Celtra® Press
FactFile

Properties of zirconia-reinforced lithium silicate ceramics (ZLS)

What is Celtra Press?

Celtra Press is a press ceramic, available as a pellet in two sizes – 3 g and 6 g. This ceramic material was specially developed for the production of indirect ceramic restorations at the dental laboratory. Celtra Press is characterized by its excellent pressing behavior with all restoration types.

The special power firing step before veneering or glazing will "heal" microscopic faults within the glass matrix caused by sandblasting or finishing and increases the strength in the volume. This ensures the consistently high strength of more than 500 MPa of the material.

The simplified sprueing of bridges, the low viscosity and good flowability of the ceramic material during pressing, and faster divesting/sandblasting steps will shorten the time needed to produce the restorations.

Characteristics

Celtra Press is a multiphase ceramic consisting of a glass matrix and lithium disilicate crystals having a crystal length of about 1.5 µm plus nano-scale lithium phosphate (see the SEM images). In addition to Li_2O and SiO_2, Celtra Press contains about 10% zirconia (ZrO_2), which is dissolved completely in the glass phase as in Celtra Duo rather than in crystalline form.

Celtra Press is characterized by a high strength of about 500 MPa (after power firing) and excellent flow properties during pressing. In conjunction with the newly developed investment, only a minimal reaction layer is formed, resulting in an excellent fit and shortening the time needed for finishing, because the surface etching step is eliminated.

Celtra Press is easy to polish, should minor corrections in the patient's mouth turn out to be necessary. Though no post-processing in the laboratory is required and excellent esthetics is nevertheless ensured.

Technical specifications for Celtra® Press

CTE (25–500°C):	9,7 *10^{-6} K^{-1}
Softening Point Sp:	820°C
Glass-transition temperature Tg:	560°C
Flexural strength after power firing:	>500MPa
Chemical solubility:	<30 µg/cm^2

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Cementing using the Celtra® cementation system

Depending on the indication, Celtra Press restorations may be cemented self-adhesively, fully adhesively, or (in the case of crowns) with glass-ionomer cement. Compatible time-proven adhesive cementing materials are available as part of the Dentsply Sirona range of products. Cements are available separately.

	Self-adhesive	Fully adhesive	Glass-ionomer
Inlays	R	HR	–
Onlays	R	HR	–
Crowns	HR	HR	R
Veneers	–	HR	–
Bridges	HR	HR	R

R = recommended
HR = highly recommended

Esthetic properties

Celtra Press is available in selected VITA shades that can be used to produce almost any restoration. The individual pellets are assigned either to the HT (high translucency), the MT (medium translucency), or the LT (low translucency) groups, intended for different indications:

1. **HT ingots** are high translucency ingots and are available in values of I1, I2 and I3. HT ingots 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 been 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.

The shades of Celtra Press are adapted to the VITA dentin shades. Thanks to the opalescent properties of Celtra Press ceramics, the incisal-edge or cusp regions will appear very natural even in the case of restorations that have been pressed to full anatomic contour.

Celtra Press is fluorescent; the intensity of the fluorescence may be enhanced by using the system's fluorescent glaze.

Celtra stains can be used to individually characterize any restoration.

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In-vitro studies

Chewing simulation studies and aging tests conducted by the universities of Heidelberg and Regensburg as well as company-internal studies have shown that the performance of Celtra Press is at least as good as that of existing lithium disilicate (LS_2) pressable ceramics.

In-vitro studies on the wear behavior of Celtra Press and enamel-like antagonist have shown that the abrasion of Celtra Press and existing LS_2 pressable ceramics has the same order of magnitude as that of natural tooth enamel.

Shade philosophy

SMART SHADE SYSTEM

Celtra Press ingot portfolio

Type of restoration	Translucency	Shade							Individualization technique
Incisal (inlay, onlay, veneer)	**HT**			I1	I2	I3			Glaze
Full Contour (posterior)	**MT**	BL2*	A1	A2	A3	B1	C1	D2	Stain & Glaze
Cut-back (anterior)	**LT**	BL2*	A1	A2	A3	B1	C1	D2	Build-up Stain & Glaze

* coming soon

The three different translucency levels of Celtra Press (HT, MT, and LT) have been defined such that a true translucency gradient is obtained throughout for all shades within a translucency class. The chart (next page) shows relative translucency as a function of translucency classes and the A series of shades. While in conventional LS_2 glass ceramics, translucencies are not uniform (for example, MT can be more opaque than LT and, for example, A3 HT less translucent than A3 LT), Celtra Press possesses a consistent translucency gradient that is independent of the selected shade within the VITA A group.

The second chart (next page) shows the classification of all levels of translucency and associated shades compared to conventional LS_2 glass ceramics and an enamel of the Duceram Kiss range (S3) and one dentin of the Duceram Kiss range (DA3). Within a shade group (e.g. VITA A), translucency decreases (e.g. A1 MT to A3) but always keeps the same distance in terms of translucency from to the next, less translucent shade group (A1 LT to A3 LT). This makes it easier for the dental technician to benefit from experience gained within one shade group to one of the other shade groups (e.g., from the A group to the B, C, or D group). Decreasing translucency within a shade group (e.g. VITA A) is caused by the higher chroma, as in natural teeth in an age-related series.

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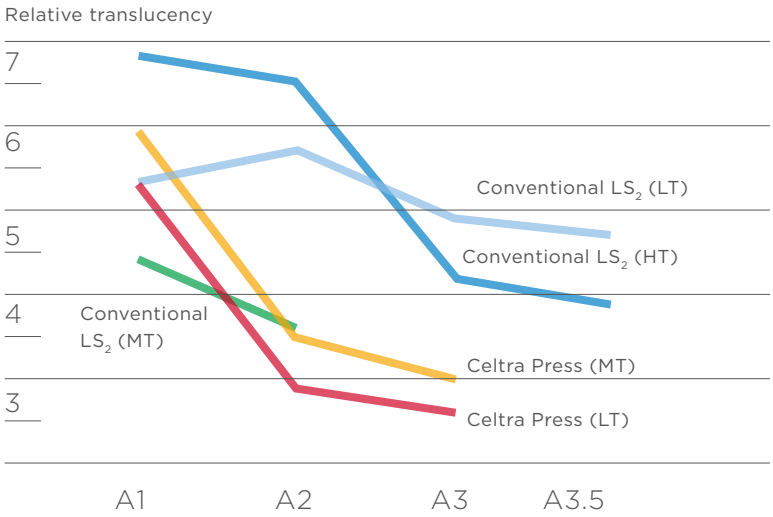
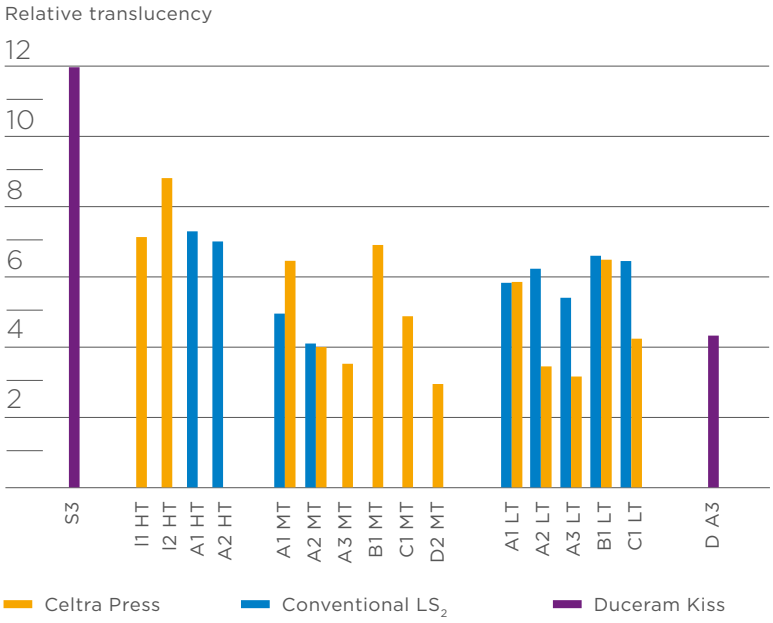
LIGHT TRANSMISSION
L [%]





This conventional Lithium Disilicate ceramic material (HT & LT) is not consistent in the nomenclature regarding translucency.

Also a too high translucency without enough opacity results in a greying effect in the mouth

Microstructures

The first pair of images shows the pellets of Celtra Press and a conventional LS2 glass-ceramic material.

The scanning electron microscope (SEM) images show the microstructural differences of zirconia-reinforced glass ceramics compared to conventional glass ceramics. This pair of images shows the crystal size of the lithium disilicate within the pellet, as delivered. It can be clearly seen that the crystals in the Celtra Press pellet are smaller, which results in better compressibility and flowability (lower viscosity) during the pressing process. This means that it is easier to press thin-walled sections of the restoration without needing a lot of sprues.

The final pair of images shows the crystallite size of lithium disilicate in the final restoration. Here, too, smaller crystalline structure of Celtra Press is obvious, which facilitates simpler and faster polishing.

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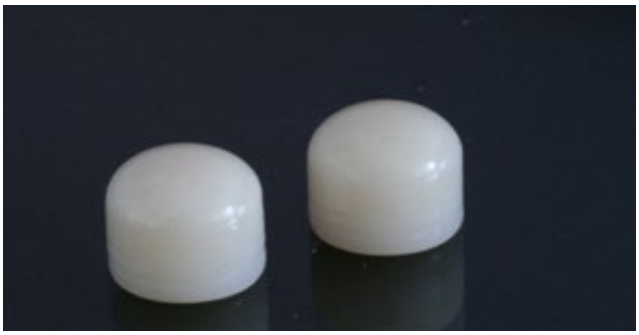
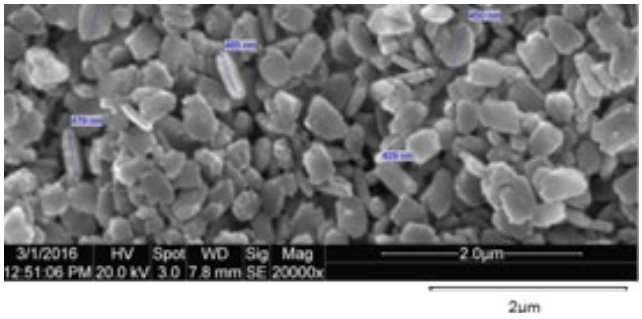
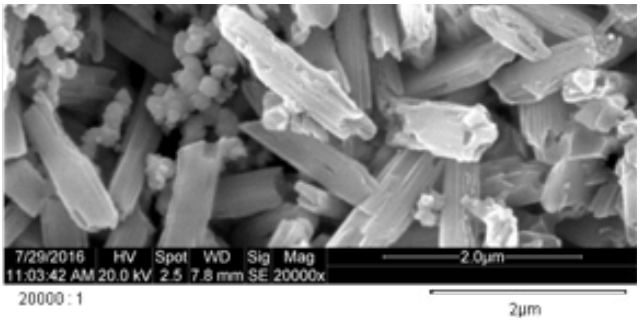


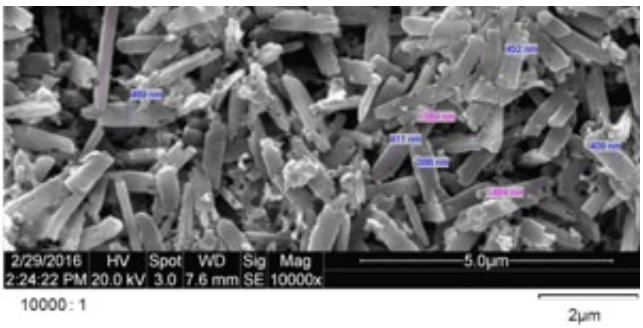
Conventional LS_2 glass ceramic

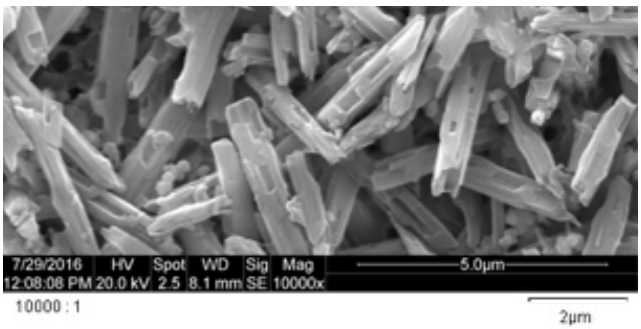
Ingot





Ingot microstructure





Final restoration microstructure

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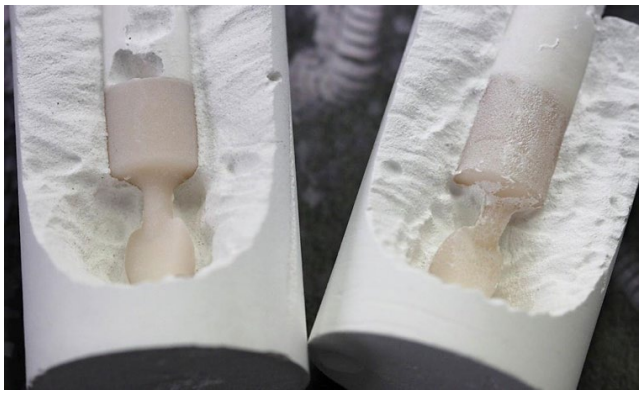
Celtra® Press Investment

The Celtra Press investment specially developed for Celtra Press minimizes the formation of a hard reaction layer between the investment and the pressed restoration. Along with then lower pressing temperature of Celtra Press compared to conventional LS_2 glass ceramics (50–60°C), the Celtra Press Investment and Celtra Press pair eliminates the need to use cleaning fluid containing hydrofluoric acid. Any reaction layer residue that still exists can easily be removed by sandblasting, not least because the hardness of the reaction layer is greatly reduced by the lower pressing temperature and thanks to the special investment.



The left sample illustrates the divesting of Celtra Press from the Celtra Press Investment by mere sandblasting; no reaction layer is discernible. The right sample shows the corresponding situation when conventional lithium disilicate pressable ceramics are used; here, too, only sandblasting was used. Residues of the reaction layer are clearly visible.

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Dentsply Sirona Celtra Ceram

Description

Celtra Ceram is a ceramic veneering material for all-ceramic frameworks, a low-fusing, leucite-reinforced feldspathic ceramic material optimized for veneering and characterizing Celtra Press zirconia-reinforced lithium silicate (ZLS) frameworks produced using heat-pressing technology. With a CTE 25–500 °C of 9.0 × 10^{-6} K^{-1} and a firing temperature of 770°C (1st dentine firing) Celtra Ceram is also suitable for lithium disilicate frameworks.

Benefits

Primary

- Comprehensive veneering porcelain system optimized for bonding to Celtra Press and lithium disilicate substructures, eliminating the need for wash firing
- Exceptional performance derived from proprietary feldspathic base formulation that delivers an incredibly stable and robust result – every time, even after multiple firings
- Shade confidence with out-of-the-bottle shade accuracy

Secondary

- Color-coding (organic pigments) of different types of porcelain provides dental technicians the convenience of identifying/distinguishing each layer of porcelain during build-up
- Optimized particle size distribution of dentin/enamel porcelain facilitates the wetting with modeling liquid for smooth application and seamless build-up
- Correction/Add-on can be applied and fired simultaneously with glaze/stain porcelain, or after glaze/stain firing.

Indications

- Celtra Press zirconia-reinforced lithium silicate (ZLS) frameworks: CTE (25–500°C): 9,7 × 10^{-6} K^{-1}
- Lithium disilicate frameworks: CTE (100–500°C): 10.5 × 10^{-6} K^{-1}

Physical properties

CTE (25–500°C): 9 × 10^{-6} K^{-1}. Firing temperature: 770°C (1^{st} dentin firing)

Flexural strength (three-point bending test): 108 N/mm^2. Vickers hardness: 5000 N/mm^2. Chemical solubility: 28 µg/cm^2.

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