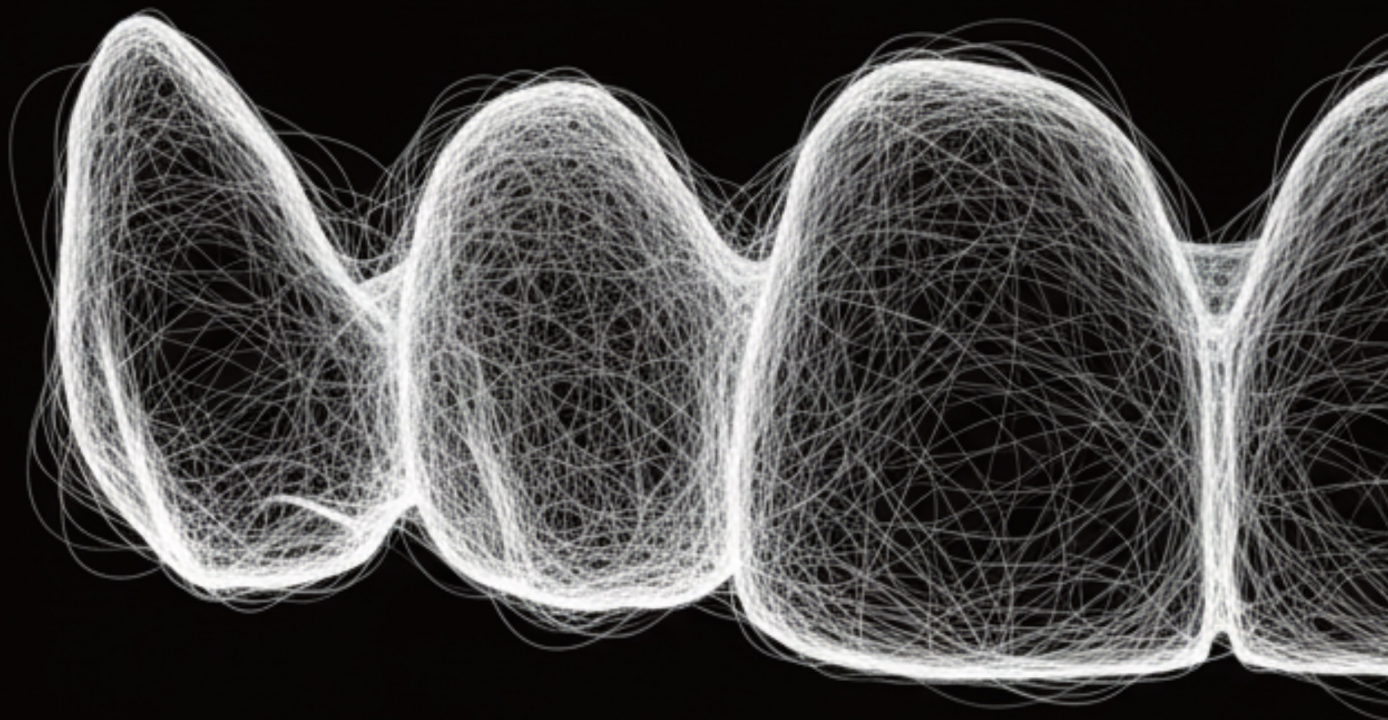
vatech mcis

Perfit ZR

Perfect Aesthetic Zirconia Solution

User Manual

Meeting Your Unique Requirements With Confidence



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1 Product Information

Perfit ZR

Perfit ZR is partially sintered zirconia disc that features vatech's innovative Uniform Compaction Firing (UCF) technology to optimize machinability of the discs, isotropic shrinkage during final sintering, and physical properties including flexural strength, translucency, and shades.

We are confident that Perfit ZR will meet your unique requirements.

Specification

UT	ST	HT	STML	TSML
5Y-TZP	4Y-TZP	3Y-TZP	4Y-TZP	5Y-TZP / 4Y-TZP

50%	46%	42%	46%	46~50%

Translucency

Strength

800 MPa	1,100 MPa	1,300 MPa	1,100 MPa	800 ~ 1,100 MPa

Available Shades and Thicknesses by Disc Type

Product		Shades	Available Thickness (mm)
Pre-Shaded	UT, ST, HT	A1, A2, A3, A3.5, A4 B1, B2, B3, B4 C1, C2, C3, C4 D2, D3, D4	10, 12, 14, 16, 18, 20, 22, 25
Multilayer	STML, TSML	BL1, BL2, BL3, BL4 A1, A2, A3, A3.5, A4 B1, B2, B3, B4 C1, C2, C3, C4 D2, D3, D4	12, 14, 16, 18, 20, 22, 25, 30

1 Product Information

Perfit CL

Perfit CL was developed through the analysis of absorption and the spectrum of transmitted light.
The system consists of 16 body liquids based on the VITA shade guide and 11 effect liquids designed to adjust chroma in the cervical, proximal, and body areas.
The liquids are formulated to optimize shade reproduction, helping achieve vivid and natural tooth coloration.
Perfit CL is also compatible with zirconia restorations fabricated using products from other manufacturers.

Body Liquid (50ml)
vatech provides 16 body liquids that can reproduce basic dentin color.
A class : 5 shades B class : 4 shades C class : 4 shades D class : 3 shades

Effect Liquid (20ml)
Effect liquids are able to express unique characteristics of the patient's own teeth.
It is available to show translucency, brightness, chroma, crack, opal, opaque, gingival color etc.

Violet
Use for expressing translucency on the incisal.

Blue
Use for expressing translucency and opal on young people.

Gray
Use for lower the brightness and expressing the enamel.

Dark Gray
Use for expressing deep translucency of the end of incisal.

Orange
Use for expressing wearing, yellow and high chroma.

Snow
Use for expressing opaque color.

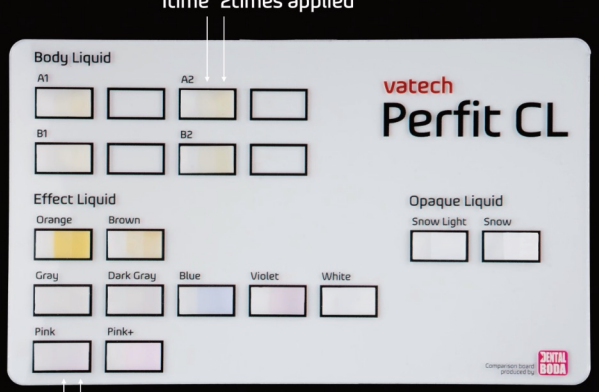
Snow Light
Use for expressing opaque color and crack line on the incisal.

Brown
Use for fossa, Embrasure, wear, Cervical.

White
Use for expressing line angle and lower brightness on the incisal.

Pink
Use for raising brightness of dentin and expressing gingival.

Pink+
Same as pink function but It's bit deeper.



2 General Information

Technical Data (Properties)

Perfit ZR Dental Zirconia discs can be milled into dental restorations using various CAD / CAM or manual milling machines.

	Perfit ZR UT	Perfit ZR ST	Perfit ZR HT	Perfit ZR STML	Perfit ZR TSML
Flexural Strength * (MPa)	800	1,100	1,300	1,100	800~1,100
Translucency (%) **	50	46	42	46	46~50
Materials	5Y-TZP	4Y-TZP	3Y-TZP	4Y-TZP	4Y/5Y-TZP

* EN ISO 6872:2024, specimen: 3×4×45 mm (white color)
** EN ISO 13468-1, specimen thickness: 1.0 mm (white color)

General Instruction

· All Discs should be processed by dental professionals.
· Inspect the product for any damage.
· Confirm thickness and shade of disc for its intended use.
· Avoid exposure to foreign particles or liquids.
· Ensure that the disc is placed in the original packaging box under dry conditions.

Safety Information

vatech understands and respects the importance of safe procedures when handling coloring liquids.
Please refer to the following guide to ensure your own safety.

Please wear a face mask, gloves and safety glasses for your safety. These help to avoid inflammation of the skin.
Do not drink coloring liquids. Keep coloring liquids away from children.
The coloring liquid may be handled by trained or professional dental technicians.

3 Technical Instruction

Indications

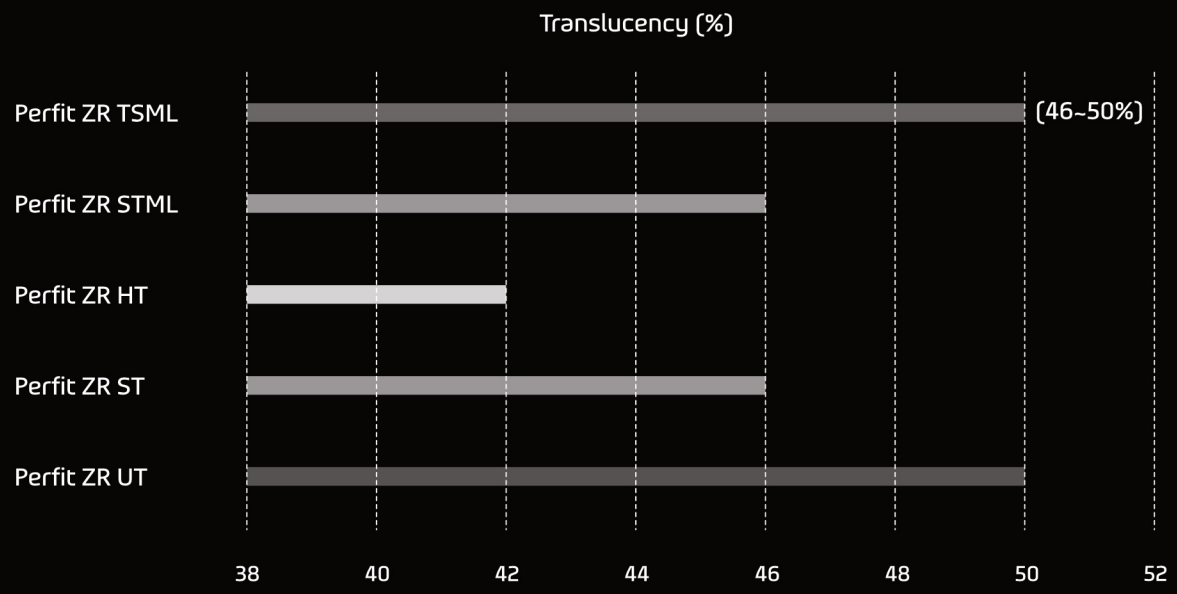
The following table lists recommended indications.
Indications may be different depending on the patient's condition.
Select the product by referring to its translucency and flexural strength.

Indications	Recommended Perfit ZR				
	UT	ST	HT	STML	TSML
 Monolithic Bridge		●	●	●	●
 Frameworks		●	●	●	
 Monolithic Crown (Anterior)	●	●		●	●
 Monolithic Crown (Posterior)	●	●	●	●	●
 Coping			●		
 Veneer & Inlay / Onlay	●				

3 Technical Instruction

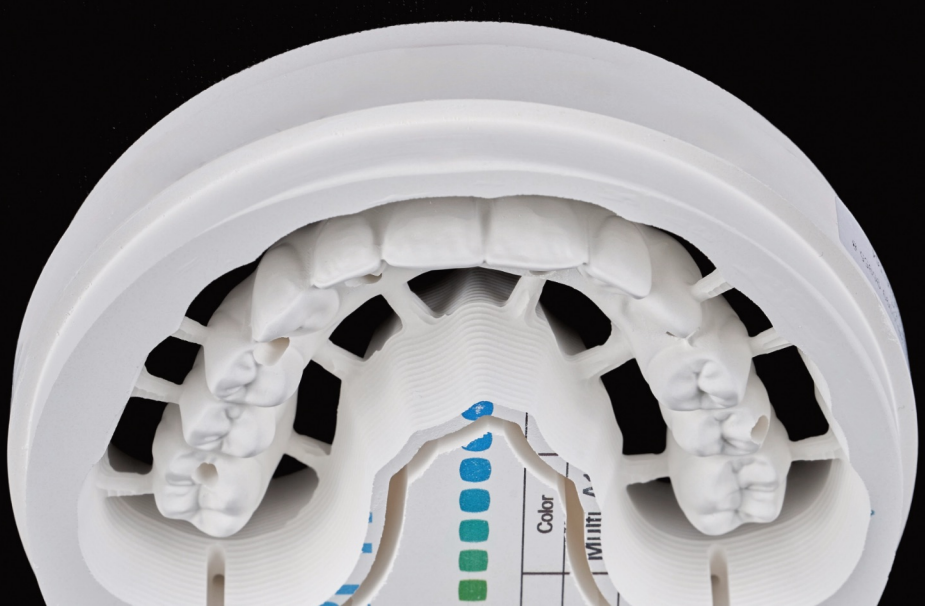
Indications for Use

Perfit ZR has five types of discs according to their translucency and flexural strength, as shown in the graph below.
Depending on its translucency and flexural strength, the disc may create restorations for Anterior to Posterior and from a single crown to a long bridge.



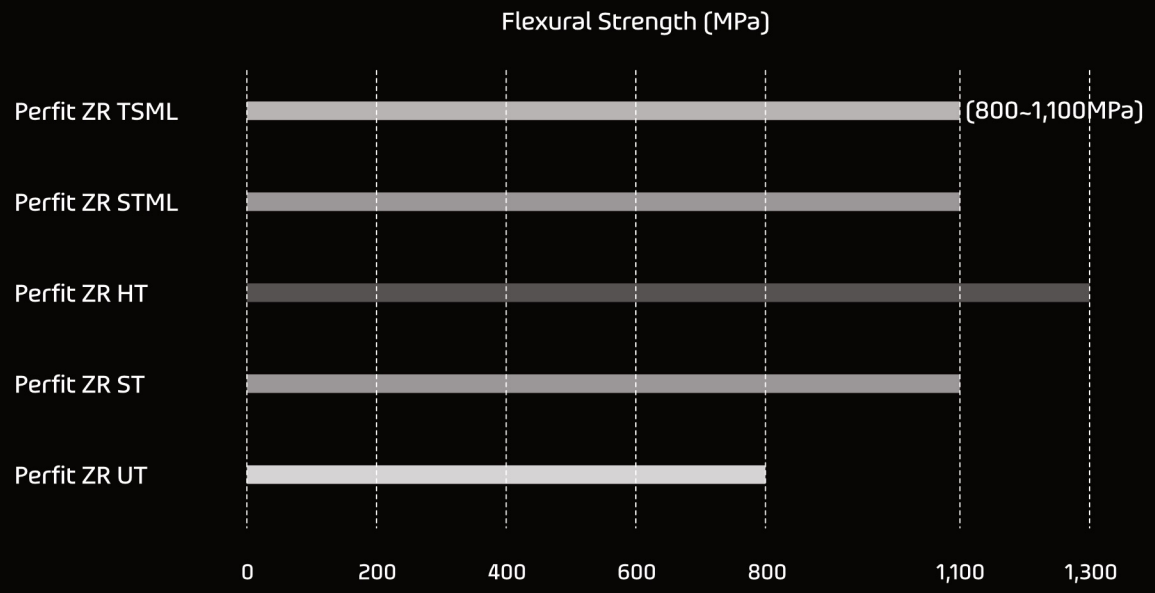
When selecting materials for anterior fabrication, translucency is considered the most.
In the Perfit ZR line-up, high translucency products, UT, ST, STML and TSML, are used.
Perfit ZR UT is a Pre-Shaded disc that has the highest translucency among Perfit line-up, so anterior, Anterior bridge, veneer and inlay/onlay may be created from the UT.

This product may compete with PFM and Glass Ceramic as high translucency restorations.
Perfit ZR TSML is a multilayered zirconia that uses two types of materials.
It has the advantage of lifelike teeth shade on the surface, so coloring is even simpler in the anterior case.
Select materials by referring to their translucency.



3 Technical Instruction

Indications for Use



When selecting materials for posterior fabrication, flexural strength is considered the most because the occlusal force of posterior is 2.5 times higher than the anterior force.

In Perfit ZR line-up, ST, HT, STML and TSML are available for posterior restorations.
Perfit ZR HT is commonly used for long bridge, All on 4, and All on 6.
Other types of discs may be selected according to patient's specific needs.

In the case of Perfit ZR TSML, it is composed of two different types of zirconia.
Since TSML has high strength of the cervical and high translucency of the Incisal, it can also be used for premolar that requires stability and aesthetics at the same time.

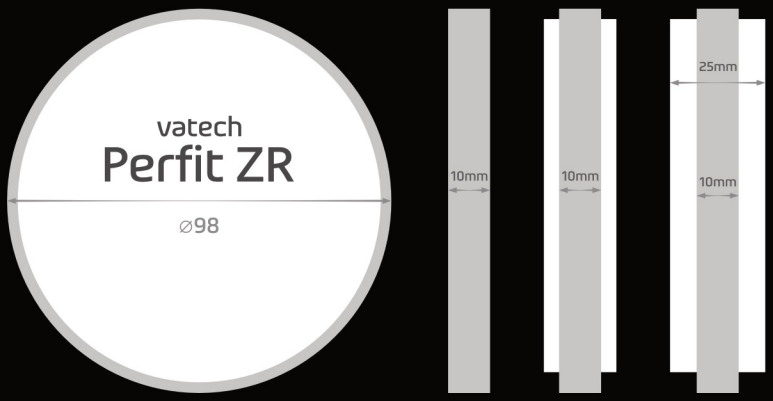
Please refer to the flexural strength of the disc and the patient' specific restoration needs when making the disc selection.

3 Technical Instruction

Disc Selection

When selecting a disc, thickness and shade must be considered.
The thickness of the disc may be selected according to its length of the crown.

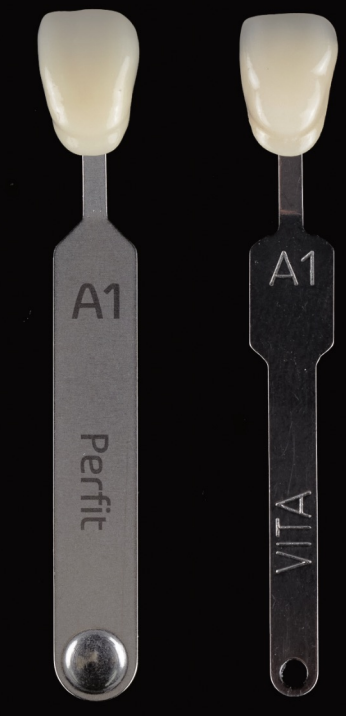
Geometry



Available Thickness

Pre-Shaded : 10, 12, 14, 16, 18, 20, 22, 25mm
Multilayer : 12, 14, 16, 18, 20, 22, 25, 30mm

Shade



(left) Perfit TSML A1 / (right) VITA Shade guide A1

vatech Perfit ZR is manufactured to match the VITA shade guide. Therefore, the disc shade can be selected by simply matching it to the patient's natural tooth shade.

However, Perfit ZR exhibits slightly higher brightness compared to the VITA shade guide.
This intentional difference provides room for staining adjustments, allowing the final restoration to achieve a natural brightness after the staining process.

3 Technical Instruction

Disc Selection

Shade Composition (TSML, STML)

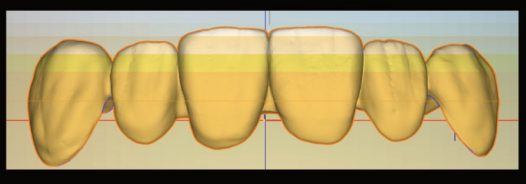
Indications		12mm	14mm	16mm	18mm	22mm	
Incisal zone	Layer 1	3.0	3.0	3.0	3.0	3.0	Fixed thickness (7mm)
	Layer 2						
Intermediate zone	Layer 3	2.0	2.0	2.0	2.0	2.0	
	Layer 4	2.0	2.0	2.0	2.0	2.0	
Body (Dentin zone)	Layer 5	5.0	7.0	9.0	11.0	15.0	Variableness by thickness (5~18mm)

A large area of dentin zone may be required for some gingival or root work. Multilayered zirconia from some manufacturers have fixed ratio of Dentin Zone and may not express its dentin shade fully due to the lack of Dentin Zone.
However, Perfit ZR multilayered zirconia does not have fixed ratio of Dentin Zone but has increasing Dentin Zone with its increasing thickness.

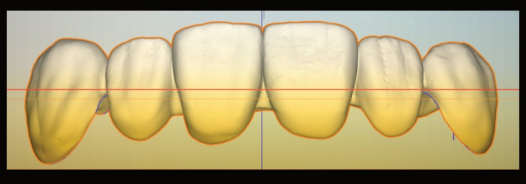
When using a multi-layer disc, the disc thickness must be selected according to the length of the patient's natural incisal translucency.
If the total length of the anterior crown is 14mm and the patient exhibits an extended translucent zone, a disc thicker than 14mm should be chosen to properly accommodate the required translucency layer.

Easy recognition, Easy positioning

The incisal and dentin zones are clearly visualized in the CAM software, enabling precise positioning of the restoration according to the patient's required incisal translucency length.



Perfit ZR Layer Structure
in CAM Nesting



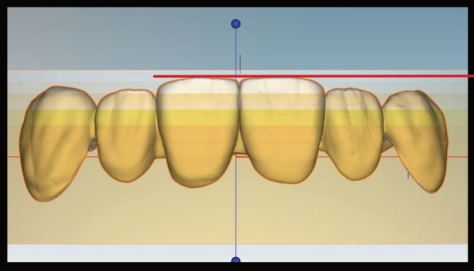
Other manufacturer Layer Structure
in CAM Nesting

3 Technical Instruction

Positioning

Positioning Instruction

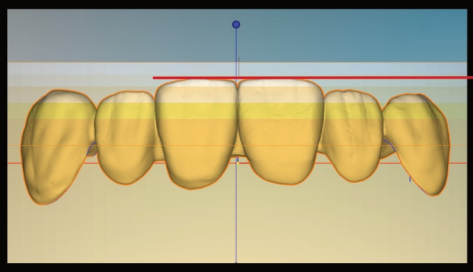
1. Positioning for achieving shade and shade-gradient alignment identical to the VITA shade guide.



Under 1mm from the surface

This positioning is suitable for the VITA shade guide,
and it is also appropriate for general cases.
The incisal edge should be positioned 1 mm below the disc surface.

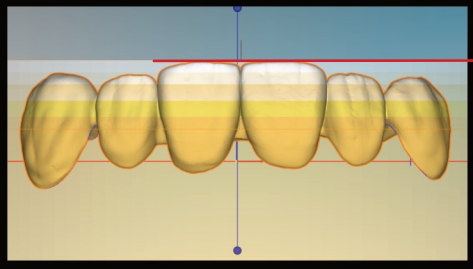
2. Positioning for patients with a short incisal translucency zone



Within Layer 2

It is recommended to position the restoration lower within the disc.
The placement should be determined within Layer 2
according to the required translucency length.

3. Positioning for patients with an extended incisal translucency zone



Within Layer 1

It is recommended to position the restoration deeper toward the lower portion of the disc.The placement should be determined within Layer 1 according to the required translucency length.
Depending on the case, the incisal edge may be positioned
at the very top surface of the disc.

3 Technical Instruction

Workflow

The following workflow describes the process of fabricating dental restorations using vatech Perfit ZR. Perfit ZR consistently delivers the highest-quality results.

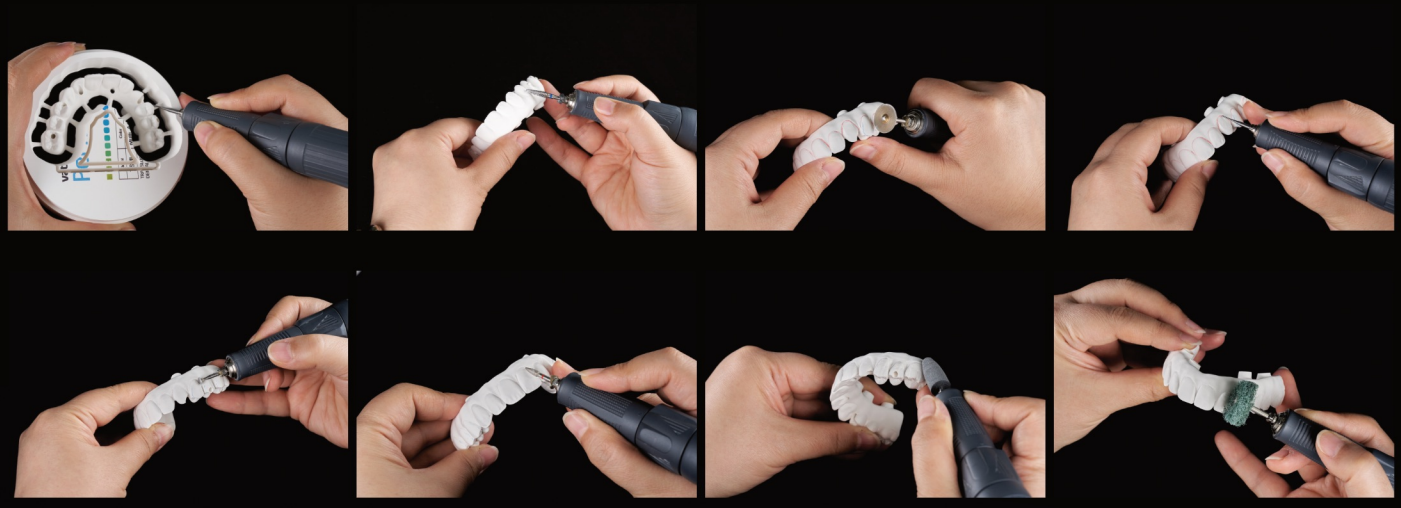
Design with CAD → Milling with CAM → Contouring → Glazing (Staining Optional) → Sintering → Pre-sintered Coloring (Optional)

3 Technical Instruction

Contouring

To prevent microcracks, the handpiece must be controlled at a low speed with carefully regulated pressure.
Use carbide burs, diamond wheels, denture burs, fissure burs, and silicone burs and so on... to contour the restoration while preserving the natural anatomical features.
The strength and stability of Perfit ZR allow for easier and more efficient contouring.

After contouring, thoroughly remove all remaining zirconia particles using compressed air to ensure that no residue remains in any area.
Residual zirconia powder may cause fitting issues, so complete and meticulous cleaning is essential.



› If the coloring liquid does not absorb properly due to oils from the hands, the use of latex gloves is recommended.

3 Technical Instruction

Coloring

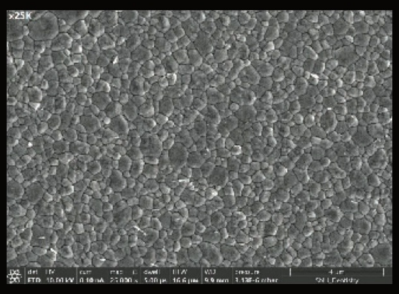
Indication

Perfit CL is do coloring using immersion and brush techniques.
It can be made use of Perfit ZR UT, ST, HT, STML, TSML, and each coloring technique is slightly different.

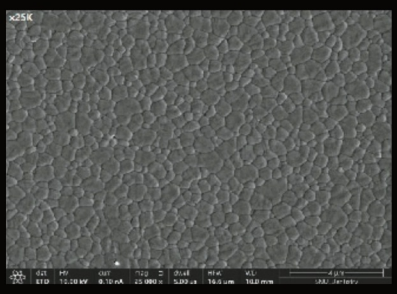
Relationship Between Grain Size and Translucency, and Its Effect on Coloring

Smaller grain size → Bigger grain size

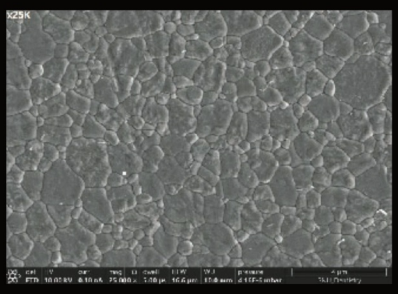
Relatively opaque, Relatively not easy coloring — Translucent, Easy coloring



3Y-TZP
HT



4Y-TZP
ST, STML, TSML (Cervical zone)



5Y-TZP
UT, TSML (Incisal zone)

The more Yttria content increases the grain size and translucency of zirconia they bigger.
The larger the grain size, the coloring liquid of high chroma should be used since different pigmentation.
When the same coloring liquid is used in 3Y and 5Y discs, unlike colors may come out due to the different pigmentation of the coloring liquid.
For this reason, control the volume of the coloring liquid when you use different kinds of discs.

Perfit ZR TSML is consisted of 5Y-TZP on the Incisal, 4Y/5Y-TZP on the transition zone, and 4Y-TZP for cervical.
The concentration of the coloring liquid should be adjusted depending on the layers applied.

When coloring a multilayer disc, the incisal area should be lightly applied with minimal brush pressure to avoid excessive shade saturation.
In contrast, the cervical area should be colored with relatively greater brush pressure to achieve stronger shade intensity.
This differential application helps produce a more natural and anatomically appropriate color gradient.

3 Technical Instruction

Coloring

Brush Techniques for Natural Appearance

Understanding the characteristics of a multilayer disc is essential for achieving a natural tooth shade.
By adjusting the amount of coloring liquid and the brush pressure according to each layer of the multilayer disc, a more natural and harmonious final outcome can be produced.

Incisal zone

The incisal zone of TSML (5Y-TZP) can be effectively characterized with only a small amount of coloring liquid applied lightly with the brush.

To achieve a comparable level of characterization in the 4Y-TZP layer, a slightly greater amount of coloring liquid is required

Dentin zone

Coloring penetration is relatively limited in the 3Y-TZP dentin zone.

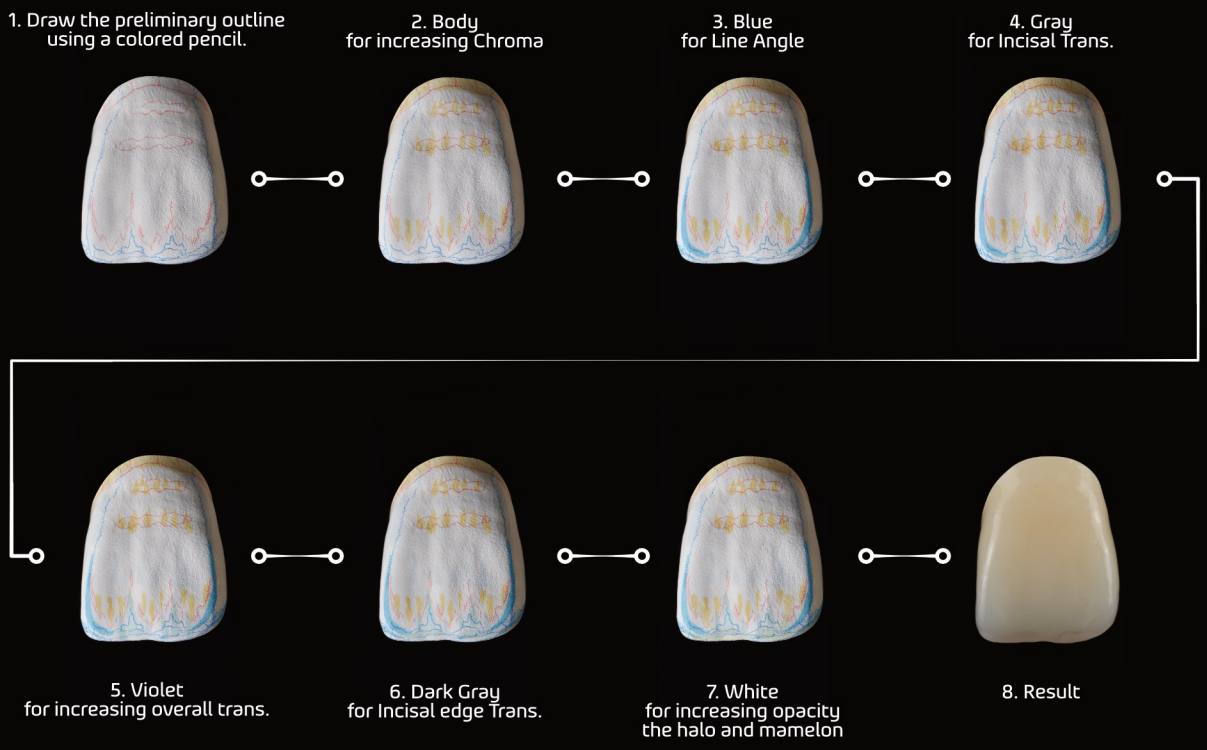
Therefore, applying a greater amount of coloring liquid with firmer brush pressure than in the incisal zone.
This approach helps achieve a more natural final appearance.

3 Technical Instruction

Coloring

Coloring Sequence

Coloring is applied to the cervical, body, and incisal regions to enhance chroma and preserve the natural characteristics of the tooth. The amount of coloring liquid and the brush pressure should be adjusted according to the material properties of the zirconia layers, such as 4Y-TZP and 5Y-TZP.



Results After Sintering

No Coloring Coloring

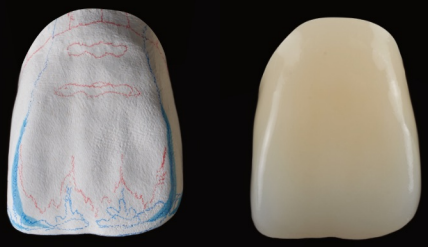
3 Technical Instruction

Coloring

Coloring Effects of CL

The images below show how each Perfit CL appears after sintering. Although the effects are subtle rather than visually pronounced, they gently reproduce the natural characteristics of a real tooth.
Perfit CL delivers natural and excellent results even when applied in small amounts only to the required areas. There is no need for excessive application or repeated drying of coloring liquid.

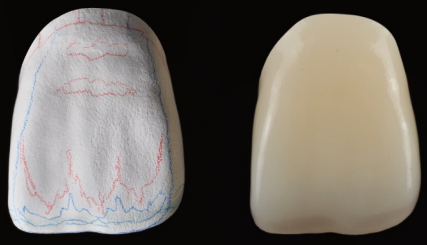
Body
Used to increase chroma in the cervical, body, and mamelon regions.



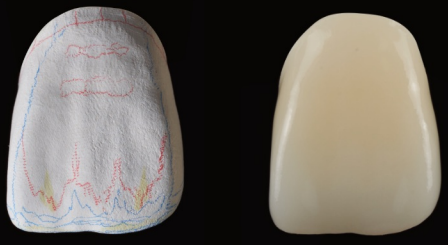
Blue
Used to express the bluish and translucent appearance of the line angle.

Gray
Used to enhance incisal translucency.

Violet
Used to enhance translucency.



Dark Gray
Used to enhance translucency at the incisal edge.



White
Used to express the mamelon tips or the halo effect.

3 Technical Instruction

Sintering

Sintering is a critical step for achieving optimal shade, translucency, and mechanical strength.
Sinter the zirconia according to the recommended sintering program for each product.
Always follow the sintering program specified for the zirconia product.

Prior to Sintering

- Check the shrinkage factor indicated on the zirconia product.
- Mill the disc according to the required restoration design.
- If coloring liquids have been applied to the milled frameworks, dry them for 10-25 minutes at a temperature below 140°C, depending on the size of the restorations.

Anterior single Crown

Place the restoration on the labial surface.

Place the restoration on the lingual surface.

Do NOT place the restoration on the crown margins.

Posterior Single Crown

Place the restoration on the occlusal surface.

Do NOT place the restoration on the crown margin

Anterior Bridges

Place the restoration on the labial surface and provide support to the pontic.

Place the restoration on the incisal edges. The pontic must rest on the sintering tray.

Do NOT place the restoration on Crown margins.

3 Technical Instruction

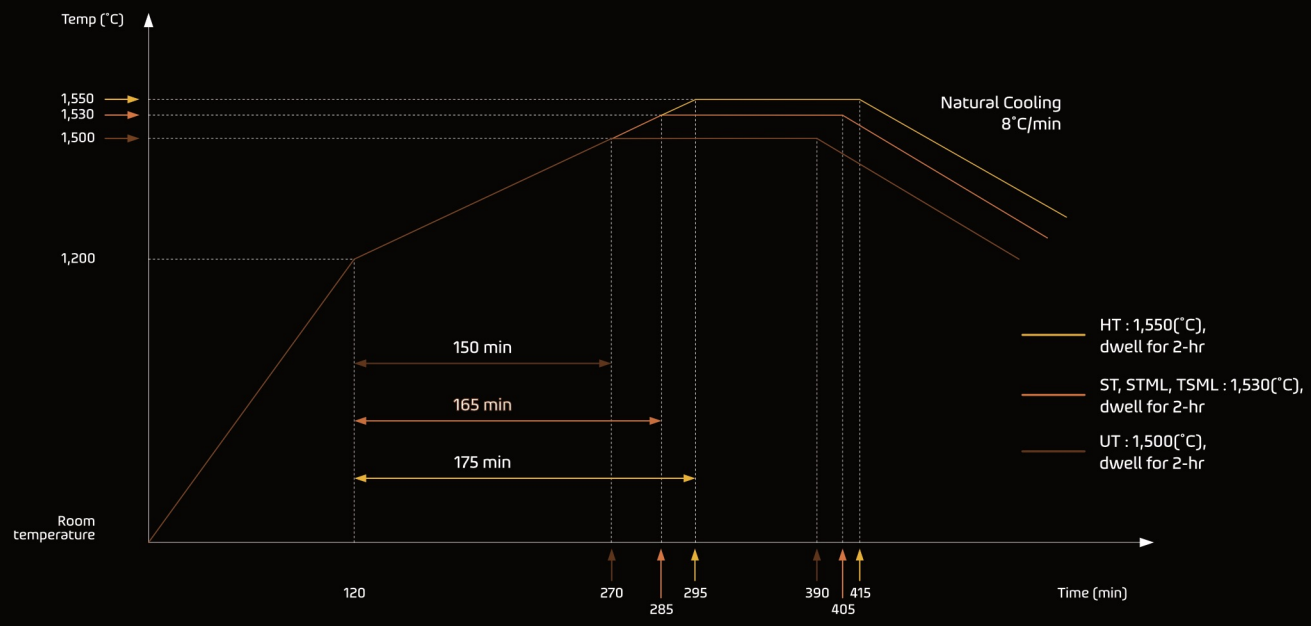
Sintering

Standard Sintering Program

- Volume change at 1,000˚C, changing color at 1400˚C, and coloring liquid diffusion at 1450-1550˚C are generated for zirconia.
- Usually, sintering temperature at long time is stable for volume change, flexural strength and translucency.
- The table below shows the standard schedule for Perfit ZR ST, Perfit ZR STML and Perfit ZR TSML.

Step	Starting Temp (˚C)	Target Temp (˚C)	Heating Rate (˚C/min)	Holding Time (m)	Time (m)
1	20	1,200	10	-	118
2	1,200	Target Temp	2	-	150 - 175
3	Target Temp	Target Temp	-	120	120
4	Target Temp	20	-8	-	185 - 191
				Total	573 - 604

Recommended Target Temp.(˚C) Perfit ZR HT (1,550) / ST, STML, TSML (1,530) / UT (1,500)



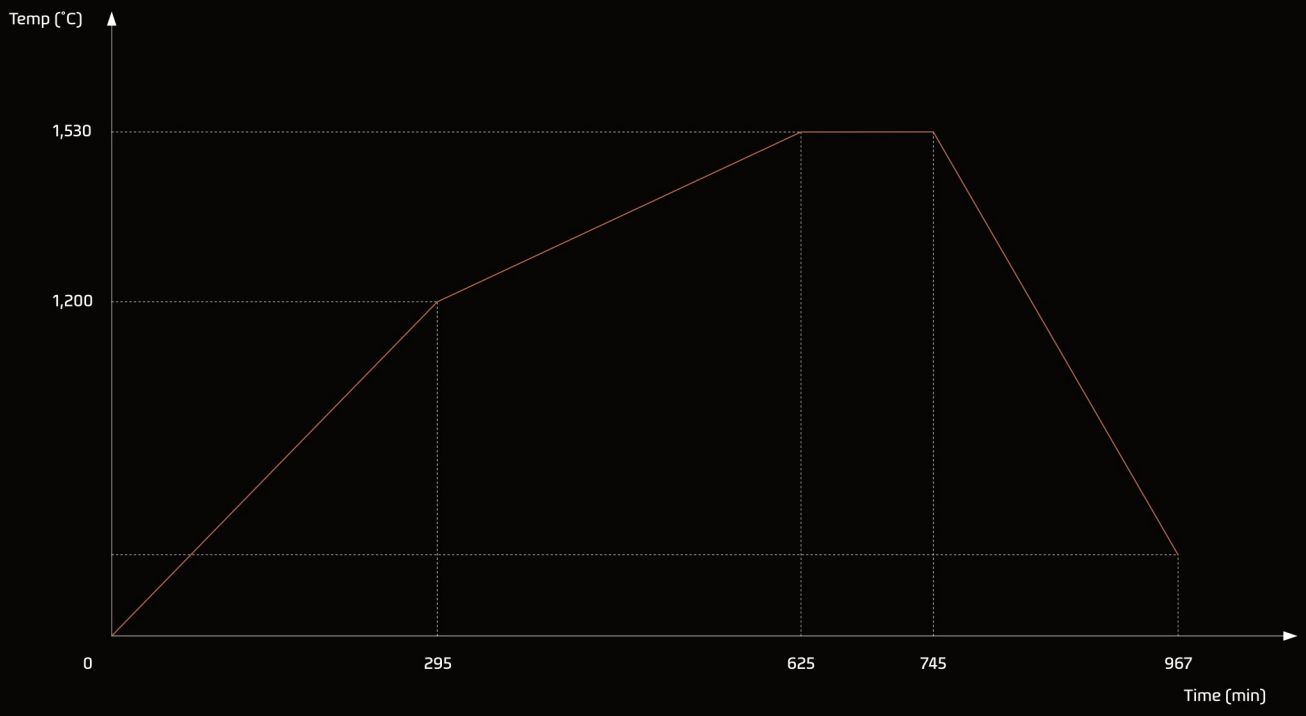
3 Technical Instruction

Sintering

Long Sintering Program

- Can be used with one or two stacked trays
- Applicable to cases with up to 15 or more single crowns per tray
- Applicable to bridge cases requiring a full arch or sintering support (stabilizer)
- For sintering furnaces without cooling control, do not open the door until the temperature reaches 200˚C
- The table below shows the long schedule for Perfit ZR ST, Perfit ZR STML and Perfit ZR TSML.

Step	Starting Temp (˚C)	Target Temp (˚C)	Heating Rate (˚C/min)	Holding Time (m)	Time (m)
1	20	1,200	4	-	295
2	1,200	1,530	1	-	330
3	1,530	1,530	-	120	120
4	1,530	20	-6	-	222
				Total	967



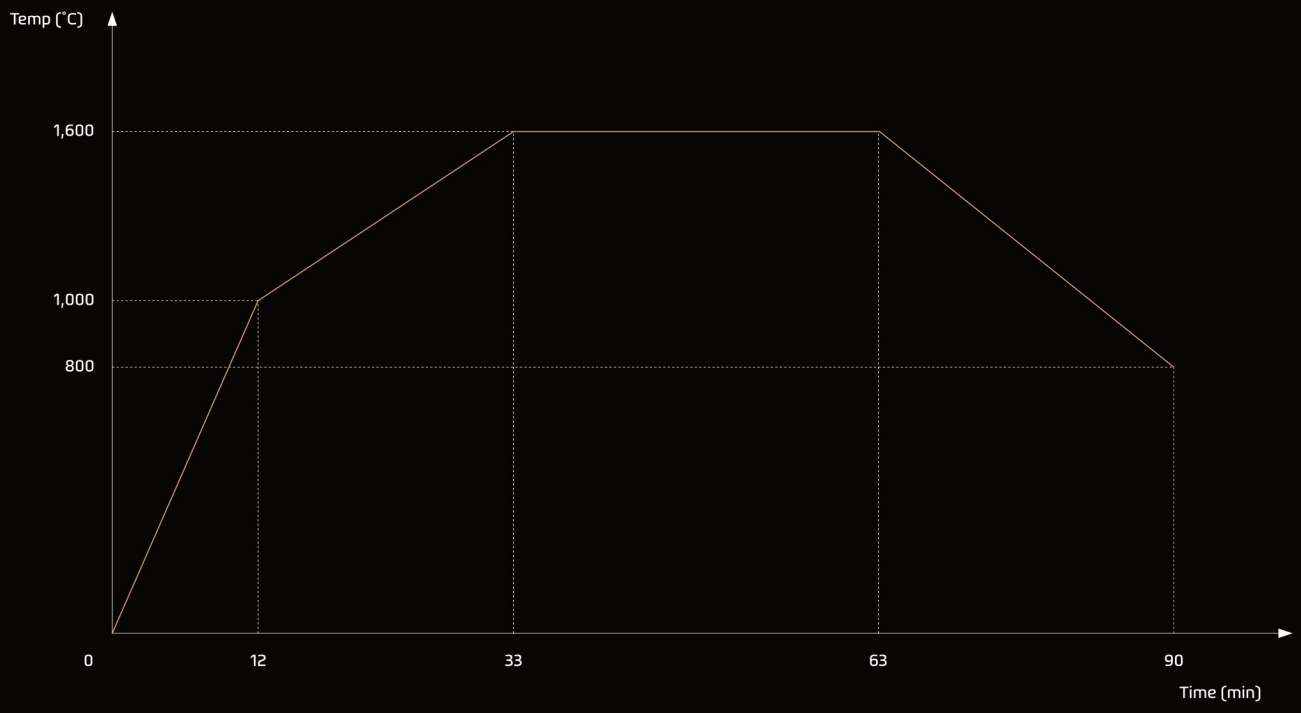
3 Technical Instruction

Sintering

Fast Sintering Program (1)

- The table below shows the fast schedule for Perfit ZR ST, Perfit ZR STML and Perfit ZR TSML
- This schedule completes the sintering process in approximately 90 minutes
- It is recommended to use one tray and apply it for up to three single crowns or one 3-unit bridge

Step	Starting Temp (˚C)	Target Temp (˚C)	Heating Rate (˚C/min)	Holding Time (m)	Time (m)
1	20	1,000	80	-	12
2	1,000	1,600	28	-	21
3	1,600	1,600	-	30	30
4	1,600	800	30	-	27
				Total	90



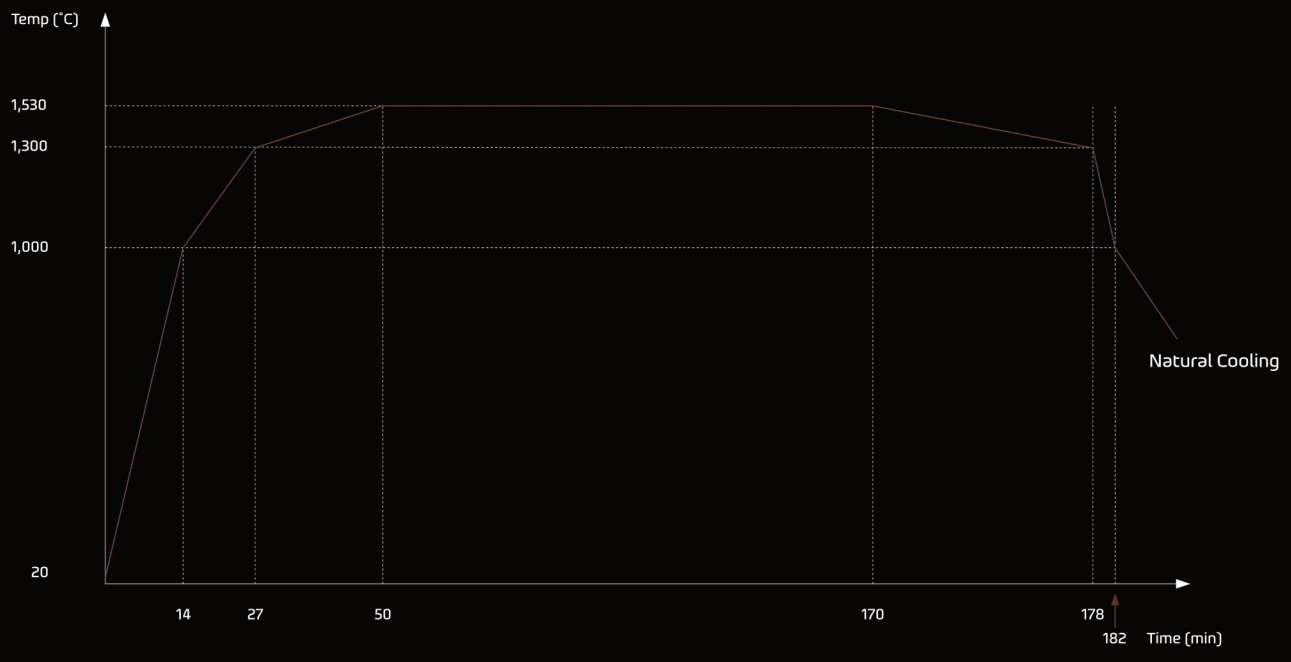
3 Technical Instruction

Sintering

Fast Sintering Program (2)

- The table below shows the fast schedule for Perfit ZR ST, Perfit ZR STML and Perfit ZR TSML
- This schedule completes the sintering process in approximately 182 minutes and is applicable to all indications.

Step	Starting Temp (˚C)	Target Temp (˚C)	Heating Rate (˚C/min)	Holding Time (m)	Time (m)
1	20	1,000	70	-	14
2	1,000	1,300	23	-	13
3	1,300	1,530	20	-	23
4	1,530	1,530	-	120	120
5	1,530	1,300	-30	-	8
6	1,300	1,000	-70	-	8
7	1,000	20	Natural Cooling	-	-
				Total	182



3 Technical Instruction

Finishing

Final contouring (surface refinement, proximal contact adjustment, and occlusal adjustment) and glazing or polishing are performed to complete the restoration.
Glazing smooths the zirconia surface, reducing antagonist tooth wear.
It also enhances the accuracy of the final shade reproduction and improves overall esthetics.

Polishing increases surface gloss; however, its reflective nature may reduce translucency.
Therefore, glazing is generally recommended over polishing for optimal esthetic outcomes.

Apply glaze to the outer surface. In general, a higher glaze application results in increased brightness, while a lower glaze concentration reduces brightness.
Therefore, adjust the glaze intensity according to the desired final appearance.

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Perfit ZR

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User Manual

Meeting Your Unique Requirements With Confidence

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