

# Instruction Manual

English

For:

NEX<sup>X</sup>Zr™ T

NEX<sup>X</sup>Zr™ S

CE 0086

NexxZr™, The Next Generation of Dental Zirconia

sagemax®



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# Material Properties

Sagemax NexxZr™ discs and blocks are made of Zirconium Oxide (Y-TZP ZrO<sub>2</sub>).

For Type II, Class 6 dental applications in accordance with ISO 6872, (DIN EN ISO 6872), this material is specifically made for manufacturing of permanent and removable dental prosthetics.

Applications include: Crown and bridges, conical telescopic copings, veneers, inlays and onlays.

After completion of the specified end sintering all Sagemax NexxZr™ Zirconia meets the requirements of ISO 6872:2009-01.

## Technical Data

Properties	Unit	NexxZr™T Value	NexxZr™S Value
Bending Strength(biaxial):	MPa	1,100 ± 100	1,300 ± 100
CTE:		10x10 <sup>-6</sup> K <sup>-1</sup> (25-500°C)	10x10 <sup>-6</sup> K <sup>-1</sup> (25-500°C)

## Chemical Composition

Components	Percent Mass Fraction	Percent Mass Fraction
ZrO <sub>2</sub> + HfO <sub>2</sub> + Y <sub>2</sub> O <sub>3</sub>	> 99.1	>99.1
ZrO <sub>2</sub>	> 91.0	>91.0

# Material Safety Data Sheet (MSDS)

## Chemical Product & Identification

Chemical Family	Zirconium Oxide Based Ceramics
Trade Name	Sagemax NexxZr™ Dental Zirconia Blank

## Hazardous Ingredients

Zirconia (Zirconium Oxide)	CAS Number	13314-23-4
	Percent	94-96
	ACGIH TLV	5 (T)
	OSHA PEL	5 (T)
Yttria (Yttrium Oxide)	Units	mg/m <sup>3</sup>
	CAS Number	1314-36-9
	Percent	4-6
	ACGIH TLV	2 (T)
	OSHA PEL	N/E
Units	mg/m <sup>3</sup>	

## Health Hazard Data

Routes of Exposure:

<input checked="" type="checkbox"/> Skin Contact	<u>N/A</u> Skin Absorption	<input checked="" type="checkbox"/> Eye Contact
<input checked="" type="checkbox"/> Acute Inhalation	<input checked="" type="checkbox"/> Chronic Inhalation	<input checked="" type="checkbox"/> 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 Contact

If irritation occurs, flush with large amounts of water. If irritation persists, seek medical attention.

### 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, so it is highly recommended the users calibrate periodically to ensure the recommended cycle is carried out correctly. 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 Sagemax NexxZr<sup>®</sup> Zirconia in its original packaging in a dry environment at normal room temperature.

## Indications for use

- NexxZr T: Full contour monolithic crowns and bridges in anterior and posterior regions. Bridge to be limited to 6 units with a maximum of 2 pontics.
- NexxZr T: Anatomically reduced for veneering, crown and bridges in anterior and posterior regions. Bridge to be limited to 6 units with a maximum of 2 pontics.
- NexxZr S: Anatomically reduced for veneering, crown and bridge frames. 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.
- Heavy discoloration of prepped tooth structure.

## Design and Milling

Follow instructions for CAD/CAM software to scan and design restorations.

Sagemax materials should be used in accordance with the design and recommended parameters.

Milling systems need to be well 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.

# Pre-Staining Recommendations

## Pre-Staining

Dry milling is preferred, but if wet milling, a clean cycle must be performed.

- Thoroughly wash off any milling lubricants and place objects on soft firing pillow.
- Place in warm oven to 500 ° C for 5 minutes.
- Cool to room temperature.

We recommend water and alcohol based pre-stains.

- Follow manufacturer's instructions.

The stained chroma will vary depending on the stain concentration, the number of applied layers and, or immersion time.

- The use of acid based stains is not recommended.
- Mixing and matching stains from different manufacturers is not recommended.



## 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.
- Use appropriate vacuum in a well-ventilated area to capture and contain dust.



## Drying

It is important that Sagemax NexxZr™ Zirconia be completely dried prior to sintering. Even if the surface appears dry, the internal structure may not be completely dry. Insufficiently dried or damp zirconia may form cracks during sintering.

- For single units, pre dry using an external heat source. For example: a hairdryer or heat lamp at a low setting. Be careful to not rapidly dry objects.
- For bridges, use a similar method but extend the dry time. Be careful to dry slowly and thoroughly, until all moisture has dissipated.



## WARNING

- Work area must be well-ventilated.
- Acid based stains may cause toxic vapors when drying.
- Insufficiently dried zirconia may cause cracking.

# Sintering Recommendations

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

Stage	Program	Rate/Minute	Time (Minutes)	Units in Furnace
1	Room Temperature ~ 250°C	2 °C/Minute	115	
2	250 ~ 1520°C	6 °C/Minute	212	1--5
		5 °C/Minute	254	6--10
		4 °C/Minute	318	11--15
		3 °C/Minute	423	16--50
3	1,520°C ~ 1,520°C	0°C/Minute	120	1~10
			150	11~50
4	1,520°C ~ 80°C	Natural Cooling		

- NexxZr T and NexxZr S are sintered using the same program.
- 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.

## 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 50µm corundum (aluminum oxide) at approximately 2.5 bars.

## Re-sintering

After sandblasting and steam cleaning, the objects should be re-sintered in the 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.



## 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 / Stain 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 polish paste.

Note that if the restoration is not sufficiently polished, the antagonist may experience abrasion over time.

Refer to manufacturer's instructions for final polish.

## **Conventional cementation:**

The inherent properties of Sagemax NexxZr<sup>®</sup> 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 Panavia<sup>®</sup>21 or Panavia<sup>®</sup>F 2.0, Rely X<sup>®</sup>. 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.

# Technical Support

ENGLISH

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