

# What's in your patient's mouth?



We use the most patient-friendly-zirconia material in the market  
100% Trackable System



See back page

**Certificate**  

Yttria Stabilized (YZ)  
Zirconia Restoration

Zirconia disc & restoration made in the U.S.A.

Manufactured by ISO standards and listed under FDA. Please scan the QR code above for detailed zirconia disc tracking information and the restoration information.

Material/Composition	Restoration Tracking Number
zirconium Oxide (ZrO2-HfO2)	> 90%
Yttrium Oxide (Y2O3)	< 8.6%
Aluminum Oxide (Al2O3)	< 1%

0000F-4240-05

Zirconia restoration tracking system and Warranty system are Patents Pending

Dentist Certificate

# 1 B&D Zirconia, The Kindest to Opposing Dentition

An adult molar with 4 distinct cusp tips was chosen for consistency in the density of a testing sample.

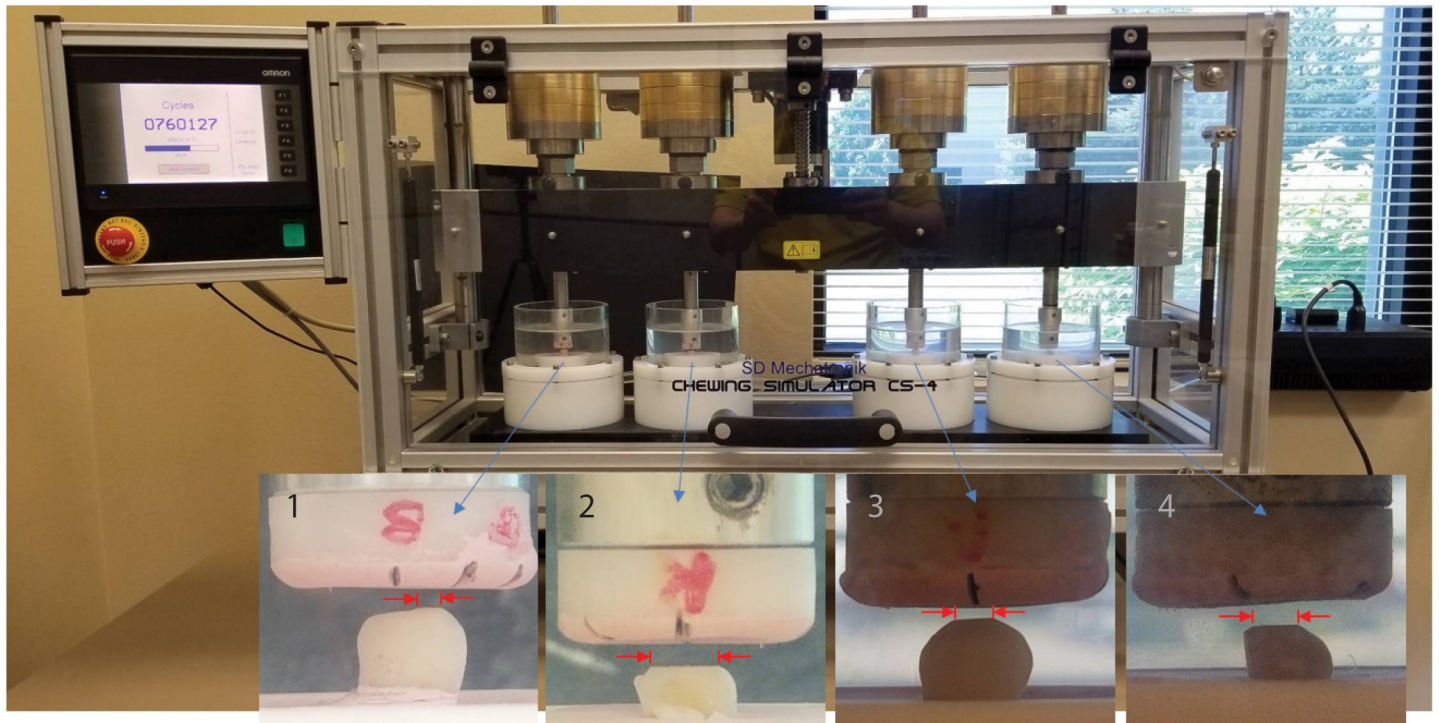
Then the tooth was sectioned into 4 equal parts.

Each different brand of zirconia sample was prepared according to Instructions for Use.

The sectioned tooth was fixed into a composite material in a jig to oppose each different brand of zirconia for comparative wear test.

## CHEWING SIMULATOR 1.25 Million Cycles Simulates 5 Years of Chewing

See the machine in action



1	2	3	4
B&D Dental ORIGIN BeyondPlus™ Multi (A2)	Katana Noritake STML, YML Multi (A2)	Argen HTLM Multi (A2)	Ivoclar e.max ZirCAD Prime (multi, A2)



# In Vitro Test Results (Multilayer, A2)

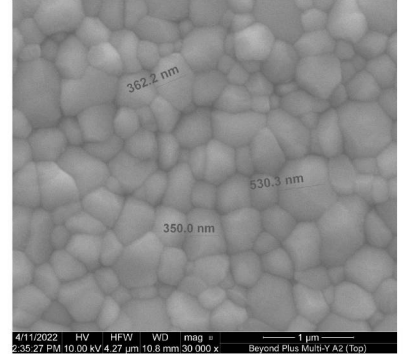
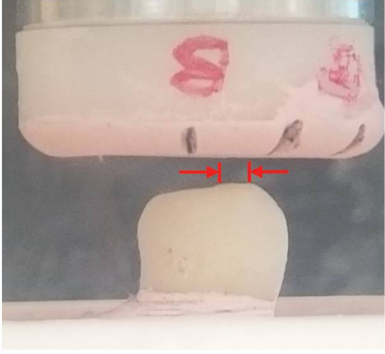
## (Natural Tooth Abrasion from Different Brands of Zirconia)

Zirconia Opposing Tooth

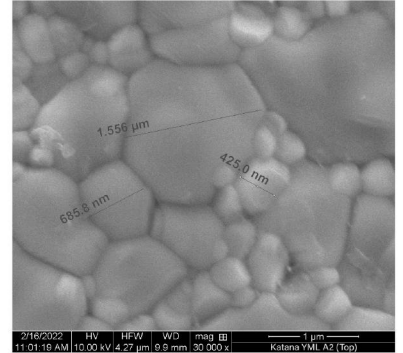
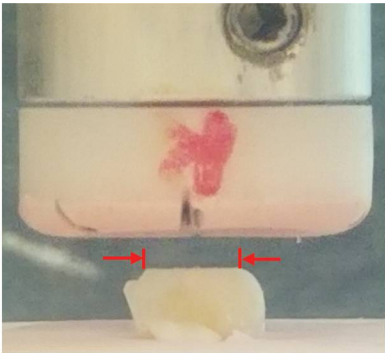
Perspective View

Severity of Wear

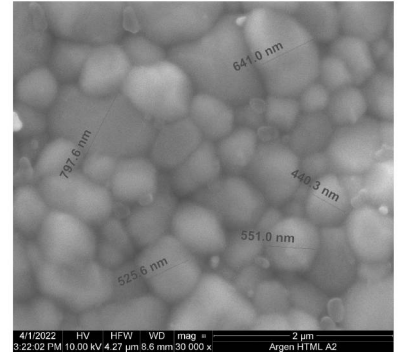
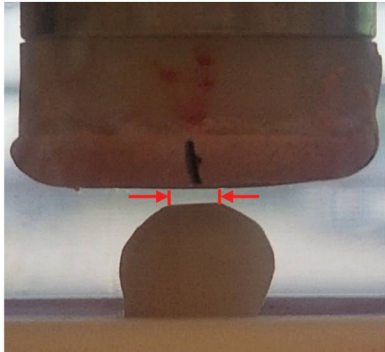
Particle Size



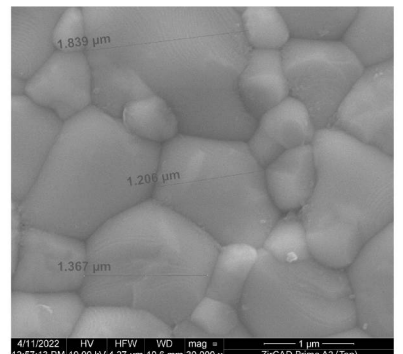
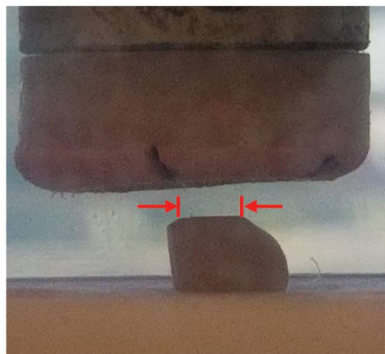
1. B&D Dental, ORIGIN Beyond Plus (Made in U.S.A.)



2. Katana Noritake, STML, YML Multi (A2)



3. Argen, HTML Multi (A2)



4. Ivoclar, e.max ZirCAD Prime (Multi, A2)

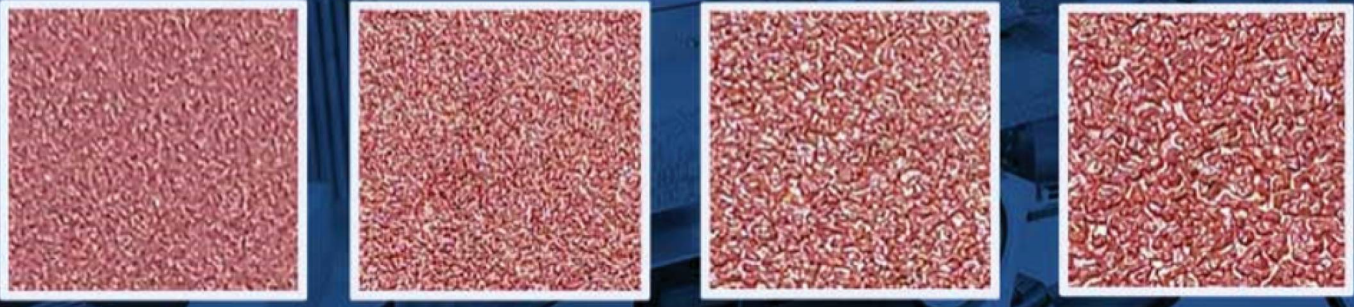
Independent Test

See the full Scientific Report

**SDM** SD Mechatronik  
MATERIAL TESTING



## Particle Size Matters



**240 Grit**      **120 Grit**      **80 Grit**      **40 Grit**

Do patients want a crown that acts as sandpaper in their mouth?

Thankfully, the nano particles utilized by B&D Dental Technologies more closely approaches the smoothness of a natural tooth surface, especially when polished.

In vivo test

## Consequences of Using Large Grain Zirconia

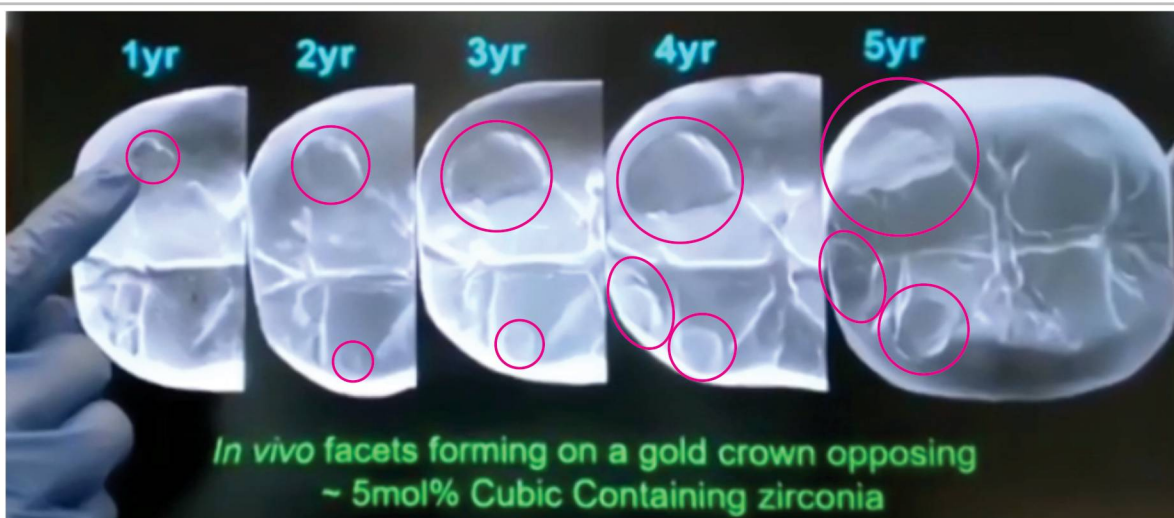


Photo Courtesy of TRAC (Clinicians Report, Dr. Rella Christensen)

Cubic zirconia has certain limitations. Those limitations can be overcome by :

- 1) Engineering the green body particle size to be **as small as possible**.
- 2) Avoid excessive use of yttria. **Nano-particle colloidal technology** substantially improves **fracture resistance**. (See the next page)



# 2

## ORIGIN Zirconia is The Industry Leader of Optimal Aesthetics/Translucency Performance

Guess which one is the crown?

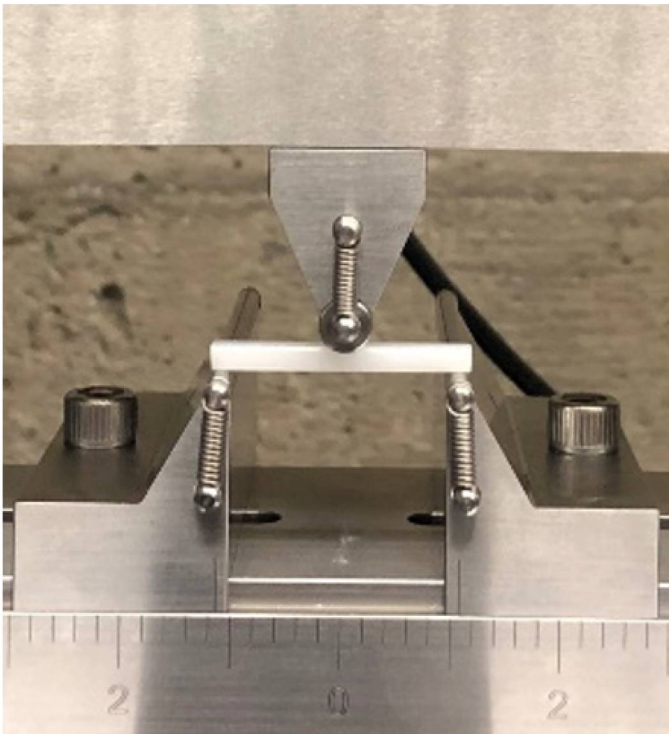


ORIGIN full contour crown in the patient's mouth, 10 months after seating. It is difficult to distinguish the crown from the natural teeth. (The answer is upper second bicuspids, #13)

- Others in the industry continue to chase aesthetics by adding more 5Y cubic zirconia to the incisal/occlusal area. Unfortunately, this comes at a cost to patients. Their sintered grain size is much larger and conspicuously more abrasive than our proprietary colloidal 4Y zirconia.
- Thanks to our unique process, B&D Dental preserves the health of the opposing teeth. We are able to optimize aesthetics and translucency without compromising strength.

# 3

## Superior Strength



- Flexural strength of a leading brand zirconia, produced by the conventional method of dry compaction, claimed a strength of 1,250 Mpa. Testing showed an actual average strength of only 972 Mpa.
- Beyond Plus zirconia produced by B&D's colloidal method exhibited much higher average strength (1,043 vs 972 Mpa).

This is due to the more homogeneous and reliable nanostructure of particles from B&D's colloidal method.

# 4

## Duarability

Sintered body analysis

Crack initiation

Poor crack inhibition mechanism

Excellent crack inhibition mechanism

Sintered body from Common Method Dry Compaction (Cold Isostatic Press, CIP) Multi Layer, A2

Sintered body from B&D Dental Colloidal Zirconia Beyond Plus Multi Layer, A2

When an external force initiates a crack, smaller grain sizes significantly contributes to resisting crack propagation due to the **large surface area created by smaller grains** between boundaries.

## High Performance - Smaller particle size determines the ultimate quality for patients: Duarability and preserving the opposing tooth integrity

In B&D's unique colloidal method, zirconia powders/granules are downsized to nano particles of 200-300 nano meters (200 X smaller than the competitors) overnight in a colloidal liquid using grinding medium. ORIGIN zirconia from B&D dental uses this unique process to create high performance features for sintered restorations.

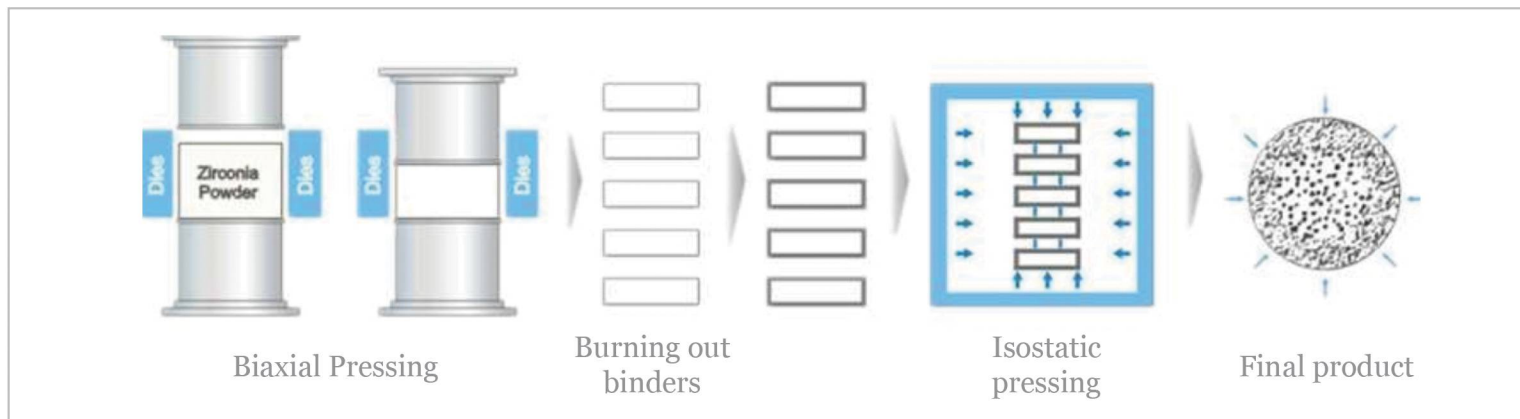


See how nano-particles are created in colloidal method

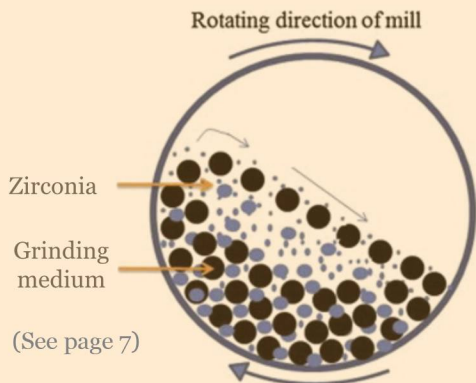


# ORIGIN Zirconia Uses Different Technology Than ALL Other Manufacturers

## Other Manufacturers



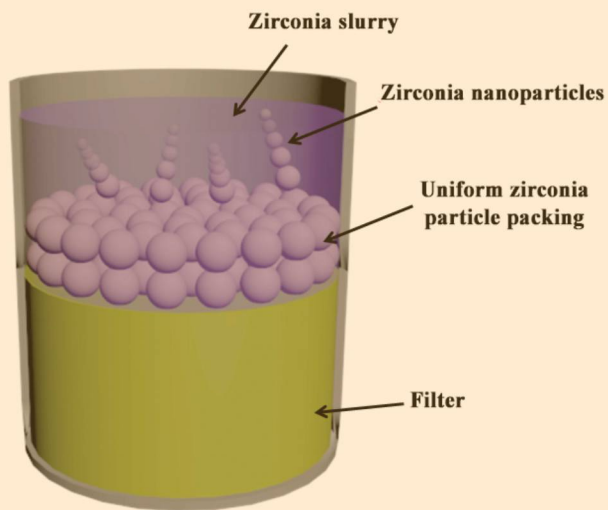
## B&D Dental (Colloidal Process)



Zirconia Particle Size Reduction



Zirconia Slurry Production



Disk Casting (Pressing)



Casting/Drying

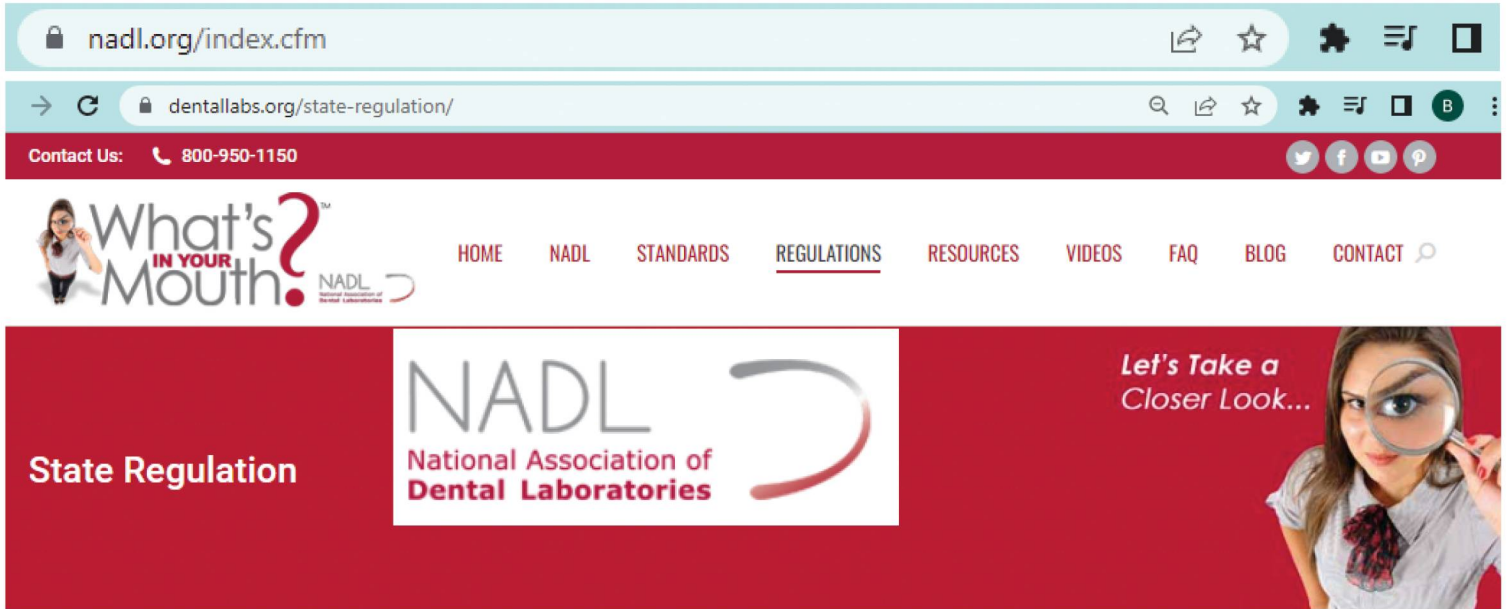
## Colloidal Process

This unique production process consistently results in **far better TRANSLUCENCY** at any given **STRENGTH** than the dry compaction method\*.

\* Due to much smaller particle sizes with far less voids

# What's In Your Mouth Campaign

sponsored by NADL (National Association of Dental Laboratories)



Source: www.NADL.org

## Current Environment of State Regulation

Primary requirements include:

- lab registration
- material and point of origin disclosure
- one CDT for each lab or required continuing education (CE)

## Important Questions to Ask

### ▲ What is the purpose of the What's In Your Mouth Campaign?

"What's in Your Mouth", by the National Association of Dental Laboratories aims to raise awareness regarding the important role and value of the dental laboratory and a trained and educated dental technician as part of the dental restorative team. Dentists and patients should know where their dental restorations are coming from, who is making them and what materials are used in the process.

Source: www.NADL.org and www.DentalLabs.org

# 13 States Registered Already



Visit the NADL website



# The Problem

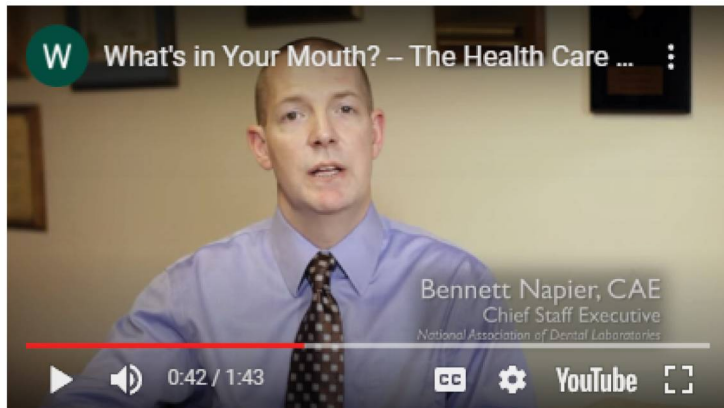
Currently there is no verifiable tracking system offered by material manufacturers regarding where the restoration is made and what material is used for the restoration



What's in Your Mouth – "The Issue"

Patients cannot access dental laboratory services directly, hindering the dissemination of critical information. Overseas laboratories do not abide by the same regulations as domestic laboratories. Poorly made dental restorations can lead to a host of health complications for patients. (Source: [www.dentallabs.org/video-gallery/](http://www.dentallabs.org/video-gallery/))

Watch this movie from NADL



What's in Your Mouth: The Health Care Team



Are you aware of what's in your mouth? The National Association of Dental Laboratories recommends that patients ask the questions presented above.



What's in Your Mouth: Campaign Video



Do you know what's in your mouth? The majority of dental restorations are made at dental laboratories outside of the dental office, and these laboratories must abide by regulations, but what about restorations made overseas? What materials were these restorations made with? Transparency is the key to helping you make informed decisions.

# The Solution:

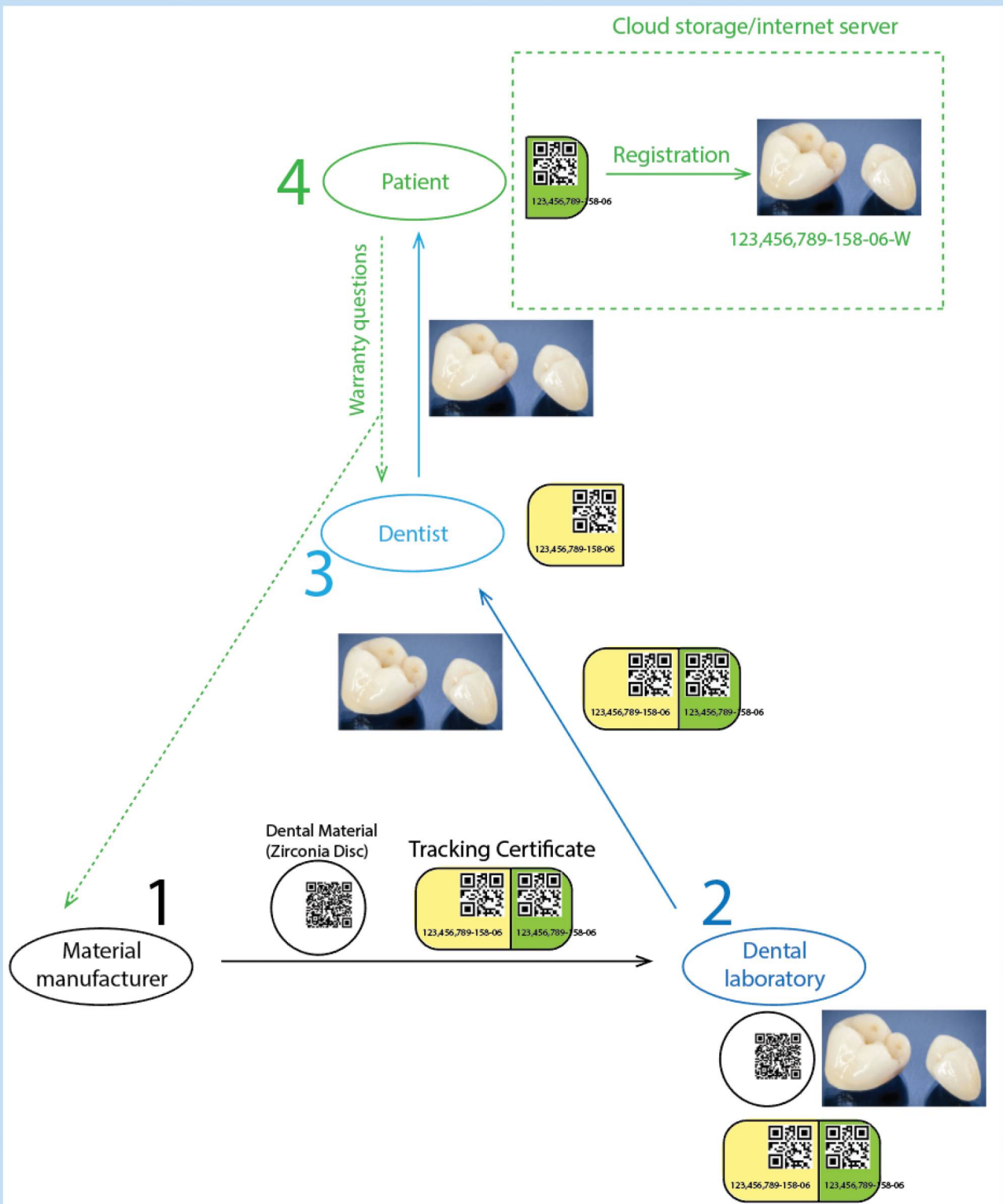
# OTS<sup>TM</sup> ORIGIN Tracking System\*

\* Patents Pending

We created a zirconia restoration tracking system that enables doctors and patients to track:

- where the zirconia material (disc) is manufactured
- what the material composition is (3Y, 4Y or cubic 5Y)
- how ORIGIN zirconia is outperforming other major brands by showing invitro tests results continuously

This will help in establishing trust among all parties.





# ORIGIN Value Proposition

ORIGIN value proposition has 3 main components:

- 1) Highest performing ORIGIN zirconia
- 2) ORIGIN Tracking System that provides transparency and ensures the dentist and patient trust
- 3) ORIGIN 10 year Warranty Program that gives peace of mind to patients

## 3) ORIGIN Warranty Program\*

\* Patents Pending

(See separate literature or visit [www.CrownCertificate.com](http://www.CrownCertificate.com))

**Certificate**  
Yttria Stabilized (YZ)  
Zirconia Restoration



Zirconia disc & restoration made in the U.S.A.

Manufactured by ISO standards and listed under FDA. Please scan the QR code above for detailed zirconia disc tracking information and the restoration information.

Material/Composition	Restoration Tracking Number
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Yttrium Oxide (Y <sub>2</sub> O <sub>3</sub> ) < 8.6%	
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ) < 1%	

Zirconia restoration tracking system and Warranty system are Patents Pending

Dentist Certificate

**Certificate of Warranty Benefits**



**Up to \$1,500**  
for the next 10 years

Registration Required

Crown ID Number:  
**000F-4240-01**

Patient Copy

ORIGIN Zirconia Restorations come with a tracking certificate:

- one part for dentist record
- the other part for patient record

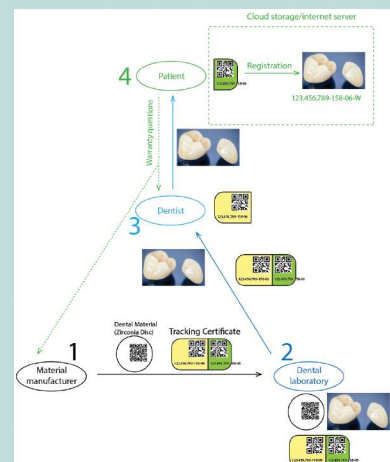
The restoration tracking number is used by the patient for Warranty registration.



Dentists & Patients

Manufacturer

Laboratory



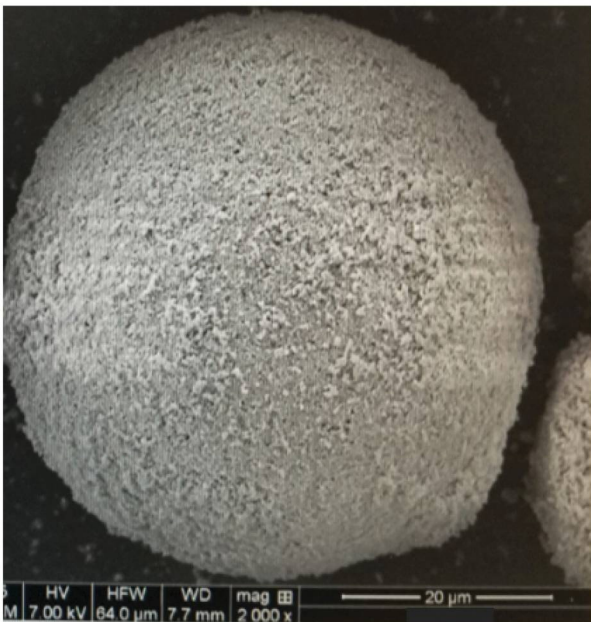
1) Highest performing ORIGIN zirconia  
(See pages 4-5)

2) OTS<sup>TM</sup> (ORIGIN Tracking System)



We are the only zirconia disc manufacturing company in the world that does not use chemical binders in the zirconia powder. As a result, there is no toxic air pollution during manufacturing.

Enlarged image of a single granule of powder particles



## Did you know?

This is a magnified image of one granule of zirconia powder as utilized by all other manufacturers (excluding B&D Dental). Each granule has hundreds of thousands of particles glued together by chemical binders\*. When these binders are burned out during manufacturing, a large amount of toxic gases are released into the atmosphere and a substantial volume of voids/pores remain, lowering the translucency of the material.



\* B&D's Slip casting (Colloidal) method doesn't require the use of binders in the zirconia powders.