

Innovation Reflects the Future



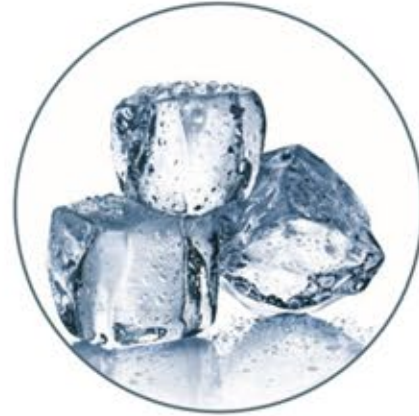
Swedish Design and Quality

Erran Self-Glazed Zirconia[®]

Dentist Handbook



Erran Self-Glazed Zirconia[®] Restorations
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**A new kind of nano-structure gradient zirconia restorations
with natural enamel-like smooth texture**

— Erran Self-Glazed Zirconia®

The same chemical components but different microstructure result in different properties,
like water and ice.



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Swedish Design, Milestone of All-ceramic Dental Restorations
Scientifically Proven Smart Choice
Dream of Customized All-ceramics

Swedish design, Milestone of All-ceramic Dental Restorations

1989 Procera®

-the first generation of All-ceramic Dental Restorations Designed in Sweden

"In the past, dental crowns were all handmade at a low-efficiency and the quality was not controllable. In 1983, my colleagues and I introduced computer numerical control (CNC) technology into dental prosthodontics. The first generation of CAD/CAM dental prosthesis-Procera was successfully developed after six years. Its advent proclaimed that prosthodontics entered into all-ceramic era from porcelain fused metal era. After thirty years, my colleague, Professor James Shen developed an innovative material and manufacturing processes, and upgraded Procera system. This is the Self-Glazed Zirconia Restorations®. I believe Self-Glazed Zirconia Restorations, as a new generation of all-ceramic restorations, will boost the revolution of restorative dentistry."

- Professor Dr Matts Andersson
Inventor of Procera® system



Professor Matts Andersson and Professor James Shen organized the first academic activity of Procera system in Beijing, China in 2004.

2013 Self-Glazed Zirconia®

—the second generation of All-ceramic Dental Restorations Designed in Sweden

"Procera® is the first all-ceramic dental restoration system in dentistry. More than thirty years clinical application not only validates its excellent performance, but also verifies the inevitable trend of completely digital prosthodontics.

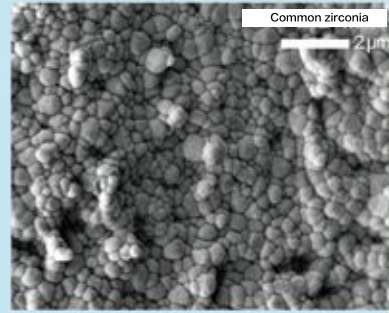
Bio-mimicking the natural tooth is the requirement of prosthesis. This research and development power originated from the requirements of doctors and patients leads us to keep on moving. In the Arrhenius laboratory at Stockholm University, we have successfully developed a new generation of all-ceramic dental restorations, named Self-Glazed Zirconia Restorations. By mimicking the smooth texture and gradient structure of natural tooth, we made a breakthrough of the all-ceramic dental restorations' performance. At the same time, the natural Self-Glazed Zirconia Restorations firstly realized the completely digital manufacturing. There is no manual work during the whole process and thus Self-Glazed Zirconia becomes the representative of completely prosthodontics era (CDD/CDM)."

- Professor Dr James Shen
Inventor of Self-Glazed Zirconia Restorations

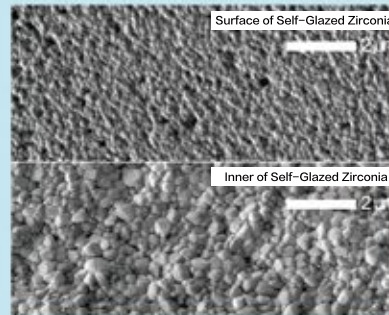
Scientifically Proven Smart Choice

Finer nano-gradient structure

In the high-resolution scanning electron microscope, we found that common dental zirconia does not have a gradient structure. During manufacturing processes of customized dental restorations, twice of high-temperature sintering are involved. Grain size is large (about 300nm in average), and inhomogeneous.

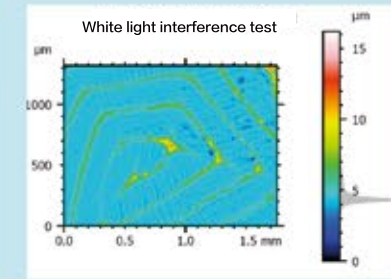


Nano-gradient structure of Self-Glazed Zirconia Restorations is apparent in the high-resolution scanning electron microscope. Just one rapid temperature sintering is needed during the whole processes, which effectively controlled the grain growth. Grains of Self-Glazed Zirconia Restorations are round and uniform. Grains inside are about 250nm, and the surficial grains are only about 150nm.

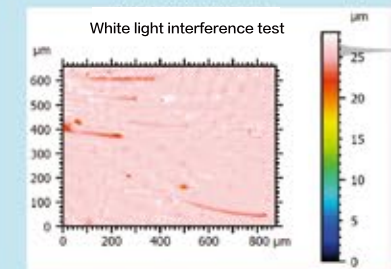


Finer nano-gradient structure

Common zirconia restorations are made by "subtraction" process, in which customized dental crowns were milled from pre-sintered zirconia blanks. During milling, this brittle material chips seriously leaving series of milling tracks on the rough surface. So the dental crown looks rough, bleak, and cannot be applied in clinic directly. At the same time, the efficiency of grinding and polishing this kind of zirconia restorations is very low and thus take a lot of chairside time. Due to this, dentists always complaint that zirconia is hard to be ground or polished.

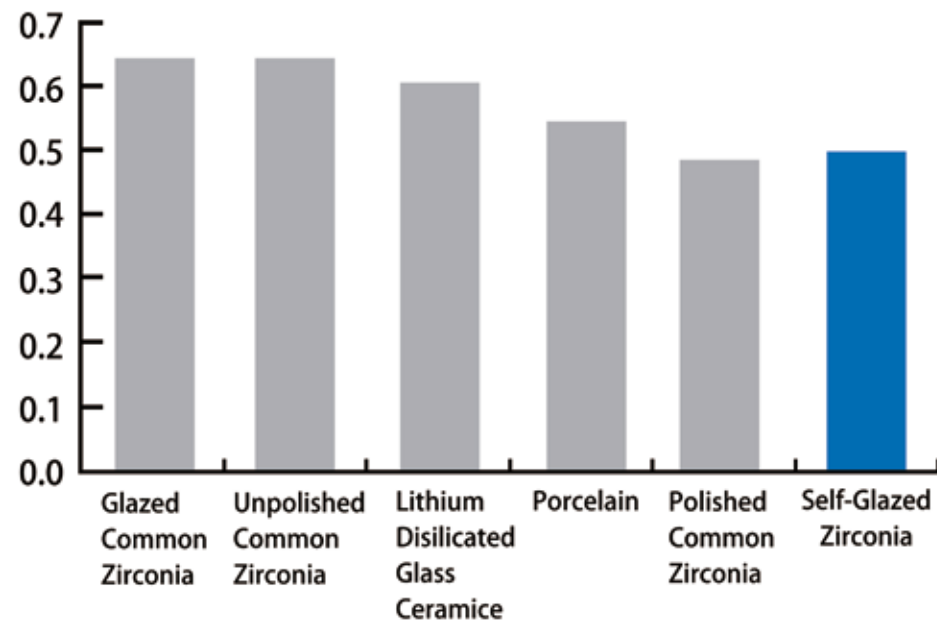


Self-Glazed Zirconia Restorations are made by the innovative "addition" process, in which 3D colloidal deposition technology was used to produce personalized prosthesis. The enamel-like "scaly" microstructure formed on the surface has made the Self-Glazed Zirconia Restorations smooth and soft. This new kind of restorations could be applied in clinic directly without any glazing or polishing. When adjusting the softened surface of Self-Glazed Zirconia Restorations, it is much easier than common zirconia. The efficiency of grinding will be increased by 20%.

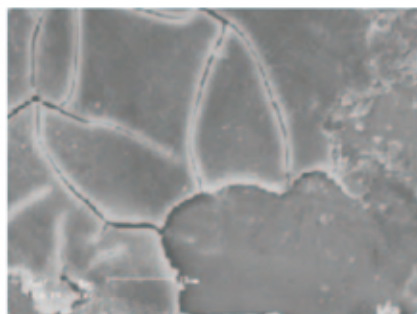


■ Safer wear properties

Ideal dental restorative material should be wear-resistant, and will not result in excessive wear of opposite natural teeth. Among all ceramic restorative materials on the market, Self-Glazed Zirconia and fine polished common zirconia have the best wear resistance, and the smallest friction coefficient, which represents the most secure friction and wear properties; second is porcelain; and lithium desilicated glass ceramics, while unpolished common zirconia and glazed common zirconia might lead to excessive wear of natural teeth.



Glazed Common Zirconia ≠ Self-Glazed Zirconia

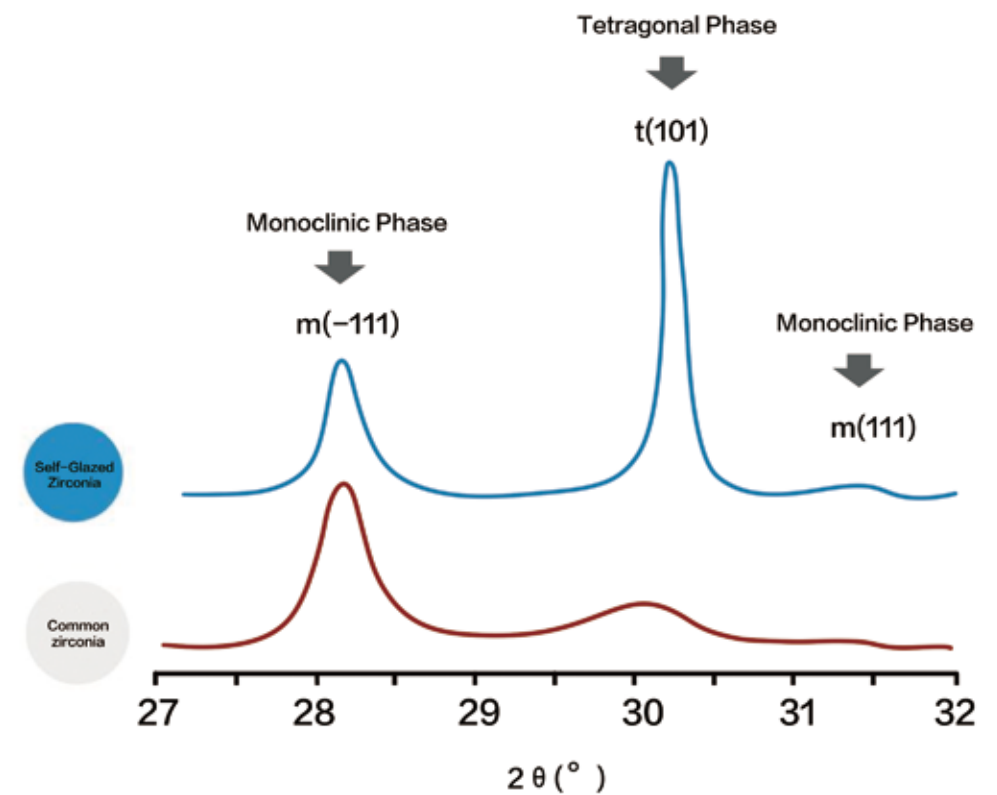


Rough surface of glazed common zirconia after chewing. Glaze layer will be worn off within 3 to 6 months. After that, chewing procedure with natural tooth, rough zirconia, and food mixed with the sharp porcelain debris together, will result in excessive wear of natural teeth.

■ More reliability, long-term strength and toughness

Self-Glazed Zirconia is one of the strongest materials in whole ceramic family that shows strength over 1200 MPa. Moreover, since the quality control could be monitored during whole manufacturing processes, like from powder to colloidal then to final product, its reliability (based on internationally Weber modulus m , $m > 16$) is much higher than any other all-ceramic restorations ($m < 12$). Then the risk of quality fluctuation among different batches can be avoided.

Anti-aging properties of Self-Glazed Zirconia is excellent. After 20 hours aging treatment in lab (1 hour aging treatment in vitro is equivalent to 3 years in vivo), the amount of phase transformation is half of the polished common zirconia, which means that after 60 years of use in the mouth, the residual strength of Self-Glazed Zirconia is at least twice as that of the polished zirconia.



■ Better aesthetics

A series of unique colored raw materials were developed based on the precision analysis of the complex color of natural tooth. The color of Self-Glazed Zirconia Restorations is homogeneous and natural, which eliminates the inhomogeneous look made by immersion shading, and also avoids the risk of exposing white coping after grinding the glazed and stained common zirconia. Self-glazed Zirconia has rich colors. The dental technician will change the complicated operations into "finishing touch", creating the patient's perfect smile easily by slightly veneered aesthetic Self-Glazed Zirconia Restorations.



By use of series of colored raw materials, Self-Glazed Zirconia Restorations could precision reproduce the 16 color effects according to Classic Vita shade guide through completely digital manufacturing way.

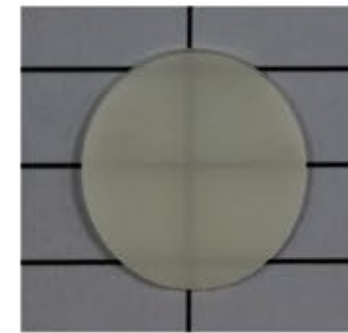
Innovative 3D colloidal technology realized mimicking the multi-layer gradient color of natural teeth. Different from the commercial multi-color zirconia blocks, this innovative technology can create the gradient multi-colors, while simultaneously producing the customized geometry of the dental restorations. Especially when producing multi-unit fixed partial denture with Self-Glazed Zirconia, each unit could obtain different color without any manual work, which cannot be realized by using any material or techniques currently available on the market.



Combination of series of colored raw materials and 3D colloidal forming technique, Self-Glazed Zirconia Restorations could reproduce the natural appearance of tetracycline teeth which has complicated color ribbons. On this basis, minimal veneering will create a natural aesthetic effect.

■ Richer translucency effect

On the one hand, due to the finer nano-structure and smoother natural surface, Self-Glazed Zirconia records the transparency of all dental ceramic materials, including glass ceramics. The Real in-line transmission of 0.5 mm, Self-Glazed Zirconia reached 25%. Ultra-translucent Self-Glazed Zirconia with opalescent effect can be used to restore the natural color of teeth, particularly in the minimally invasive enamel veneer.



On the other hand, a new product "Low Translucency Self-Glazed Zirconia" could provide excellent opaque effect even the thickness is very thin. It further expands the indication of all-ceramic restoration. Especially when the amount of tooth preparation is limited, low translucency Self-Glazed Zirconia is not only effective to cover the inner color, but also could further reduce the requirement of veneering benefit of its own dentin-like color. Then the severely discolored teeth, metal posts and abutment could be restored with all-ceramics.



Severe dental defects with root canal therapy (RCT) were restored with metal posts and cores; ultra-thin low translucency Self-Glazed Zirconia copings with partial anatomy could cover the metal color effectively. Combined with minimal veneering, natural aesthetic appearance could be obtained.

More advanced, completely digital restoration

Completely Digital Design & Completely Digital Manufacture (CDD / CDM) is a new concept and technology of digital restoration. Compared to computer-aided design and manufacture (CAD / CAM), CDD / CDM emphasizes more on digitalizing the whole process. Not only clinical diagnosis and treatment will transfer more accurate information in more convenient digital way, but also the manufacturing process will be fully digitalized. Except minimal veneering for the highly personalized aesthetic needs, the process does not include any manual operation. Its significance lies not only on cancelling the last step by manual operation (such as polishing, glazing) to improve manufacturing efficiency, but also on the whole digital process that will ensure the high quality, precision and reliability of the product.

Ultra-thin Self-Glazed Zirconia

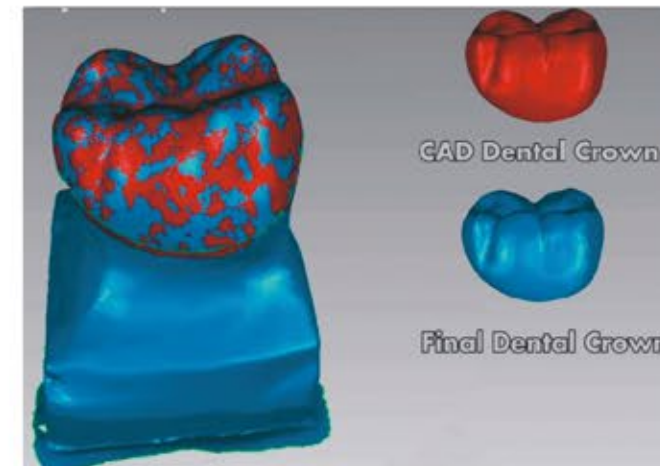
In CDD / CDM concept, the benefit from innovative materials and technology and advanced intelligent manufacturing system realizes the "Net-shape Manufacturing" of ultra-thin Self-Glazed Zirconia Restorations. The minimum thickness of Self-Glazed Zirconia dental crown is only 0.3 mm, and it is 0.15 mm for ultra-thin veneers. It could greatly reduce the requirement of tooth preparation, while assisting minimum invasive cosmetic restoration. Different from the other ultra-thin prostheses on the market, the ultra-thin Self-Glazed Zirconia Restorations are made completely by digital processes, rather than manual grinding for thinning.



Ultra-thin Self-Glazed Zirconia dental crown (0.3 mm) made by net-shape manufacturing.

Precise and reliable

Self-Glazed Zirconia Restorations is the first and currently is the only one customized all-ceramic dental restorations made in completely digital way. The manufacturing accuracy is up to 10 μm . Benefiting from the high precision, clinical adjustment of Self-Glazed Zirconia Restorations reduced, and the efficiency improved. Chairside operating time will be saved more than 30%. At the same time, the excellent marginal adaptation of Self-Glazed Zirconia Restorations reduced the risk of secondary caries and soft tissue inflammation due to the uncontrollable gap between prosthesis and abutment.



Advanced digital quality inspection. Through matching the designed data and the scanned final product high degree of overlap between them confirmed that manufacturing precision of Self-Glazed Zirconia is excellent.

Self-Glazed Zirconia Restorations Assisting Minimally Invasive Cosmetic Dentistry



Before restoration of dental fluorosis



After the restoration of dental fluorosis



Self-Glazed Zirconia partial anatomy copings with dentin color



Aesthetic Self-Glazed Zirconia crowns

"The patient was a young dental nurse. 12-22 fluorosis after root canal therapy cannot be restored by conventional all-ceramic restorations since the tooth preparation in the lingual side was limited due to the tight bite. If reluctantly, there would be risk of chipping. Aesthetic Self-Glazed Zirconia Restorations combine aesthetics and functions together. For the dentin color partial anatomy coping, the thickness of lingual side was only 0.3 mm, and the smooth surface without any glazing could protect the opposite natural teeth from excessive wear; minimal veneering on the labial and mesial-distal surfaces by dental technicians could create natural aesthetic effects."

-Dr Dong Han, Associate professor, Vice chief physician
Peking University Stomatology Hospital



Healing abutment

Permanent abutment

After implant restoration



Self-Glazed Zirconia Crown and permanent abutment



Self-Glazed Zirconia Restorations assisting precision implant restoration

"Patient was an elder female. She chose implants to restore her missing teeth. For the upper structure, considering chipping risk of porcelain fused to metal/ceramic crowns with occlusal holes; inhomogeneous color of common zirconia crown and the exposed white color after grinding; and excessive clinical adjustment or even reproduction due to the uncontrollable marginal integrity and precision. Thus we tried novel Self-Glazed Zirconia dental crowns. These new completely digitally crowns could obtain perfect geometry and aesthetic effect without any manual operation; in particular, its excellent marginal adaptation lays the foundation of long-term success. We decided to continue the restoration with implants and Self-Glazed Zirconia Restorations."

-Dr Dong Peng, Chief Physician
Beijing Best care Dental Clinic

**Erran Self-Glazed Zirconia Restorations
Swedish Design and Quality**