IPS e.max Zirconia

[en] Instructions for Use

Zirconium oxide disc (ZrO_2)
Color Liquid

CE 0123

Rx ONLY

Date information prepared:
2025-11-18 / Rev. 00v94

Manufacturer:
Ivoclar Vivadent AG
Bendererstrasse 2
9494 Schaan/Liechtenstein
www.ivoclar.com

ivoclar

1 Intended use

1.1 Intended purpose
Fabrication of single-tooth restorations and bridges in the anterior and posterior region.

1.2 Patient target group
– Patients with permanent teeth
– Adult patients with dental implants

1.3 Intended users
– Dental technicians; see chapter Labside use [▸ 3].
– Dentists (clinical procedure); see chapter Chairside use [▸ 6].

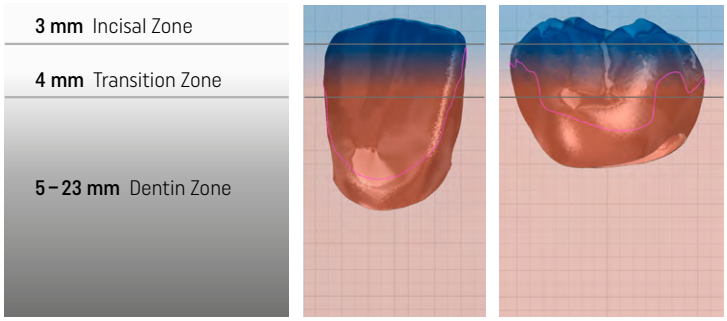
1.4 Special training
None

1.5 Use
For dental use only.

1.6 Description
IPS e.max Zirconia is an yttrium-stabilized zirconium oxide for the fabrication of fixed all-ceramic restorations according to ISO 6872:2024 Type 2, Class 5.

Disc	Shade range	Disc thickness
IPS e.max Zirconia	BL1, BL2, BL3, BL4, A1, A2, A3, A3.5, A4, B1, B2, B3, B4, C1, C2, C3, C4, D2, D3, D4	12 mm, 14 mm, 16 mm, 18 mm, 22 mm, 25 mm, 30 mm

The discs consist of the following zones: Incisal zone, transition zone, dentin zone:



IPS e.max Zirconia Color Liquids/IPS e.max Zirconia Effect Liquids are ready-to-use solutions that burn out without leaving residue for the visible staining and characterization of unsintered zirconium oxide restorations.

1.7 Technical specifications

Property	Specifications	Typical mean value (according to ISO 6872:2024)
		IPS e.max Zirconia
Flexural strength [MPa]	≥ 900	1200
Fracture toughness [MPa •$m^{1/2}$]	-	3.7
CTE (25–500°C) [10^{-6}/K]	10.2 ±0.5	-
Chemical solubility [µg/cm^2]	< 100	-

1.8 Composition
IPS e.max Zirconia
Components: Zirconium oxide (ZrO_2): 87.0–94.5%, yttrium oxide (Y_2O_3): 5.0–9.0%, hafnium oxide (HfO_2): ≤ 3.0%, aluminium oxide (Al_2O_3): ≤ 0.25%, other oxides: ≤ 1.0%

2 Notes on chairside use

2.1 Indications
– Missing tooth structure in anterior and posterior teeth
– Partial edentulism in the anterior and posterior region

Types of restorations:
– Crowns
– 3-unit bridges
– Multi-unit bridges with 2 connected pontics
– Multi-unit bridges with >2 to 4 connected anterior pontics
– Cantilever bridges with one pontic
– Adhesive bridges
– Hybrid bridges
– Hybrid structures and hybrid crowns
– Inlays
– Onlays
– Veneers

2.2 Contraindications
The use of the product is contraindicated if the patient is known to be allergic to any of its ingredients.

2.3 Limitations of use
The use of the product is not permitted in the following cases:
– Untreated bruxism
– Reuse of the final restoration
– Temporary insertion
– One-piece abutments
– Use of the product for indications/types of restorations not intended by the manufacturer

2.4 Side effects
No known to date.

2.5 Interactions
No known to date.

2.6 Clinical benefit
– Reconstruction of chewing function
– Restoration of esthetics

3 Labside use

Anterior and posterior restorations on prepared teeth and on approved implant abutment systems

Types of restorations	Anterior region		Posterior region	
	Minimum wall thickness of the restoration	Minimum connector dimensions	Minimum wall thickness of the restoration	Minimum connector dimensions
Crown	0.6 mm	-	0.7 mm	-
3-unit bridge [1]	0.8 mm	9 mm^2	0.8 mm	12 mm^2
Multi-unit bridge with 2 connected pontics [1]	0.8 mm	10 mm^2 btw. pontics: 14 mm^2	1.0 mm	15 mm^2 btw. pontics: 20 mm^2
Multi-unit bridge with >2 to 4 connected anterior pontics [1]	1.0 mm	20 mm^2	-	-
Cantilever bridge with one pontic [1]	0.8 mm	10 mm^2	0.8 mm	15 mm^2
Hybrid structure and hybrid crown	0.7 mm	-	0.7 mm	-
Hybrid bridge [1]	1.0 mm	20 mm^2	1.0 mm	22 mm^2
Inlay, onlay	-	-	0.5 mm	-

[1]
– In the case of bridges, at least one third of the connector cross-sectional area should be positioned in the dentin zone.
– In the case of cantilever bridges with one pontic, the entire connector cross-sectional area must be positioned in the dentin zone and a minimum connector dimension of 15 mm² at the pontic is recommended.
– Adhesive bridges must not be fabricated using the speed sintering process.
– For optimized mechanical stability, the vertical dimension of the connector should be greater than the horizontal dimension.
– The basal side of the connectors should be rounded to reduce stress concentrations and improve mechanical stability of the bridge construction.
– In Canada, bridge indications are limited to 6 units with a maximum of 2 connected pontics.

Types of restorations	Anterior region		Posterior region	
Veneer	0.5 mm	-	-	-
Adhesive bridge [1]	0.8 mm	10 mm^2	-	-

Table 1: Fully or partially anatomical restoration parameters

3.1 Designing, nesting and fabricating restorations in the CAD/CAM process

NOTICE! To achieve a good shade match with the shade guide and an esthetic progression of translucency, position the restoration 1.0 mm below the top edge of the disc.

1. Design the restoration while adhering to the parameters, see Table 1.
2. Enter magnification factor and disc size.
3. Nest the restoration.
4. Place holding bars (minimum diameter 2.0 mm) at least 1.0 mm above the preparation margin, in the area of the anatomical equator.

– In the case of single-tooth restorations: 3 holding bars;
– In the case of multi-unit restorations: 2 holding bars at the end units (oral and vestibular); depending on the case provide further units with holding bars;
– In the case of multi-unit restorations with pronounced curvature: Sintering support structure in an even thickness (2–5 mm) recommended; in cases where the sintering structure is positioned vertically, place an additional vertical holding bar.

5. Place the product in the holder with the printed side facing up.
6. Mill the restoration.

3.2 Finishing restorations in unsintered state

NOTICE! Avoid any contact of unsintered zirconium oxide with unsuitable liquids or liquids that are not approved for zirconium oxide (e.g. unpurified water and/or lubricant coolant) and/or contact media (e.g. occlusion spray).
NOTICE! Bridge constructions must never be post-separated with a separating disc as this can cause fracture points at the connectors and reduce the strength of the all-ceramic restoration.
NOTICE! Carefully check restorations in the unsintered state for surface defects at the connectors (e.g. milling lines or small, milling-related indentations). Smooth such areas before sintering using a fine-grain rubber polisher to avoid stress stress concentrations and maintain mechanical stability.

1. Separate the holding bars.
2. Smooth out the attachment point.
3. Process the restoration with light pressure and low speed while adhering to the parameters, see Table 1.
4. Clean the restoration using a brush.
5. Remove any residue with dry, oil-free compressed air.

3.3 Optional infiltrating

NOTICE! Wear protective gloves and goggles during infiltration.
NOTICE! Use only colouring liquids that are approved for zirconium oxide.
NOTICE! Contamination promotes discolouration or clouding of staining liquids. Do not use colouring liquids if cloudiness or precipitates (e.g. sediments) are present.
NOTICE! To reduce the intensity of the colouring liquids, add IPS e.max Zirconia Diluter.
NOTICE! Use only metal-free brushes, tweezers and containers.
NOTICE! The colour intensity of the indicator may change during its lifetime. This does not affect the performance of the colouring liquid.

Prerequisites

– The restoration is free from dust and grease and milling residues.
– The restoration is completely dry.
– The metal-free brush/tweezers was/were cleaned with distilled water and dried with an absorbent cloth.

Brush infiltration technique for pre-shaded zirconium oxide

1. Saturate brush No. 1 or No. 3 with IPS e.max Zirconia Effect Liquids.
2. Remove excess liquid by wiping the saturated brush along the edge of the container.
3. Apply IPS e.max Zirconia Effect Liquids individually on the cervical/incisal/occlusal areas of the restoration.
4. Optional: Repeat the steps 1 to 3.
5. Saturate brush No. 5 with IPS e.max Zirconia Color Liquids.
6. Remove excess liquid by wiping the saturated brush along the edge of the container.
7. Apply IPS e.max Zirconia Color Liquids individually on the cervical/dentin-coloured/occlusal areas of the restoration.
8. Thoroughly dry the inner and outer surfaces of the restoration with an absorbent cloth.
9. Optional: Temporarily place the restoration on a glass or plastic plate.
10. Before sintering, allow the restoration to dry in a drying cabinet at 80 °C for 15 minutes.

Brush infiltration to mask discoloured abutments or metal substructures

1. Saturate brush No. 5 with IPS e.max Zirconia Effect Liquid Opaque.
2. Remove excess liquid by wiping the saturated brush along the edge of the container.
3. Apply the colouring liquid evenly to the entire inner surface of the restoration one to two times.
4. Thoroughly dry the inner and outer surfaces of the restoration with an absorbent cloth.
5. Optional: Temporarily place the restoration on a glass or plastic plate.
6. Before sintering, allow the restoration to dry in a drying cabinet at 80 °C for 15 minutes.

3.4 Sintering the restoration

NOTICE! Observe the following parameters:

	Temperature 1 [°C]	Temperature 2 [°C]	Heating rate [°C/min]	Holding time [min]
Heating phase	20	900	10	-
Holding phase	900	900	-	30
Heating phase	900	1450	3	-
Holding phase	1450	1450	-	120
Cooling phase	1450	900	10	-
Cooling phase	900	300	8	-
Switch off				

Table 2: Standard program for crowns/bridges with up to 14 units

	Temperature 1 [°C]	Temperature 2 [°C]	Heating rate [°C/min]	Holding time [min]
Heating phase	20	950	90	-
Heating phase	950	1350	30	-
Heating phase	1350	1450	50	-
Holding phase	1450	1450	-	10
Cooling phase	1450	1100	50	-
Switch off				

Table 3: Speed program for crowns/bridges with up to 3 units

	Temperature 1 [°C]	Temperature 2 [°C]	Heating rate [°C/min]	Holding time [min]
Heating phase	20	950	50	-
Heating phase	950	1350	25	-
Heating phase	1350	1460	35	-
Holding phase	1460	1460	-	30
Cooling phase	1460	1100	25	-
Cooling phase	1100	300	10	
Switch off				

Table 4: Speed program for crowns/bridges with up to 14 units

✓ The restoration is completely dry.

1. Place the restoration on the sintering tray, centered within the sintering furnace.
2. Sinter the restoration according to the parameters in Tables 2–4.

3.5 Adjusting the restoration

NOTICE! Make changes to sintered restorations only if absolutely necessary.

NOTICE! Bridge constructions must never be post-separated with a separating disc as this can cause fracture points at the connectors and reduce the strength of the all-ceramic restoration.

1. If absolutely necessary: Prepare restoration using suitable grinding instruments (see Instructions for Use) at low pressure and low speed.
2. Prepare the individual microtexture using diamond grinding instruments.
3. Optional: Blast the restoration with aluminium oxide (Al_2O_3) 25–70 µm at 1 bar pressure or 70–110 µm at 1.5 bar pressure.
4. Smooth the incisal and occlusal contact points and the basal side of the bridge connectors using rubber polishers.
5. Thoroughly clean the restoration with running water or the steam jet.
6. Remove any residue with dry, oil-free compressed air.
7. Check the restoration for defects and cracks.
8. Optional: Finish the restoration using the staining, cut-back or layering technique.

3.6 Preparing the restoration for cementation

1. In the case of zirconium oxide surfaces in contact with the gingiva: Polish the surfaces.
2. Blast the inner surfaces of the restoration with aluminium oxide (Al_2O_3) 25–70 µm at 1 bar pressure or 70–110 µm at 1.5 bar pressure.
3. Thoroughly clean the restoration with running water or the steam jet.
4. Remove any residue with dry, oil-free compressed air.

3.7 Bonding the restoration to the titanium base

1. Condition the bonding surface of the titanium base according to the manufacturer’s instructions.
2. Clean the bonding surface of the restoration and the titanium base with alcohol or steam.
3. Cover the internal hex head of the abutment screw with wax.
4. Bond the restoration to the titanium base. Observe the instructions for use of the bonding material.

4 Chairside use

Prepare the tooth according to established preparation guidelines.
1. Prepare no angles or edges.
2. The ideal preparation is a shoulder preparation with rounded inner edges or a chamfer preparation at an angle of 4–8 degrees.
3. Prepare tooth while adhering to the minimum wall thicknesses, see Table 1.
4. For conventional or self-adhesive cementation: Prepare retentive surfaces (with a preparation height of at least 4 mm).

Restorations made from IPS e.max Zirconia can be cemented using conventional, self-adhesive or adhesive techniques.
NOTICE! Observe the recommended cementation methods based on the type of restoration:

	Conventional	Self-adhesive	Adhesive
Crown	X	X	X
Bridge	X	X	X
Inlay	-	-	X
Onlay	-	-	X
Veneer	-	-	X
Cantilever bridge	-	-	X
Adhesive bridge	-	-	X
Hybrid structure and hybrid crown	-	-	X

5. Cement the restoration. Observe the instructions for use of the bonding material.
6. Check static and dynamic occlusion.
7. Polish the adjusted contact points.

5 Safety information

– The material has been developed solely for use in dentistry. Processing should be carried out strictly according to the Instructions for Use.
– In the case of serious incidents related to the product, please contact Ivoclar Vivadent AG, Bendererstrasse 2, 9494 Schaan/ Liechtenstein, www.ivoclar.com and your responsible competent authority.
– During finishing, grinding dust may be generated. Grinding dust can be harmful to health. Do not inhale grinding dust. Use an extraction unit and wear protective goggles and a face mask. Wear protective gloves.
– Before use, visually inspect the packaging and the product for damage. In case of any doubts, please contact Ivoclar Vivadent AG or your local dealer.

Residual risks
Users should be aware that any dental intervention in the oral cavity involves certain risks.
The following clinical residual risks are known:
– Chipping/fracture/decementation of the restorative material may lead to accidental swallowing or inhalation and the need for dental retreatment.

5.1 Supporting documents

Document	To be found:
Current version of Instructions for Use	
Structure of Instructions for Use and Warnings	
Explanation of symbols	
Safety Data Sheet (SDS)	
Summary of Safety and Clinical Performance – SSCP	
Basic UDI-DI:	

6 Shelf life and storage

IPS e.max Zirconia discs:
– Store the product in its original packaging.
– Protect the product from impacts or unbuffered vibrations.
– Store the product in a dry place.

IPS e.max Zirconia Color Liquid:
– Storage temperature: 2–28 °C
– Date of expiration: See note on packaging

6.1 Disposal information
Remaining stocks must be disposed of according to the corresponding national legal requirements.

7 Legal information

– Keep material out of the reach of children.
– Prior to use, the product must be inspected under the user's responsibility for integrity and suitability.
– All procedures involving the patient must exclusively be performed by qualified dental professionals.
– The manufacturer assumes no liability for any damage caused by use in restoration types not intended by the manufacturer.
– Any liability and warranty claims become void in the event of damage resulting from improper use or use not in accordance with the intended purpose.

8 Defects and damages

In case of defects or damages, please contact Ivoclar Vivadent AG, Bendererstrasse 2, 9494 Schaan, Principality of Liechtenstein.