

SNF
PressCeramTM
Z I R C O N I A

**Press - To - Zirconia
Layer - To - Zirconia**



INSTRUCTION MANUAL



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SNF PRESSCERAM™ - ZIRCONIA INSTRUCTIONS



The System



The SNF PressCeram™ - Zirconia is a low fusing (780°C) dental ceramic sinter material, used for the production of crowns and bridges made of Zirconium Oxide (ZrO₂) based frameworks. The newly developed chemical composition of the primary materials, their structure and particle distribution, guarantees an easy, straightforward and safe application without a lengthy cooling process. The SNF PressCeram™ - Z layering ceramic is available in a wide range of shades according to the Vita® shade system. Also, combining translucence and opalescence allows for aesthetic, high-quality, natural-looking results.

The SNF PressCeram™ -Z ingots are dual-phased glass ceramic. They have a high density and low-wear to opposing dentition. All ingots are used with the Stain & Glaze Technique, the Layering Technique, or both. The ingots are fluorescent and opalescent and most are available in 5g along with the standard 2g size. Some ingot shades are also available in different levels of opacity.

The Material

The SNF PressCeram™ - Zirconia dental ceramic system is a complete new development within the SNF PressCeram™ product family. This complex, four-year development finally resulted in a system that has outstanding compatibility with Zirconium Oxide (ZrO₂) frameworks.



The Scanning Electron Microscope (SEM) enables detailed views of the bonding properties of materials. The complex microstructure of the press ceramic material and the layering ceramic material shows complete homogeneity. The interface area between the Liner and the Zirconium Oxide is of particular importance. By designing the porcelain to be leucite-free, pressing and/or layering has created advanced mechanical properties.

Physical Properties

The ideally matched stable coefficient of thermal expansion (CTE) ensures trouble-free processing of the pressing and layering technique, even after multiple firings. The three-point flexural strength is well above the required standard value. The materials also feature very good chemical resistance and high biocompatibility.

	CTE (25-500°C)	Chem. Solubility Ceramic ISO 6872		3-Point Flexural Strength Ceramic ISO 6872	
Liner	9.8	≤ 20	< 100	≥ 80	> 50
Porcelain	9.2	≤ 25	< 100	≥ 90	> 50
Glaze	7.1	≤ 50	< 100	NA	> 50
Ingot	9.5	≤ 20	< 100	≥ 100	> 50

Indications

The SNF PressCeram™-Z system is designed for Press-To-Zirconium. It is ideal for: Single Crowns, Short & Long-span Bridges, Maryland and Inlay Bridges. Ingots can also be pressed without using a Zirconium substructure. This makes combination cases possible. Although there are great advantages to Press-To-Zirconium, the SNF PressCeram™-Z porcelain can also be used exclusively as a layering porcelain.



Ingots & Porcelain

The newly developed material composition exhibits a discreet opalescence and fluorescence. The material has a higher light scattering effect and brightness, which results in a natural light dynamic. Once the restoration is complete, a life-like and esthetical brilliant result can be achieved. For individual characterizations, the SNF PressCeram™-Z system offer materials in an extensive range of different shades and opacities with matching fluorescence. This basic range is completed with a wide palette of special powders. A high degree of shade consistency and shade brilliance is assured after multiple firings.

The following are the available porcelains and ingots available in the SNF PressCeram - Zirconia system:

OPACIOUS DENTIN:

A0, A1, A2, A3, A3.5, A4, B0, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3

DENTIN:

A0, A1, A2, A3, A3.5, A4, B0, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3

INCISAL:

INCISAL 1 to 4, NEUTRAL, CLEAR, OPAL LIGHT, OPAL EXTRA LIGHT, OPAL MEDIUM, OPAL STRONG

TRANSLUCENT:

TL ORANGE, TL BROWN, TL GREY, TL GREY/BLUE, TL LIGHT BLUE, TL BLUE, TL INTENSIVE BLUE, TL WHITE, TL NECK ORANGE, TL NECK YELLOW

MARGIN:

A0, A1, A2, A3, A3.5, B0, B1, B2, B3, C1, C2, C3, B0, B1, B2, B3, C1, C2, C3, D2, D3

LINERS:

LINER NEUTRAL, LINER 1, LINER 2, LINER 3, LINER 4, LINER 5

MODIFIER:

CHROMA A, CHROMA, B, CHROMA C, CHROMA D, WHITE, GINGIVAL 1, GINGIVAL 2, CORRECTION DENTIN, CORRECTION INCISAL

INGOTS:

A00, A0, A1, A2, A3, B0, B1, B2, B3, C0, C1, C2, D0, D2, D3, S00, S0, S1, S2, S3, S4, PS10 (2g)

A00₅₀, A0₅₀, A1₅₀, B0₅₀, D2₅₀, S00₅₀, S0₅₀, S1₅₀, (2g - Higher Opacity)

A0, A1, A2, B0, B1, S00, S0, S1 (5g)

Preparing The Framework

Be sure to follow the manufacturer's instructions when preparing the ZrO₂ framework.



The Liner

Liner is NOT necessary and will not affect the bonding properties of the porcelain to Zirconium. The Liner is a great tool to assist the technician with achieving the proper shade of a restoration. Most Zirconium frameworks have a shade which is infiltrated in the core, and thus do not require the use of a Liner. However, if the Zirconium framework is stark white, use the Liner for its masking properties. By applying the proper Liner (see Shade Combination Table), achieving a particular shade will become easier.



To apply the Liner, mix the Liner Powder with the Modelling Liquid until a paste-like consistency is achieved. Apply the Liner with a brush to a clean Zirconium Framework. Fire the Liner using the Firing Guidelines. Repeat process if coverage is insufficient or uneven.

Full Contour Wax-up

Be sure to record the WEIGHT of the Zirconium Framework before applying wax. The recorded weight will be crucial in determining the number of ingots required for a successful press. Wax to full-contour using ash-free waxes. Wax thickness should be no less than 0.8mm.



Sprue Design & Placement



For Singles: Attach an 8 gauge wax sprue to the wax pattern (A sprue 3-5 mm is recommended). While anteriors should be sprued at the incisal edge, single posterior units should be sprued at the thickest waxed cusp. For larger posterior units, it is recommend that you attach a secondary sprue, from the primary sprue to the opposing cusp. Be sure that the sprues exhibit uniform directional flow. Mis-presses can be avoided by eliminating sharp/abrupt directional changes. Single restorations should be sprued at a 45-60 degree angle to the sprue base. When spruing single units, be

sure that there is a minimum of 3mm space between each restoration. The sprued restorations should be at least 10mm away from the ring former wall. For Bridges: Attach 6 gauge sprues to the incisal/occlusal surface of the waxed frame. Be sure that a separate sprue is attached to each unit. For longer span bridges, be sure that secondary sprues are attached to the lingual. This will avoid short/mis-presses. Exhibit the same spacing requirements as listed above in the single restoration guidelines.



Ingot Requirements

Record the weight of the waxed framework (with sprues). Subtract this weight with the weight of the framework to arrive at the total wax weight. Refer to the chart to determine the ingot size, number of ingots and ring size to use when pressing. If pressing the 5g ingots, be sure that you have the proper 5g plunger and ring former plunger base.

Wax Weight	Ingot Amt.	Ingot Size	Ring Size
0.1 - 0.5g	1	2g	100g
0.6 - 1.1g	2	2g	200g
1.2 - 1.4g	1	5g	200g
1.5 - 1.9g	1 & 1	2g & 5g	300g
2.0 - 2.8g	2	5g	300g



For wax weights that are 0.25g or less, it is suggested that a phantom sprue be used. The phantom sprue should be placed on the plunger base with a height equal to the sprued restoration.

Investing Wax-up

Use an investment that is suitable for pressable ceramics. Follow the manufacturer's bench setting guidelines. It is recommended to follow the manufacturer's instructions with regards to liquid/water ratios.



Burnout Method

After the proper amount of bench setting time, place the ring into a clean burnout furnace. Make sure the ring is lying on its side at a 45 degree angle. This will ensure an optimal burnout. If using reusable ALOX plungers, be sure to place the plunger in the burnout furnace as well.

DO NOT PREHEAT THE INGOTS.

Ring Size	Temperatures	Soak Time
100g	850°C / 1562°F	40 min.
200g	850°C / 1562°F	50 min.
300g	850°C / 1562°F	60 min.

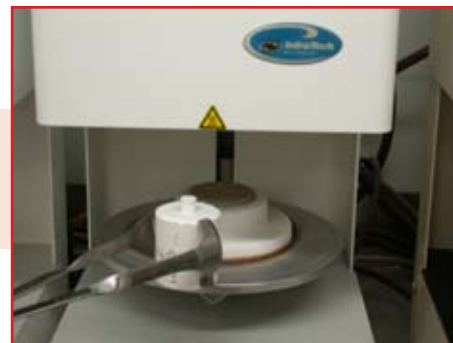


Pressing Procedure

Once the burnout time has expired, take the ring out of the burnout furnace and place the room temperature ingot(s) into the ring. Place the plunger on top of the ingots in the ring and transfer the ring into the pressing furnace. It is crucial that this stage be executed as fast as possible, since the temperature of the ring decreases very quickly. The greater the distance from the burnout furnace to the pressing furnace, the longer the hold time should be. Follow the pressing guidelines to press.

Base Temp	Heat Rate	High Temp	Hold Time	Press Time	Vac. Start	Vac. End
°C/°F	Deg./min.	°C/°F	minutes	minutes	°C/°F	°C/°F
700	60	900	20 - 25	8 - 12	700	900
1292	140	1652	20 - 25	8 - 12	1292	1652

These pressing temperatures are only guidelines. Temperatures may be different depending on the furnace used. Please adjust the parameters as needed.



Divesting

All rings must be cooled at room temperature before starting to divest. Using a fan or suction unit may help the ring cool faster; however do NOT quench the ring. Mark the length of the plunger using a pencil on the outside of the ring. Following the marked line, use a large diamond separating disc to cut the plunger away from the ring. At the button end of the ring, start sandblasting at 4-bar (60psi) pressure using 110-micron glass beads. Once the restorations are exposed, sandblast the remaining investment at 2-bar (30psi) pressure. Remove the sprue and button using water with a diamond separator disc. Fit the restoration on the model.



Stain & Glaze Technique

Contour the pressed restoration with diamond instruments. Steam clean the restoration thoroughly. Mix the Glaze Powder and Glaze Liquid to achieve a thick, honey-like consistency. Apply a thin layer of glaze to the restoration to start. This will assist the stain to stay in place. Apply stains where needed and use the 'Stain Fixation Bake - Core' parameter. Repeat if necessary. Once the proper shade has been achieved, apply the mixed glaze medium to the entire restoration and use the 'Core Stain & Glaze' firing parameter.



Cut-back & Layering Technique

Cut-back the restoration using burs and/or stones indicated for ceramics. Avoid overheating the ceramic by using water at a low speed. Be sure not to cut-back more than 40% of the original core. Once the cut-back is complete, sandblast at 2-bar (30psi) followed by steam cleaning. Layering Porcelain should be applied using the Modelling Liquid. Apply the porcelain and fire each layer using the Firing Guidelines. Once ready to Glaze, mix the Glaze Powder and Glaze Liquid to achieve a thick, honey-like consistency. Apply a thin layer of glaze to the restoration to start. This will assist the stain to stay in place. Apply stains where needed and use the 'Stain Fixation Bake - Layered' parameter. Repeat if necessary. Once the proper shade has been achieved, apply the mixed glaze medium to the entire restoration and use the 'Layered Stain & Glaze' firing parameter.



Layering Porcelain without Pressing

The Liner: Due to the high opacity level of Zirconium Oxide substructures, the Liner will help to reduce the white-effect and therefore make it easier to achieve an accurate hue and chroma. Refer to the 'Shade Combination Table' for the recommended Liner shade. Mix the Liner-powder and the Liquid L to a creamy consistency. Apply the Liner layer onto the clean framework with a brush until an optimal coverage of the framework has been attained. After the Liner application, place the crown/bridge on a firing tray and fire according to the Firing Guidelines Chart. This process can be repeated should the Zirconium framework surface not be fired evenly or entirely covered.

Margin Application: Apply a thin layer of margin separator liquid to the shoulder of the die. Mix margin ceramic powder with modelling liquid 2 to a creamy consistency. Apply mixed margin ceramic in small portions and condense with slow vibration. BLOT ONLY. Remove excess liquid and dry well yet at the same time keep the material moist. After margin application, bake according to the Firing Guidelines Chart. After the first Margin firing, place the restoration on the die and trim excess. Apply second margin layer as required to optimize fit.

Dentin / Incisal Build-up: Advisory Notice: With each layer of SNFPressCeram™-Z porcelain, do not exceed 2.4mm in thickness. Be sure to build-up dentin/incisal porcelain no more than 1mm per bake. Keep the powder moist before the bake, otherwise, it will lift-off. Fire Dentin/Incisal according to the Firing Guidelines Chart.

Stain & Glaze: Use SNFPressCeram™ Stains and Glaze to finish the restoration. Fire Stains and Glaze according to the Firing Guidelines Chart.

Firing Guidelines

Cut-back the restoration using burs and/or stones indicated for ceramics. Avoid overheating the ceramic by using water at a low speed. Be sure not to cut-back more than 40% of the original core. Once the cut-back is complete, sandblast at 2-bar (30psi) followed by steam cleaning.

Parameters	Dry Time	Start Temp	Heat Rate	High Temp	Hold	Vac Start	Vac End
Units	min	°C/°F	deg/min	°C/°F	min	°C/°F	°C/°F
Liner	4	400 / 752	60 / 140	960 / 1760	1	400 / 752	1758
Staining Technique:							
Stain Fixation	3	400 / 752	55 / 131	720 / 1328	0	NO	NO
Stain & Glaze	5	400 / 752	50 / 122	800 / 1472	1	NO	NO
Layering Technique:							
1st Margin	4	400 / 752	60 / 140	820 / 1508	1	400 / 752	819 / 1506
2nd Margin	4	400 / 752	45 / 113	810 / 1490	1	400 / 752	809 / 1488
1st Dentin/Incisal	4	400 / 752	45 / 113	780 / 1436	1	400 / 752	779 / 1434
2nd Dentin/Incisal	4	400 / 752	45 / 113	770 / 1418	1	400 / 752	769 / 1416
Stain Fixation	3	400 / 752	55 / 131	640 / 1184	0	400 / 752	639 / 1182
Stain & Glaze	4	400 / 752	45 / 113	760 / 1400	1	400 / 752	759 / 1398
Add-on/Correction	4	400 / 752	45 / 113	730 / 1346	1	400 / 752	729 / 1344

** The given temperatures are approximate values. Depending on the furnace, corrections of the firing temperatures may be required.*

Shade Combination Table

Shade	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Liner	1	2	2	2	4	1	1	2	2	1	3	3	4	1	5	5
Dentin	A1	A2	A3	A3.5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
Incisal	1	2	2	4	4	1	2	3	4	2	2	3	4	1	2	3

*For bleach shades Liner N, A0 & B0 Dentin, Incisal Neutral and TL-White are available.

Safety Notes

Use the Provincial Guide (OSHA or similar) when grinding and polishing dental prosthetics. Use safety cautions such as well-ventilated rooms, suction devices, facemasks and safety glasses. Swiss NF Metals, Inc. is committed to safety and quality and is registered as an ISO 13485:2003 company.

Acknowledgements

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