### The following procedure is recommended:

Use no wetting agents, especially not during speed processing. Place the investment ring on the crucible former and mix the Celtra® Press Investment material (following the Instructions for Use) until all objects are completely covered while vibrating slightly to remove all bubbles. Then continue filling without vibration on and check the height and orthogonal position of the investment ring with the help of the ring gauge. Remove excess investment with the ring gauge.



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## 4.4 Pre-heating

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Keep the pre-heating oven clean to avoid residual investment in the muffle channel (while cold, use a vacuum or small broom to clean).

After 20 minutes of setting, remove the investment ring and place it with the opening facing downwards in the pre-heated furnace at 850 °C for 1 hour (200-g ring) or 45 minutes (100-g ring).

**Disposable type investment plungers do not require preheating. We recommend the use of Celtra® Press plungers.**

We recommend placing the investment ring on a firing support or similar with the opening down during heating to avoid contact with the bottom plate of the chamber. (This ensures that the investment ring is heated uniformly and that the wax can run out freely.)

### Caution



During the burnout process, opening the furnace door will generate large flames.

### Note

Do not pre-heat Celtra® Press ingots and/or plungers.



## 4.5 Pressing procedures

Avoid long waiting time between removing investment ring from the burnout furnace and placing into the pressing furnace, to prevent too much cooling of the ring.

### Note

Pay attention to a precise pressing temperature of your press furnace by calibrating these at regular intervals. (Calibration kit Dentsply Sirona)

- 1** Remove a ring from the burnout furnace and place it on a heat-resistant surface with the sprue hole facing up.
- 2** Carefully place the correct size and shade of the ingot into the sprue hole.
- 3** Be aware that Celtra® Press ingots are exactly keyed to the A-D shade guide.
- 4** Do not stack ingots. Use 6 g ingots for a 200 g ring.
- 5** Place plunger it in the sprue hole on top of the ingot.
- 6** Place the ring in the center of the firing platform of the pressing furnace and start pressing procedure according to pressing DFU.
- 7** After the pressing cycle has been completed, remove the ring from the furnace and allow to bench cool. The ring may be fast cooled by placing it in front of a circulating fan.

Up to max 0.7 g wax weight	1 press ingot, 3 g	100 g investment ring
Up to max 1.7 g wax weight	1 press ingot, 6 g	200 g investment ring

### General pressing recommendations

Low temp	Heating rate	Vacuum level	High temp	Hold time	Pressing time	Cool Time	Pressure
700 °C	40 °C/min	45 hPa	860 °C (100 g ring) 865 °C (200 g ring) 870 °C (bridge, 200 g ring)	30 min	3 min	0:00 min	2.7 or 4.5 bar depending on furnace design

### Pressing recommendations Programat EP5000

Stand-by	Heating rate t	High temp T	Hold time H	Stop speed E
700 °C	40 °C/min	860 °C (100 g ring) 865 °C (200 g ring) 870 °C (bridge, 200 g ring)	30 min	250 µm/min

## 4.6 Divesting procedures, Divesting procedures (Investment plunger)

### Note

Do not use pliers or chippers for divesting.

- 1** Indicate the position of the pressed objects using an investment plunger.
- 2** Make a deep cut into the investment compound, preferably using a diamond-covered and sintered large carbide disc or a carbide disc for metal castings.
- 3** Separate the part of the investment ring containing the investment plunger from the rest of the investment ring by turning in opposite directions.
- 4** Use a sand blaster (aluminum oxide 110  $\mu\text{m}$ , max. 2.5 bars or 50  $\mu\text{m}$  glass beads with 3 bars) to remove the investment. Make sure not to touch the objects (abrade the “internal cylinder” and remove the external ring of investment).
- 5** Once the objects have become visible, continue abrading across the area using reduced pressure (1.5 bars).
- 6** Use 50  $\mu\text{m}$  glass beads with 1.5 bars for inlays for ensure the fit.

- › *Using the investment press plunger (Celtra® Press plunger)*
- › *To save time: Trim the investment including the plunger on the wet or dry trimmer.*



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## 4.7 Removing the reaction layer

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If using Celtra® Press investment material, no hydrofluoric acid gel or liquid is required.



Bridge with one 4-mm sprue.

### **Note**

If a reaction layer has been formed, it's an indication of too high pressing temperature. Either calibrate your pressing furnace or reduce the pressing temperature.

## 4.8 Finishing

- 1** Conventional abrasives used for dental porcelains may be used for the Celtra® Press all-ceramic. Use a diamond disk to remove the sprues from the object.
- 2** Do not use carbide burs or coarse grit stones. This will cause a thermal crack and the ceramic coping/crown will have to be remade.
- 3** Use a diamond bur, grinder for glass ceramic material or suitable aluminum oxide stones to re-contour the sprue attached area. Prevent overheating off the pressed unit.
- 4** Closely examine the inside of the restoration for bubbles or irregularities. These can be removed with a thin diamond bur or stone. A cracked restoration can't be repaired by firing porcelain on it and should be discarded.
- 5** Carefully seat the object on the die. Indicating sprays and materials may be used to aid in seating the object. Be sure indicating materials have been completely removed prior to placing the objects in the porcelain furnace.
- 6** Use a porcelain finishing silicone wheel or point to adjust the margins. Other abrasives may chip the pressed ceramic objects and decrease the marginal integrity.
- 7** Grinding with diamond instruments (conventional dental technician hand pieces). Prevent overheating of the restoration. When using turbines, water cooling is recommended.



## 4.9 Composite die procedures

The **Dentsply Sirona Die Material** is designed to mimic the actual shade of the patients prepared tooth. When this material is placed inside the pressed Celtra® crown, it will assist in accurate shade reproductions.



The dentist should take a prep shade of the tooth being restored for the laboratories reference with the Dentsply Sirona Prep Guide.

If the dentist did not take the shade of the prepared tooth, the composite die material guide below may be used to verify the final shade. Select the proper composite die material from the appropriate table.

- 1** Apply the Dentsply Sirona Prosthetics Die Release to the inside of the ceramic restoration and allow it to dry.
- 2** Place a small amount of the Dentsply Sirona composite die material on the inside of the restoration. Pack the material to remove any voids. Immediately push a dowel pin into the uncured composite die material. Remove any excess composite from the margin area.
- 3** Light cure the composite for 1-2 minutes using a hand held light curing unit or the Triad 2000 curing unit from Dentsply Sirona.
- 4** Remove the composite die material from the restoration and carefully clean using a steam cleaner or in distilled water in an ultrasonic cleaner for 10 minutes.

Due to the high translucency of Celtra® Press, the influence of the die shade on the shade of the restoration must be taken into account. The aesthetic result is also influenced by the color of the adhesive material. Using the supplied light-curing die material, the dental technician has the ability to map the shade information supplied by the dentist to a control die to replicate information about the oral situation in the shade reproduction. The aim is to simulate the shade of the prepared tooth (follow the working instructions).

A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
F1	F12	F10	F9	F7	F1	F11	F10	F8	F3	F4	F5	F6	F2	F3	F3

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## 4.10 Build-up, stain and glaze

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### 4.10.1 PowerFire

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PowerFire is a firing program that is carried out before the first ceramic firing of the veneering porcelain. PowerFire increases the flexural strength of the Celtra® Press restoration to >500 MPa. **After PowerFire, blasting must be avoided, since otherwise it'd reduce the strength of the restoration.**

### 4.10.2 Porcelain application

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#### Note

When firing a Celtra® Press All-Ceramic restoration it is important to **use only ceramic/porcelain** type pins/pegs or to place the object directly on the firing pad, to prevent issues with Celtra® Press during porcelain and glaze firings. When other than recommended type of pins/pegs were used, while initial results with some firing pins may appear acceptable, internal stress can compromise long term success. Do not fill the entire restoration with refractory putty. Doing so could cause cracking of restoration.

#### Framework- porcelain ratio standards\*

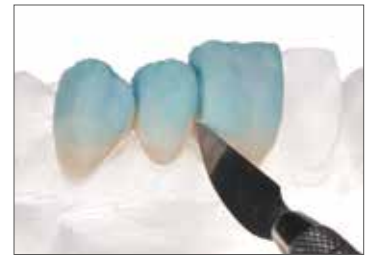
	Veneer			Crowns & Bridges including 2nd premolar						
Overall thickness of restoration (mm)	0.8	1.0	1.1	1.2	1.5	1.7	2.0	2.2	2.4	2.8
Minimum framework thickness (mm)	<b>0.4</b>	<b>0.5</b>	0.6	0.8	0.8	0.9	1.1	1.2	1.3	1.5
Maximum layer porcelain thickness (mm)	<b>0.4</b>	<b>0.5</b>	0.5	0.4	0.7	0.8	0.9	1.0	1.1	1.3

\*the strength of the veneering must not exceed 2.0 mm at any point.

- > The minimum framework wall thickness will always be based on the total thickness of the restoration.
- > The thickness ratio of the framework wall to the ceramic layer must be at least 1:1 to ensure framework stability and esthetics.

### 4.10.3 Dentin and/or Enamel cut-back/ Layered Technique

- 1** Use 50-micron sized aluminum oxide at 20 psi pressure and lightly blast the exterior surface of the crown. Be careful not to harm the margins.
- 2** Use a steam cleaner to clean the surfaces or put the restoration in distilled water and place in an ultrasonic cleaner for 10 minutes. Conclude by performing PowerFire.
- 3** Apply and fire the dentin and/or enamel porcelains to complete the restorations. All the components of the Celtra® Ceram system may be used to enhance the esthetics and contours of the restoration.
- 4** Always use the honeycomb sagger trays with the recommended firing pins. Do not use other types of firing pins.
- 5** The final shade may be checked using the Dentsply Sirona composite die material.
- 6** To glaze the restoration, mix the Dentsply Sirona Overglaze with Dentsply Sirona Stain & Glaze Liquid to desired consistency, if required, and apply onto the porcelain surface. Note the glazing cycle has 2:00 minutes hold time.



#### 4.10.4 Staining/full contour Technique

- 1** Use 50-micron sized aluminum oxide at 20 psi pressure and lightly blast the exterior surface of the crown. Be careful not to harm the margins.
- 2** Use a steam cleaner to clean the surfaces or put the restoration in distilled water and place in an ultrasonic cleaner for 10 minutes.
- 3** Place the pressed crown on the prepared Dentsply Sirona Prosthetics die material.
- 4** Place a small amount of the enamel stain or glaze on the palette. Mix in the Dentsply Sirona Universal Stain and Glaze with the liquid to achieve a creamy viscosity and apply the mixture to the porcelain surface.
- 5** The Celtra® Universal Stains may be used for individual characterizations.
- 6** Remove the die material from the restoration. To ensure proper fit, remove excessive glaze from the interior of the crown as well as the internal margin areas.
- 7** Always use the honeycomb sagger trays with ceramic/porcelain type pins/pegs or place the object directly on the firing pad.
- 8** If necessary, corrections may be made to the crown using Celtra® Ceram Add-On/Correction porcelains.
- 9** Fire the crown using the recommended PowerFire and Glaze firing cycles.



#### Note

If a higher sheen is desirable, either raise the high firing temperature 10 °C or use an additional 30 second hold time at the high temperature.



# 5. General firing recommendation for Celtra® Ceram

## Cut-back: Layered technique

PowerFire - is a heating program to be done to the pressed units prior to layering ceramic. PowerFire increases flexural strength of the Celtra® Press restoration to its maximum >500 MPa.

### 1. PowerFire

Drying	Closing	Start temp	Pre-heating	Heating rate	Final temp	Vacuum start	Vacuum stop	Vacuum time	Hold time*	Cooling**
min	min	°C	min	°C/min	°C			min	min	min
0:00	1:00	400	1:00	55	760	Off	Off	0:00	2:00	0:00

#### Note

After PowerFire blasting must be avoided, otherwise the strength of the restoration will decline.

### 2. First Dentin/Incisal Firing

Drying	Closing	Start temp	Pre-heating	Heating rate	Final temp	Vacuum start	Vacuum stop	Vacuum time	Hold time*	Cooling**
min	min	°C	min	°C/min	°C	°C	°C	min	min	min
2:00	2:00	400	2:00	55	770	400	770	1:00	1:00	5:00

### 3. Second Dentin/Incisal Firing

Drying	Closing	Start temp	Pre-heating	Heating rate	Final temp	Vacuum start	Vacuum stop	Vacuum time	Hold time*	Cooling**
min	min	°C	min	°C/min	°C	°C	°C	min	min	min
2:00	2:00	400	2:00	55	760	400	760	1:00	1:00	5:00

### Glaze firing

Drying	Closing	Start temp	Pre-heating	Heating rate	Final temp	Vacuum start	Vacuum stop	Vacuum time	Hold time*	Cooling**
min	min	°C	min	°C/min	°C			min	min	min
2:00	2:00	400	2:00	55	750	Off	Off	0:00	2:00	0:00

### Add-on (correction) with 1st glaze firing

Drying	Closing	Start temp	Pre-heating	Heating rate	Final Temp	Vacuum Start	Vacuum Stop	Vacuum Time	Hold Time*	Cooling**
min	min	°C	min	°C/min	°C	°C	°C	min	min	min
2:00	2:00	400	2:00	55	760	400	760	1:00	1:00	5:00

### Add-on (correction) after glaze firing

Drying	Closing	Start temp	Pre-heating	Heating rate	Final Temp	Vacuum Start	Vacuum Stop	Vacuum Time	Hold Time*	Cooling**
min	min	°C	min	°C/min	°C	°C	°C	min	min	min
2:00	2:00	400	2:00	55	750	400	750	1:00	1:00	5:00

### Full contour: Staining technique

#### PowerFire & Glaze

Drying	Closing	Pre-heating	Start temp	Heating rate	Final temp	Vacuum Start	Vacuum Stop	Vacuum Time	Hold time*	Cooling**
min	min	min	°C	°C/min	°C				min	min
2:00	2:00	2:00	400	55	1 <sup>st</sup> : 760 °C 2 <sup>nd</sup> : 750 °C	Off	Off	Off	2:00	5:00

- › For this application, the glaze firing may be conducted together with the PowerFire.
- › Firing recommendations for other ceramic furnaces, please visit: [celtra-dentsplysirona.com](http://celtra-dentsplysirona.com)

### Add-on (correction) after glaze firing

Drying	Closing	Start temp	Pre-heating	Heating rate	Final Temp	Vacuum Start	Vacuum Stop	Vacuum Time	Hold Time*	Cooling**
min	min	°C	min	°C/min	°C	°C	°C	min	min	min
2:00	2:00	400	2:00	55	750	400	750	1:00	1:00	5:00

\* Hold time w/o vacuum

\*\* In furnaces that cannot constitute a cooling phase, it is recommended to cool down to 600 °C until removal of the object.

# 6. Cementation

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## 6.1 Preparation of the Celtra® restoration

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- › Clean the restoration with a steam cleaner, in ultrasonic bath or with alcohol.
- › Apply 5% - 9% hydrofluoric acid etching gel (Available separately, see manufacturer's complete Directions for Use) to the interior of the restoration only and allow to soak for 30 seconds.
- › **CAUTION:** Follow manufacturer's precautions. Do not allow tissue or eyes to come into contact with the acid!
- › Remove the hydrofluoric acid as per the manufacturer's instructions.
- › Dry the restoration in an air stream. It is recommended to silanize the etched surfaces immediately.
- › At chairside, apply silane only to those surfaces required for adhesive cementing.
- › Allow to soak for 60 seconds. If the silane layer is no longer liquid, add more silane. Blow-dry in a powerful air stream. (Recommended material: Calibra® Silane Coupling Agent, available separately, see complete Directions for Use).

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## 6.2 Cementing

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Depending on the indication for Celtra® Press restorations a self-adhesive or full-adhesive cementation can be chosen. Compatible time-proven adhesive cementing materials are available as part of the Dentsply Sirona range of products. Alternatively, full crowns and bridges can also be fixed with glass ionomer cement. Cements are available separately.

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	Self-adhesive	Fully adhesive	Glass-ionomer
<b>Inlays</b>	R	HR	-
<b>Onlays</b>	R	HR	-
<b>Veneers</b>	-	HR	-
<b>Crowns</b>	HR	HR	R
<b>Bridges</b>	R	HR	R

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R = recommended

HR = highly recommended

## 7. Troubleshooting Guide

Issue	Recommendation for resolution
1. Cracking of the investment rings due to misalignment of stacked ingots.	<ul style="list-style-type: none"> <li>› Ingots must not be stacked. If insufficient material is a concern, use 6 g instead of 3 g ingot size.</li> </ul>
2. Fins on restorations, while no ring cracking was noted. <b>Reason:</b> incomplete drying of the ring before pressing, powder-liquid ratio for investment is not perfect.	<ul style="list-style-type: none"> <li>› Adhere to drying time of the last ring poured (20 min), if multiple rings are being placed in the burn-out furnace.</li> <li>› Check investment powder-liquid ratio to assure it's correct.</li> </ul>
3. Incomplete investment ring burnout causing cracking of investment ring.	<ul style="list-style-type: none"> <li>› Follow exactly the recommended burn out temperature as stated in the Investment DFUs.</li> </ul>
4. Failure during divesting by using pliers or chipper.	<ul style="list-style-type: none"> <li>› Avoid using chippers or other similar tools during divesting.</li> <li>› Sandblasting only!</li> </ul>
5. Restoration appears too purple and/or transparent, especially in the case of bleach shades. Substantial reaction layer apparent after divesting <b>Reason:</b> The pressing temperature is too high	<ul style="list-style-type: none"> <li>› Calibrating the pressing furnace</li> <li>› The pressing temperature was too high.</li> <li>› Repeat the pressing at the correct temperature ( 860 °C for 100 g ring, 865 °C for 200 g ring; 3-unit bridges: 870 °C for 200 g ring).</li> </ul>
6. Pressed restorations are milky-white, opaque, dead-looking and/or pressing is incomplete.	<ul style="list-style-type: none"> <li>› Check calibration of the furnace.</li> <li>› Pressing temperature is too low.</li> <li>› Either calibrate pressing furnace or validate that the pressing temp. is correct (860 °C for 100 g ring, 865 °C for 200 g ring; 3-unit bridges: 870 °C for 200 g ring).</li> </ul>
7. Cracked restorations after glazing	<ul style="list-style-type: none"> <li>› Do not completely fill restorations with Peg putty</li> <li>› Use only ceramic pins</li> <li>› Make sure restoration have recommended thickness according to DFU</li> </ul>
8. Bullseye swelling at the sprue attachment site	<ul style="list-style-type: none"> <li>› Use a sprue that is wider in one direction while reducing the height of the wax sprue.</li> <li>› See <a href="http://www.celtra-dentsplysirona.com">www.celtra-dentsplysirona.com</a></li> </ul>







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