

HS10PC

SDCeram

Instruction for use



Всего 214/2021

1



ООО «ДИАМЕД»

Адрес: Россия, Санкт-Петербург, Басков переулок 17, литер А, пом. 2Н

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HS10PC Content

SD *Ceram*

	Page		Page		Page
Indication, Contraindication	3	Modeling-Stain Technic (Full Contour)	16	Firing Chart	32
Preparation Guideline	4	Modeling (Cut-Back)	17	Technical Data	33
Wax Up Layering (Framework)	5	Modeling Layering	18	Regulatory Information	34
Wax Up Layering (Cut-Back)	6	Dentine/Incisal Bake (zirkon)	19	Warnings, Label Symbols, Manufacturer Information	35
Wax Up Stain Technic (Full Contour)	7	Glaze Finish/Glaze Firing	20		
Wax Up Stain Technic (Inlay)	8	Modeling «nature» (zirkon)	21		
Sprueing	9	Modeling «individual» (zirkon)	22		
Determine wax weight	10	Coloured Modeling Liquids	23		
Investing	11	zirkon Correction Bake	24		
Preheating	12	shade & stains LFU	25 -28		
Press	13	Combination Table	29		
Devesting	14	Correlation Table	30		
Finishing	15	Press Programmes	31		



Issue 04/2021

2



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Indication

HS10PC pressable ingots base on a high strength glass ceramic. Colouration was made on the base of VITA®* classical shades (SL, SLM, LT, HT, MT translucency) and in special shades (L, L+, MO and S translucency & Bleach) or opalescence colours.

HS10PC is intended for dental applications and for use by trained professionals.

Mechanical strength and optical properties qualify HS10PC to press all ceramic single unit restorations (anterior and molar crowns, veneers, inlays, partial crowns/onlays) and three unit anterior bridges, three unit praemolar bridges including second praemolar as terminal post. Follow the instructions for minimum wall thicknesses and connector cross sections as mentioned.

Pressed objects may be completed in layering or staining technique with zirkon layering porcelain and shades & stains LFU and glaze LFU.

Contraindication

- Combination with materials beside the mentioned products and/or external products.
- Manufacturing of non-mentioned restorations.
- Manufacturing of restorations with reduced wall thicknesses and connectors cross sections as recommended.
- Dental ceramic and complete ceramic restorations made of HS10PC are not recommended for patients with bruxism or parafunction or patients with substantially reduced residual dentition.



*VITA is a registered trade mark of the VITA- Zahnfabrik, Bad Säckingen



HS10PC Preparation Guideline **SD** *Ceram*

The preparation of the tooth structure follows the common rules for all ceramic restorations:

- Preparation of a deep chamfer or shoulder with rounded inner edge
- All edges and angles have to be rounded out.
- Preparation of retentive surfaces and sufficient preparation height for conventional cementation

Minimum wall thickness (in mm) for the indicated restorations, finishing techniques and connector cross sections (in mm²) are given in the following table:

		Veneer	Inlay	Onlay	Crowns		Three-unit bridges	
					Anterior	Molar	Anterior	Praemolar
Staining	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
Cut-back	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	circular	--	--	--	0.6	0.8	0.8	0.8
	incisal/occlusal	--	--	--	0.6	0.8	0.8	0.8
	in principle	--	--	--	anatomically reduced tooth shape			
	connector cross section	--	--	--	--	--	16	16
	max. pontic width	--	--	--	--	--	11	9

Please Note: 50% of the total restoration dimension must be made in high strength pressable ceramic! In case of excess space always compensate the dimensions in high strength pressable ceramic HS10PC and not in layering porcelain.



HS10PC Wax Up - Layering (Framework)

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Wax framework (for full zirkon layering)

Wax framework for the zirkon layering (dentine und incisal)
Usable ingots: L, L+, MO



Model preparation

Prepare a segmented plaster working model as usual.
Depending on the dentists preparation spacer application to the plaster model is recommended in one or two layers:
For partial crowns, crowns and veneers, apply two layers up to 1 mm apical of the preparation margin.
For Inlays and Onlays apply two layers to the walls and three layers to the bottom, up to 1mm distance to the preparation margin.

Wax up

The objects are contoured in wax that burns without residues. Contour according desired finishing technique. Consider anatomical form and functional detail of occlusal surfaces. Avoid overcontouring, especially in the marginal area.
Always respect minimum wall thickness and the right proportion between press ceramic and layering ceramic.
For cut-back and layering technique create reduced anatomical forms and avoid sharp edges or tips.



HS10PC

Wax Up - Layering

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Wax framework (for incisal layering)

Wax framework cut-back for zirkon layering (incisal)
Usable ingots: SL, SLBL, SLBLT, SLM, LT, MT, HT



Model preparation

Prepare a segmented plaster working model as usual.
Depending on the dentists preparation spacer application to the plaster model is recommended in one or two layers:
For partial crowns, crowns and veneers, apply two layers up to 1 mm apical of the preparation margin.
For Inlays and Onlays apply two layers to the walls and three layers to the bottom, up to 1mm distance to the preparation margin.

Wax up

The objects are contoured in wax that burns without residues. Contour according to desired finishing technique. Consider anatomical form and functional detail of occlusal surfaces. Avoid overcontouring, especially in the marginal area. Always respect minimum wall thickness and the right proportion between press ceramic and layering ceramic. For cut-back and layering technique create reduced anatomical forms and avoid sharp edges or tips.



HS10PC Wax Up - Stain

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Technic (Full Contour)



Wax framework (for stain technic)

Wax framework full contour for stain technic (glaze, shades, stains LFU)
Usable ingots: SL, SLBL, SLBLT, SLM, LT, MT, HT



Model preparation

Prepare a segmented plaster working model as usual.

Depending on the dentists preparation spacer application to the plaster model is recommended.

For partial crowns, crowns and veneers, apply two layers up to 1 mm apical of the preparation margin.

For Inlays and Onlays apply two layers to the walls and three layers to the bottom, up to 1mm distance to the preparation margin.

Wax up

The objects are contoured in wax that burns without residues. Contour according desired finishing technique. Consider anatomical form and functional detail of occlusal surfaces. Avoid overcontouring, especially in the marginal area. Always respect minimum wall thickness and the right proportion between press ceramic and layering ceramic.

For cut-back and layering technique create reduced anatomical forms and avoid sharp edges or tips.



HS10PC Wax Up - Stain

SD Ceram

Technic (Inlay)



Wax inlay (for stain technic)

Wax inlay for stain technic (glaze, shades, stains LFU)
Usable ingots: S, HT, Impulse, SLETC



Model preparation

Prepare a segmented plaster working model as usual.

Depending on the dentists preparation, spacer application to the plaster model is recommended.

For partial crowns, crowns and veneers, apply two layers up to 1 mm apical of the preparation margin.

For Inlays and Onlays apply two layers to the walls and three layers to the bottom, up to 1mm distance to the preparation margin.

Wax up

The objects are contoured in wax that burns without residues. Contour according desired finishing technique. Consider anatomical form and functional detail of occlusal surfaces. Avoid overcontouring, especially in the marginal area.

Always respect minimum wall thickness and the right proportion between press ceramic and layering ceramic.

For cut-back and layering technique create reduced anatomical forms and avoid sharp edges or tips.



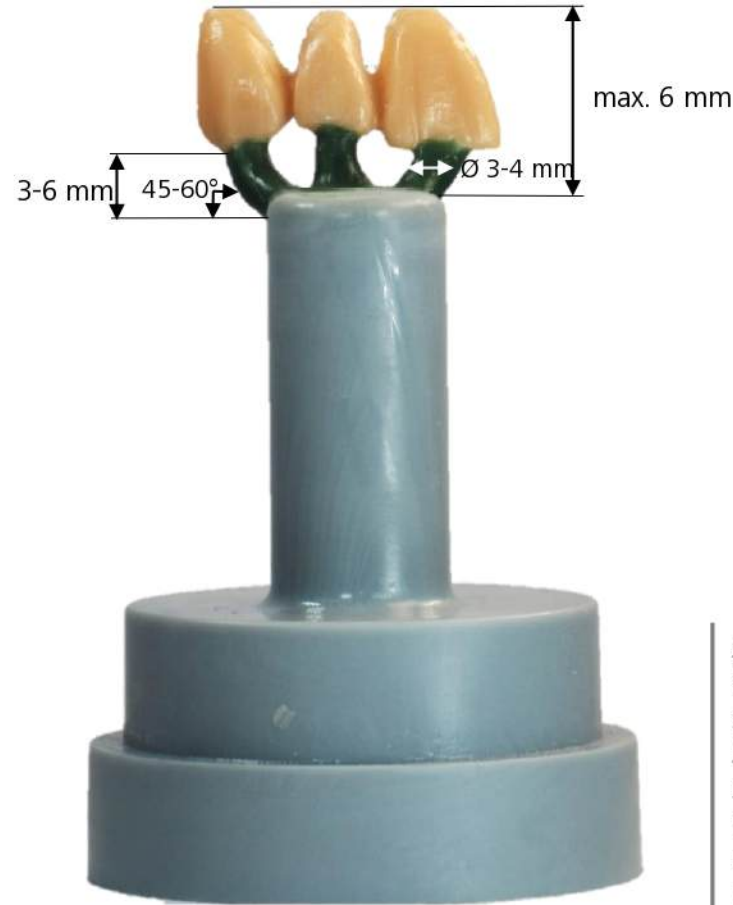
HS10PC Sprueing

SD Ceram

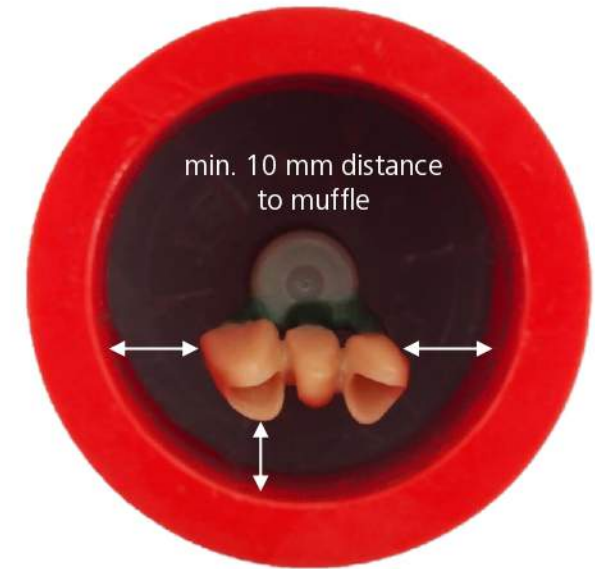
Inlay



Anterior bridge



Muffle



Attach a wax sprue (Ø 3-4 mm) at the thickest part of the wax object. Round up the connection between sprue and object and between ring system and sprue. Attach sprue always in flow direction. Sprue and wax object must not be longer than 16 mm. Keep a distance between silicone ring and wax object of about 10 mm. The cervical margins of the wax objects always point to the silicone ring.



HS10PC Determine wax weight **SD** Ceram



Note: Weight the empty press base - then weigh the press base with the respective modeled object.

up to max. 0.7 g wax weight	1 ingot (3g)
up to max. 1.9 g wax weight	2 ingots (2x3g)



HS10PC Investing

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Note: Please follow carefully the instructions of the investment manufacturer.



components required



fill the inner volume of the crowns with investment



fill up the muffle



put on muffle cover

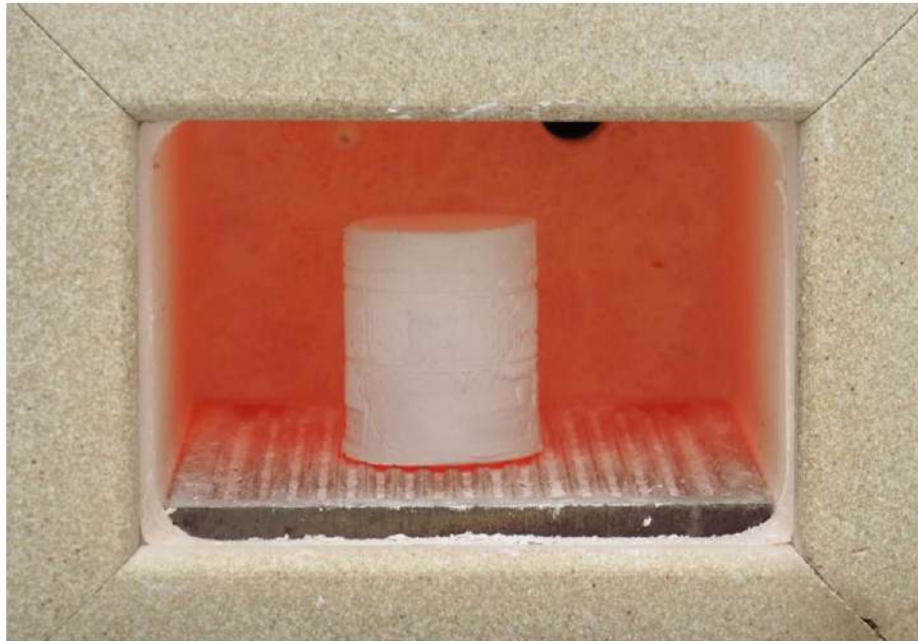
Fill investment bubble free in the silicone ring. Remove excess investment material after the setting time and make sure that the muffle stands straight.



HS10PC Preheating

SD Ceram

Note: Please follow carefully the instructions of the investment manufacturer.



Furnace

Investment rings must be preheated for at least 60 minutes at 850 °C in the burnout furnace.

Important Note: Place ingots and single-use plunger **without preheating** in the muffle before entering the press furnace.



HS10PC Press



Note: Temperatures and times were determined in Zubler Vario Press 300 furnaces. Please adjust parameters according to your results in your particular furnace. See press programmes (page 31).



ingot, single-use plunger and muffle



Place the ingot into the muffle



Place the plunger on top of the ingot.



Muffle in pressing furnace

Before pressing, please start the programme of the empty furnace once, to assure complete heating of all furnace parts. When press furnace is prepared, open the press furnace. Take the muffle ring out of the preheating furnace and place ingot and plunger in the ring. Put the ring in an upright position on the table of the press furnace and start the programme immediately.

Important Note: Place ingots and single-use plunger **without preheating** in the muffle before entering the press furnace.



HS10PC Devesting

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mark the position of plunger on the outside of the investment ring



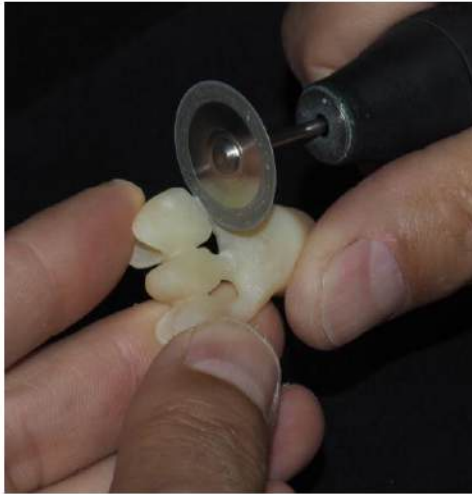
remove excess investment

Mark the end position of the plunger on the ring and remove excess investment with a cutting wheel. Divest objects, beginning with polishing/glass beads (50 μ m) at 4 bar pressure until pressed objects become visible. Divest completely with 2 bar pressure.



HS10PC Finishing

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cut the sprue

Only use suitable cutting and grinding tools for all ceramic objects, to cut sprues, finish the surface and to adjust fit. Avoid excessive grinding and do not overheat the pressed ceramic objects. Work with little pressure at a low rotation speed.

Fit the object to the segment model using Occlu-spray. Adjust fit by removing contact points with a diamond grinder.

Round out the sprue connecting areas following form and function of the restoration.

To clean the object, sandblast the entire outer surface carefully with aluminium oxide at 1 bar pressure and steam afterwards.



HS10PC Modeling - Stain

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Technic (Full Contour)

(SL, SLBL, SLBLT, SLM, LT, MT, HT)



Wax framework (for stain technic)



HS10PC framework elaborated for stains/glaze firing



after stains/glaze firing



HS10PC Modeling - Cut-Back **SD** Ceram

(SL, SLBL, SLBLT, SLM, LT, MT, HT)



Wax framework (for incisal layering)



HS10PC framework (for incisal layering)



before incisal bake



after incisal bake



elaborated for stains/glaze firing



after stains/glaze firing



HS10PC Modeling - Layering

SD Ceram

(L, L+, MO)



Wax framework (for full zircon layering)



HS10PC framework (for full zircon layering)



before dentine bake



after dentine bake



before incisal bake



after incisal bake



elaborated for stains/glaze firing



after stains/glaze firing



HS10PC Dentine/Incisal Bake (zirkon) **SD** Ceram



before dentine bake*



after dentine bake



before incisal bake



after incisal bake

Mix **zirkon** ceramic powder (dentine and/or incisal) with modelling liquid to a creamy consistency. Apply dentine or incisal ceramic in small portions to the cervical and interdental area and compact by light vibration. Then more dentine or incisal is applied according to the tooth layering.

1st Dentine/Incisal Bake

After the dentine application the crown is placed on a firing tray at a starting temperature of 400 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at 45 K/min with vacuum (vacuum starting at 450 °C) to 780 °C (bake temperature). Hold time: 1 minute without vacuum.

For multiple unit prosthesis with bigger amount of porcelain increase the firing temperature about 20-30 °C.

After the first dentine/incisal firing is complete, trim the crown or bridge and clean. Next, apply a second layer of dentine and incisal for the second dentine firing.

2nd Dentine/Incisal Bake

Same procedure as by the first dentine firing, except with a firing temperature of about 10 °C lower than the previous bake.

* Dentine and incisal firing is of course also possible in one go and is common practice.



HS10PC Glaze Finish/Glaze Firing **SD** Ceram



elaborated for stains/glaze firing



after stains/glaze firing

After completely finishing the surface with a diamond instrument, thoroughly clean the crown or bridge. Apply the **glaze LFU** paste or the **glaze LFU** powder mixed with the **glaze liquid** in a thin layer. For colour characterization, **glaze, shades & stains LFU** can be applied and fired. For the firing, please refer to the firing table or to the separate instructions for use.

Glaze Firing

After the stains/glaze application the crown or bridge is placed on a firing tray at starting temperature of 400 °C. Subsequently the furnace is closed with a 4 minute closing time and then heated at 45 K/min without Vacuum to 710 °C (bake temperature). Hold time: 1 Minute (without vacuum).

Natural Glaze (zirkon)

Place the crown on a firing tray at a starting temperature of 400 °C. Subsequently close the furnace with a 4 minute closing time and then heat at a rate of 45 K/min with vacuum to 760 °C (bake temperature). Hold time: 1 minute (without vacuum).



HS10PC Modeling

«nature» (zirkon)

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A thin layer of **zirkon** opaque dentine was applied to the **HS10PC** coping for the simpler «nature» modeling and an effect of depth. The tooth body is built up with **zirkon** dentine materials, slightly contoured and covered with **zirkon** incisal material. After the dentine / incisal firing is complete, **shade & stains LFU** can be used to highlight the colour aspects of the finished crown that match the tooth color. The gloss finish was then made with **glaze LFU**. (Firing table on page 32)



HS10PC Modeling

SD CeraM

«individual» (zirkon)



For the «individual» modeling, a thin layer of **zirkon** opaque dentine was applied to the HS10PC coping for the optical depth effect. **Zirkon** dentine, modifiers, mamelons and various transpa materials were then applied analogously to the internal structure of natural teeth. After the dentine firing, the crown was completed with various **zirkon** incisal and opal materials and fired. Special colour aspects of the finished crown can be highlighted with **shade & stains LFU**. The crown was then given its gloss finish with **glaze LFU**. (Firing table see page 32)



Coloured Modelling Liquids

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If desired, our ceramic powders can be coloured with coloured modeling liquid. This makes it easier for the dental technician to distinguish between the powders when layering.



Issue 04/2021



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HS10PC Correction Bake

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correction
dentine



correction
incisal



correction
neutral

If small corrections (approximal contacts, apical pontic) are required on the finished restoration, correction powder in dentine or incisal shading may be applied without altering the result of the layering. Before application clean the crown or bridge.

Mix **correction** powder with **modelling liquid** to a creamy consistency. Apply small portion of porcelain to the desired area of the restoration. After correction powder application, place the crown on a firing tray at starting temperature.

See firing schedule (page 32).



bridge after
correction bake



shades & stains LFU **SD** *Ceram*



Issue 04/2021

25



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shades LFU

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shade A light
fluor.



shade B light
fluor.



shade C light
fluor.



shade D light
fluor.



shade A
fluor.



shade B
fluor.



shade C
fluor.



shade D
fluor.



Body colours

Area of application: Body colours for the characteristic colouring of A - D colours.



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stains LFU

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Issue 04/2021

27



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stains LFU

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white fluor.



snow white fluor.



vanilla fluor.



beige fluor.



yellow fluor.



yellow 2 fluor.



orange fluor.



orange middle fluor.



orange 2 fluor.



champagne fluor.



safari fluor.



safari + fluor.



olive fluor.



khaki fluor.



rose fluor.



rose pink



red purple fluor.



blue rose fluor.



purple fluor.



red



red bright



smoke fluor.



blue fluor.



pigeon blue fluor.



green fluor.



brown fluor.



dark brown fluor.



red brown fluor.



black fluor.



grey fluor.

Effect colours

Area of application: Effect colours for extensive characteristic colouring.

Note: The colours shown are a selection of our wider range only.



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HS10PC Combination Table



Combination table	A					B				C				D		
tooth colour	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
HS10PC (ingots) S	1	1	2	2	3	1	1	2	3	1	3	3	3	1	1	3
HS10PC (ingots) SL, SLM, LT, MT, HT	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
HS10PC (ingots) L, L+	1	2	2	2	4	1	1	2	2	1	3	3	4	1	5	5
HS10PC (ingots) MO	1	1	2	2	4	1	1	3	3	1	4	4	4	2	4	4
zirkon dentine	A1	A2	A3	A3,5	A4	B1	B2	B3	B4	C1	C2	C3	C4	D2	D3	D4
zirkon incisal	1	2	2	4	4	1	2	3	4	2	2	3	4	1	2	3

HS10PC pressable ingots for different finishing techniques are offered in various ranges of translucency for staining, cut-back or layering technique. A colour chart of the recent available ingot colours is available separately.

In principle any allowed indication could be manufactured from any ingot. For esthetical reasons a correlation of the ingots to the different forms of restorations is recommended according to the correlation table.



HS10PC Correlation Table



			Recommended technique			Recommended indication					
Colour system	Colour range	Field of application	Staining technic	Cut-back	Layering technic	Veneer	Inlay	Onlay	Anterior crowns	Posterior crowns	Three-unit bridges
S	incisal	inlay, onlay, veneer	+	-	-	+	+	+	-	-	-
HT	dentine	inlay, onlay, veneer, crowns	+	+	-	+	+	+	+	-	-
Impulse	opal	inlay, onlay, veneer	+	+	-	+	+	+	-	-	-
SL BLT	bleach dentine	crowns & bridges	+	+	-	+	-	+	+	+	+
SL	dentine	crowns & bridges	+	+	-	+	-	+	+	+	+
SL BL	bleach dentine	crowns & bridges	+	+	-	+	-	+	+	+	+
SL ETC	dentine/incisal	inlay, onlay, veneer	+	-	-	+	+	+	-	-	-
SLM	dentine	crown & bridgework on severely discoloured preparations	+	+	-	-	-	-	+	+	+
LT	dentine	crowns & bridges	+	+	-	+	-	+	+	+	+
MT	dentine	crowns & bridges	+	+	-	+	-	+	+	+	+
L	liner	crown and bridgework	-	+	+	-	-	-	+	+	+
L+	liner	crown & bridgework on severely discoloured preparations	-	+	+	-	-	-	+	+	+
MO	liner	crown & bridgework on slightly discoloured preparations	-	+	+	-	-	-	+	+	+

+ recommended - not recommended



HS10PC Press Programmes



Note: The given firing- and press temperatures were determined in a Zubler Vario 300 and a Zubler Vario Press 300 dental furnace and are approximate values. For other furnace types, corrections to the firing temperatures may be necessary.

Press parameters HS10PC	Muffle size [g]		Start temperature [°C]	Heating rate [K/min]	Vacuum start [°C]	Final temperature [°C]	Pressing time [min]	Holding time [min]	Pressure
Zubler Vario Press 300	100		700	60	700	900	3	18	Low
	200		700	60	700	915	3	20	Low
Dekema press-i-dent 654	100		700	60	700	910	3	15	Level 7
	200		700	60	700	930	3	15	Level 7
Dentsply Multimat NTXpress	100		700	60	700	930	3	15	--
	200		700	60	700	950	3	18	--
Ivoclar Programat EP 3000	100		700	60	700	900	3	18	**
	200		700	60	700	915	3	20	**
Ugin dentaire	100		700	60	700	930	3	15	--
	200		700	60	700	950	3	18	--

**) Please note: The "E"-value in the Ivoclar programme has to be set to "E 600".



HS10PC Firing Chart



Note: The given firing temperatures were determined in a Zubler Vario 300 dental furnace and are approximate values. For other furnace types, corrections to the firing temperatures may be necessary.

Firing parameters	Start temperature [°C]	Closing time [min]	Vacuum start [°C]	Heating rate [K/min]	(Vacuum end) 1 st Bake [°C]	(Vacuum end) 2 nd Bake [°C]	(Without vacuum) Holding time [min]
zirkon dentine/incisal	400	4	450	45	780	770	1
zirkon natural glaze	400	4	450	45	760	--	1
LFU glaze/stains	400	4	---	45	710	--	1
zirkon titan correction	400	4	450	45	720	--	1

Please note: In case of layering on zirconia, retarded opening of the furnace after each bake is required in general, beginning with dentine bake, in particular with voluminous layering of ceramic. Firing temperature depends on the number of units in the furnace. More units require up to 20-30 °C higher dentine/incisal firing temperatures.



HS10PC Technical Data



HS10PC comply to all applicable standards for dental porcelains (DIN EN ISO 6872/ DIN EN ISO 10993-5). All limits are undercut and therefore outperformed.

Materials characterisation

Material : Lithium disilicate ceramic

Chemical composition: Mayor components embedded in the glass ceramic structure: SiO_2 , Li_2O , K_2O , Al_2O_3 , ZnO , ZrO_2 , P_2O_5

Classification acc. DIN EN ISO 6872:2019

Type: 1 ☐ 2 ☒ Class: 1 ☐ 2 ☐ 3 ☒ 4 ☐ a ☒ b ☐ c ☐

Physico-chemical properties – acc. DIN EN ISO 6872

Property	Spezification	Actual value
Coefficient of thermal expansion (25 - 500 °C) [$\cdot 10^{-6} \cdot \text{K}^{-1}$]	10.0 ± 0.5	10.0
Transformation temperature Tg [°C]	510 ± 20	520
Bending strength [MPa]	≥ 300	> 350
Solubility [$\mu\text{g}/\text{cm}^2$]	< 100	< 40

