

Zirconia New Dimensions

STM_{Machine}

Zirconia Surface Transition Machine



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STM Product Feature

STM

A mechanism and machine that specially treats the surface of Zirconia. A new treatment method of Zirconia surfaces that maximizes the bonding strength by securing both micro- and macro-retention.



OS

windows 10,11
(64bit)

STM Software

STM Software is software dedicated for STM equipment, allowing users to select preset conditions for the characteristics of the prosthetic. Then, the program operates by simply clicking.

In addition to start and stop functions, the STM processing time, completion, and status are displayed intuitively, providing ease of use without requiring additional training of operators.



STM-Z

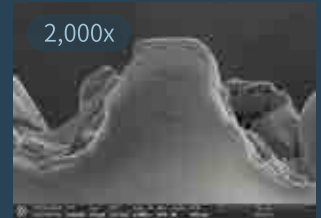
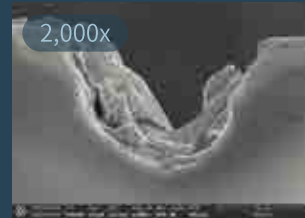
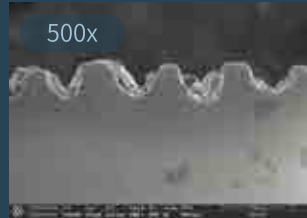
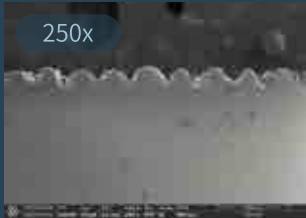
- Model : STM-Z
- Method : STM (Surface Transition Mechanism)
- Applicable Material : Zirconia, Titanium
- Cavity : 1 ea
- Size : 400(W) × 800(H) × 650(D) mm
- Weight : 50 kg
- Power : 100–240V (AC), 50–60 Hz
- Standard Package : Main Unit, STM Software, and Zirconia Disc Jig
- Optional Accessories : Dust Collector, Individual Jig, Abutment Jig, Dedicated Abutment Software, Equipment Stand, and Computer

Achieves
a bonding strength
of **40MPa** or higher

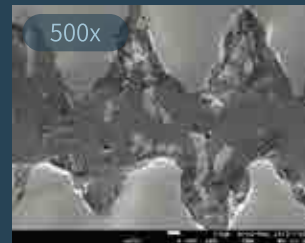
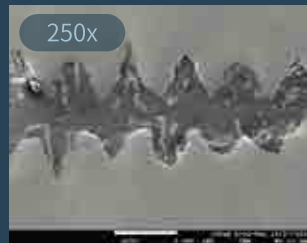
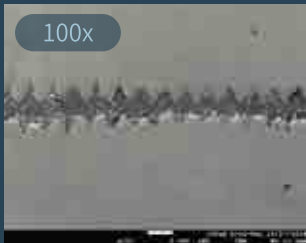
Provides Macro & Micro Retention

STM treatment of Zirconia surface

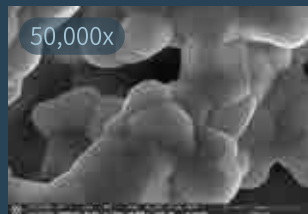
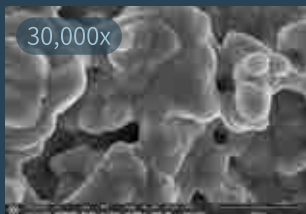
Macro Retention Cross-section



Macro Retention Adhesive Surface



Micro Retention



STM-treated Zirconia



Untreated Zirconia

Microscope image of Zirconia in white light

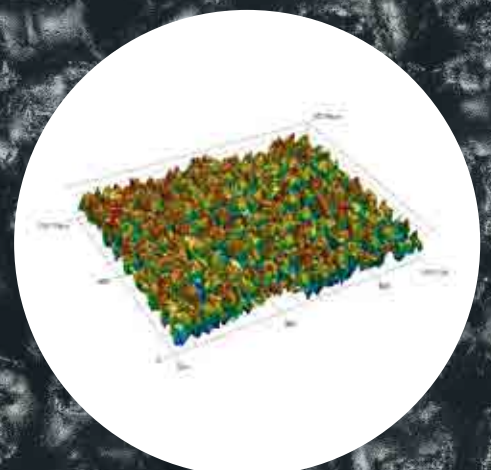




Image of contact angle (hydrophilicity) measurement

Image of water droplet
on untreated zirconia surface

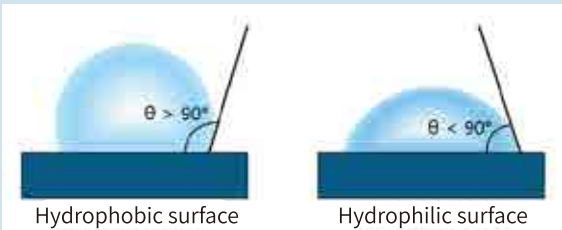


Contact angle: $78.2 \pm 8.0^\circ$

Image of water droplet
on STM-treated zirconia surface



Contact angle: $28.4 \pm 10.0^\circ$

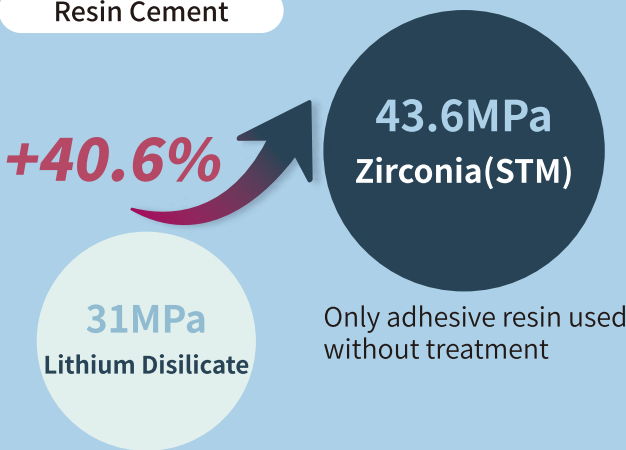


The contact angle of the water droplet on the STM-treated zirconia surface is lower, showing that a hydrophilic surface is formed.

Formation of a hydrophilic surface is essential for tight bonding

Shear Bonding Strength Test

Resin Cement



Zirconia Specimen Bonding Method
STM-treatment and no additional treatment
(No chemical etching, primer, bonding resin)

*Resin cement : Ivoclar - Variolink

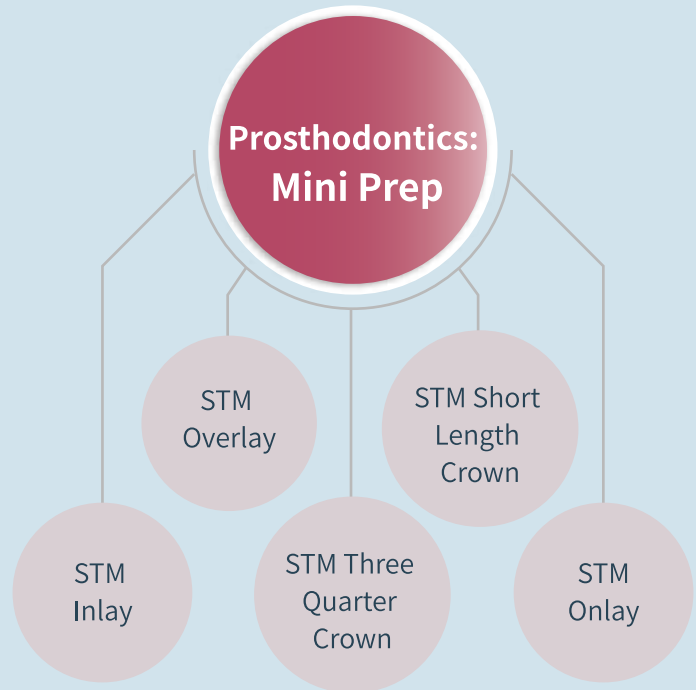
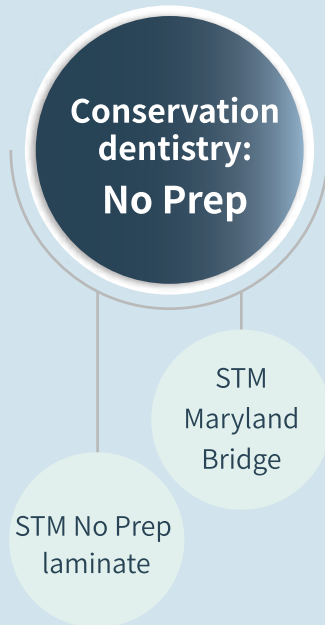
Treated with acid etching / silane / adhesive resin

Lithium Disilicate vs Zirconia

Average	31	43.6
Standard Deviation	6	4.5
Maximum Bonding Strength	40.1	53.2

Dental clinical application :

Expansion of Zirconia prosthetics indications



Pediatric Dentistry

Early treatment of cavities in permanent teeth, congenital tooth defects, enamel dysplasia, etc. Treatment can be completed without waiting until children reach adulthood.



Geriatric Dentistry

Minimal enamel removal and occlusal elevation possible in cases of generalized enamel wear



Surgery (Implants)

Increased bonding strength between abutment and zirconia prosthesis; prosthetics can be made at a height of 2.5mm or more.



STM Clinical Case

No Prep Laminate



Photos of prosthetics and plaster models

Mini Prep Laminate

BEFORE



AFTER



Maryland Bridge

BEFORE



AFTER



Prosthetics after sintering Zirconia



Inside view of prosthetic

Overlay Crown

BEFORE



AFTER PREP



AFTER



Photo of a plaster model after Prep





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