

**sagemax**

Instructions for Use

**NEXZr.S**

**NEXZr.T**

**NEXZr<sup>+</sup>**

**NEXZr<sup>+</sup>MULTI**

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## 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 / Product	NexxZr S	NexxZr T	NexxZr +	NexxZr + Multi
Zirconium oxide $ZrO_2$	≥ 89%	≥ 89%	≥ 85%	≥ 86%
Yttrium oxide + $Y_2O_3$	4 – 6%	4 – 6%	7 – 9%	6.5 – 8%
Hafnium oxide $HfO_2$	≤ 5%	≤ 5%	≤ 5%	≤ 5%
Aluminium oxide $Al_2O_3$	< 1%	< 1%	< 1%	< 1%
Chemical solubility [ $\mu g/cm^2$ ]	< 100	< 100	< 100	< 100

### Properties

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

<sup>1</sup> Typical values acc. to EN ISO 6872 (polished specimen)

<sup>2</sup> 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/m <sup>3</sup>
Yttria (Yttrium Oxide)	CAS Number	1314-36-9
	Percent	4 – 9%
	ACGIH TLV	5 (T)
	OSHA PEL	5 (T)
	Units	mg/m <sup>3</sup>

## 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 NexZr zirconia in its original packaging in a dry environment at normal room temperature.

## Application / Design and Milling

### Indications For Use

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

	Number of units	Duration (h)	Phase	Temperature		Heating rate / Cooling rate		Holding time (min)
				°C	°F	°C/min	°F/min	
<b>NexxZr S, NexxZr T, NexxZr +</b>								
Standard	1 - 5	~3.7	Phase 1	20–1300	68–2372	30	54	30
			Phase 2	1300–1530	2372–2786	40	72	60
			Phase 3	1530–900	2786–1652	15	27	–
			Phase 4	900–80	1652–176	20	36	–
	5 - 10	~5.2	Phase 1	20–1300	68–2372	30	54	60
			Phase 2	1300–1530	2372–2786	40	72	120
			Phase 3	1530–900	2786–1652	15	27	–
			Phase 4	900–80	1652–176	20	36	–
Long	1 - 20	10.7	Phase 1	20–900	68–1652	10	18	10
			Phase 2	900–1530	1652–2786	3	5.4	150
			Phase 3	1530–80	2786–176	8	14.4	–
	>21	11.7	Phase 1	20–900	68–1652	10	18	10
			Phase 2	900–1530	1652–2786	3	5.4	210
			Phase 3	1530–80	2786–176	8	14.4	–
Over-night	unlimited	~14.3	Phase 1	20–250	68–482	2	3.6	–
			Phase 2	250–1530	482–2786	4	7.2	240
			Phase 3	1530–80	2786–176	8	14.4	–
<b>NexxZr + Multi</b>								
Speed	1 - 5	4.8	Phase 1	20–1000	68–1832	60	108	10
			Phase 2	1000–1530	1832–2786	3	5.4	60
			Phase 3	1530–1100	2786–2012	50	90	–
			Phase 4	1100–80	2012–176	60	108	–
Long	unlimited	9.6	Phase 1	20–900	68–1652	10	18	30
			Phase 2	900–1500	1652–2732	3	5.4	120
			Phase 3	1500–900	2732–1652	10	18	–
			Phase 4	900–300	1652–572	8	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 and 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.







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**RX only**

**For dental use only**

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EN

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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