sagemax®

Instructions for use

NexxZr® S
NexxZr® T
NexxZr® T Multi
NexxZr®+
NexxZr®+ Multi

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Table of Contents

Material Properties

NexxZr® discs are made of Zirconium Oxide (Y-TZP ZrO_2) for dental applications. This material is specifically made for manufacturing of permanent dental prosthesis. Applications include: Anterior, posterior crown and bridges, conical telescopic copings. After completion of the specified final sintering all Sagemax NexxZr zirconia meets the requirements of EN ISO 6872.

Technical Data

Composition

Material	NexxZr S	NexxZr T	NexxZr T Multi	NexxZr+	NexxZr+ Multi
Zirconium oxide ZrO_2	≥ 89 %	≥ 89 %	≥ 88 %	≥ 85 %	≥ 86 %
Yttrium oxide + Y_2O_3	4 – 6 %	4 – 6 %	4 – 7 %	7 – 9 %	6.5 – 8 %
Hafnium oxide HfO_2	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %	≤ 5 %
Aluminium oxide Al_2O_3	< 1 %	< 1 %	< 1 %	< 1 %	< 1 %
Chemical solubility (µg / cm²)	< 100	< 100	< 100	< 100	< 100

Properties

Material	NexxZr S	NexxZr T	NexxZr T Multi	NexxZr+		NexxZr+ Multi
				white	shaded	
Linear thermal expansion / CTE [(10^{-6} K^{-1})	10.1 ≤ CTE* ≤ 11.1 (*span 25 – 500°C)	10.1 ≤ CTE* ≤ 11.1 (*span 25 – 500°C)	10.0 ≤ CTE* ≤ 11.0 (*span 25 – 500°C)	9.6 ≤ CTE* ≤ 10.6 (*span 25 – 500°C)		9.9 ≤ CTE* ≤ 10.9 (*span 25 – 500°C)
Biaxial flexural strength (MPa)[1]	1,370	1,270	1,170	1000	880	880
Fracture Toughness ($MPa*m^{1/2}$)[1]	≥ 5	≥ 5	≥ 5	≥ 3.5	≥ 3.5	≥ 3.5
Translucency (1-CR)*100	30 %	42 %[2]	42 %	46 %[2]	46 %[2]	46 %
Type / Class	Type II / class 5	Type II / class 5	Type II/class 5	Type II / class 5	Type II / class 4	Type II / class 4

1 Typical values acc. to EN ISO 6872 (polished specimen)
2 Pre-shaded discs show lower values

Safety Data Sheet (SDS)

Hazardous Ingredients

Zirconia (Zirconium Oxide)	
CAS Number	1314-23-4
Percent	91 – 96 %
ACGIH TLV	5 (T)
OSHA PEL	5 (T)
Units	mg / m³
Yttria (Yttrium Oxide)	
CAS Number	1314-36-9
Percent	4 – 9 %
ACGIH TLV	5 (T)
OSHA PEL	5 (T)
Units	mg / m³

Health Hazard Data

Routes of Exposure:
X Skin Contact
N/A Skin Absorption
X Eye Contact
X Acute Inhalation
X Chronic Inhalation
X Ingestion

Emergency and First Aid Procedures

- **Inhalation:** If symptoms of pulmonary involvement develop (coughing, wheezing, shortness of breath, etc.) remove from exposure and seek medical attention.
- **Skin / Eye Contact:** If irritation occurs, flush with large amounts of water. If irritation persists, seek medical attention.
- **Ingestion:** If substantial quantities are swallowed, dilute with a large amount of water. Induce vomiting and seek medical attention.

Warranty / Storage

Warranty

- Technical information and user recommendations, whether given orally or in writing, as well as practical training are guidelines.
- Sintering ovens vary in their performance. It is extremely important that furnaces be calibrated on a regular basis to achieve optimum results. Follow the manufacturer's recommended calibration instructions.
- Our products are subject to continuous development and improvements. We will advise you of these changes.
- We strive to provide the best quality products. Upon receipt inspect the product for any visual defects prior to milling.
- After discs and blocks have been partially milled, complaint claims will be voided.

Storage

Store all NexxZr zirconia in its original packaging in a dry environment at normal room temperature.

Application / Design and Milling

Indications For Use

Indication	NexxZr S	NexxZr T	NexxZr T Multi	NexxZr+		NexxZr+ Multi
				white	shaded	
Single unit restorations (anterior / posterior)	✓	✓	✓	✓	✓	✓
3-unit bridges (anterior / posterior)	✓	✓	✓	✓	✓	✓
Multi-unit bridges (anterior / posterior)	✓	✓	✓	✓	x	x

› **For use in Canadian market only:** Bridge to be limited to 6 units with a maximum of 2 pontics.

Contraindications

› Insufficient tooth structure reduction.
› Insufficient tooth structure for proper adhesion and force distribution.
› Insufficient oral hygiene.
› Insufficient interproximal space for sufficient joints in bridges.
› Known allergies.
› Known incompatibilities to product composition.

Design and Milling

› Follow instructions for CAD / CAM software to scan and design restorations.
› Milling systems need to be calibrated for best results. All systems are not alike and can produce adverse results if the minimum thickness is not followed.
› For bridges, always design auxiliary supports to prevent warping during sintering.

Infiltration

Infiltration of NexxZr restorations before sintering

› Please follow the respective Instructions For Use of the supplier.

Warning!

› User must take precautions when handling green state zirconia. Always work in a well-ventilated environment.
› Use synthetic gloves when handling zirconia and pre-stain liquids.
› Pre-stain liquids should not come in contact with skin.
› It is recommended to wear gloves, safety goggles and suitable protective clothing.
› Use appropriate vacuum in a well-ventilated area to capture and contain dust.

Sintering Recommendations

Sintering ovens vary in their performance. It is extremely important that furnaces be calibrated on a regular basis to achieve optimum results.

NexxZr S, NexxZr T, NexxZr⁺

	Number of units	Duration	Phase	Temperature	Heating/ Cooling rate	Temperature	Heating/ Cooling rate	Holding time
		h		°C	°C/min	°F	°F/min	min
Standard	1–5	~3.7	1	20–1,300	30	68–2,732	54	30
			2	1,300–1,530	40	2,732–2,786	72	60
			3	1,530–900	15	2,786–1,652	27	–
			4	900–80	20	1,652–176	36	–
	5–10	~5.2	1	20–1,300	30	68–2,732	54	60
			2	1,300–1,530	40	2,732–2,786	72	120
			3	1,530–900	15	2,786–1,652	27	–
			4	900–80	20	1,652–176	36	–
Long	1–20	10.7	1	20–900	10	68–1,652	18	10
			2	900–1,530	3	1,652–2,786	5.4	150
			3	1,530–80	8	2,786–176	14.4	–
	>21	11.7	1	20–900	10	68–1,652	18	10
			2	900–1,530	3	1,652–2,786	5.4	210
			3	1,530–80	8	2,786–176	14.4	–
Over night	unlimited	~14.3	1	20–250	2	68–482	3.6	–
			2	250–1,530	4	482–2,786	7.2	240
			3	1,530–80	8	2,786–176	14.4	–

NexxZr⁺ Multi, NexxZr T Multi

	Number of units	Duration	Phase	Temperature	Heating/ Cooling rate	Temperature	Heating/ Cooling rate	Holding time
		h		°C	°C/min	°F	°F/min	min
Speed	1–5	4.8	1	20–1,000	60	68–1,832	108	10
			2	1,000–1,530	3	1,832–2,786	5.4	60
			3	1,530–1,100	50	2,786–2,012	90	–
			4	1,100–80	60	2,012–176	108	–
Long	unlimited	9.6	1	20–900	10	68–1,652	18	30
			2	900–1,500	3	1,652–2,732	5.4	120
			3	1,500–900	10	2,732–1,652	18	–
			4	900–300	8	1,652–572	14.4	–

› Place objects to be sintered on beads in sintering tray.
› Space objects in tray to allow for convection heat.
› Fired objects will have a slight luster.

Warning!
› Sintering furnaces must be located in a fireproof well-ventilated area.
› Slow cooling is essential to the final outcome; do not cool too fast.
› Opening the furnace too early may cause zirconia to crack.

Sandblasting / Post Processing

Frame Fitting
After final sintering, the zirconia restorations can be fit and shaped using suitable diamond grinding points. Use a water cooled lab turbine to prevent fractures. Margins can be thinned using a soft rubber abrasive wheels, especially designed for such use.

Sandblasting
After performing any adjustments, the object should be lightly sandblasted with pure white 50 µm corundum (aluminum oxide) at approximately 2.5 bars.

Re-sintering
After sandblasting and steam cleaning, the objects should be re-sintered in a porcelain furnace to seal any micro fractures that may have developed during grinding. Raise temperature at 40°C/min. to 1000°C. Hold in air for 5 minutes. Slow cool to room temperature. Restorations are now ready for veneering, staining, and glazing.

Warning!

- Any grinding performed on sintered zirconia should be carried out in well-ventilated areas.
- Do not inhale particle dust.
- Use appropriate vacuum units to capture dust.
- Use safety glasses when grinding and sandblasting.
- Sandblast only in approved units with vacuum.

Veneering / Staining and Glazing

Veneering
- A thin wash of bonding porcelain should be applied to the veneering surface and fired.
- Apply zirconia veneering porcelain as required.
- Follow manufacturer's recommendations for firing parameters.
- Follow technical information for coefficient of thermal expansion for zirconia as well as veneering porcelain coefficient.

Staining and Glazing
- Stain and glaze in thin layers to preferred luster.
- Use stains + glazes designed for use with zirconia.
- Use manufacturer's recommendations for firing parameters.

Post Processing by Dentist
When occlusal and proximal adjustments are required by the dentist it is recommended that fine diamond grinding points be used. The restoration should be cooled during the grinding process. Diamond grit size should be approximately 40 microns. After grinding, smooth areas with a rubber wheel and polish with 10 micron diamond polishing paste. Note that if the restoration is not sufficiently polished, the antagonist may experience abrasion over time.

Cementation

Conventional Cementation
The inherent properties of NexxZr zirconia give it maximum strength and stability. Therefore conventional fixation with zinc – oxide phosphate or glass ionomer cement is possible in most cases. Lightly sandblast internal of restoration with pure white 50 micron Aluminum Oxide and steam clean prior to cementation. When applying the conventional cementation technique, it is important to observe the correct requirements of abutment retention.

Adhesive Fixation
For adhesive fixation, we recommend the bonding composite SpeedCEM® Plus. These adhesive cements will create an excellent bond between tooth structure and the zirconium-oxide frame material.

Zirconia Fixation as a Provisional
Although not recommended, if a restoration needs to be placed temporarily, care must be taken during removal as frames can be subject to damage.

Manufactured by

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RX only
For dental use only

This material has been developed solely for use in dentistry and must be processed according to the Instructions. Liability cannot be accepted for damages resulting from misuse or failure to observe the Instructions. The user is solely responsible for testing the material for its suitability for any purpose not explicitly stated in the Instructions. This also applies when the materials are mixed with or used together with products from other companies.

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