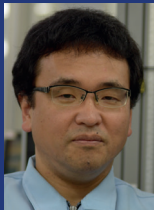


# KATANA™ Zirconia multi-layered discs. 10 YEARS ANNIVERSARY INTERVIEW



**WITH YOSHIHISA YAMADA**

*General Manager, Technology Division of  
Kuraray Noritake Dental Inc.*

**KATANA™ Zirconia ML was introduced ten years ago, at the IDS 2013 in Cologne, as the dental industry's first zirconia product with a multi-layered colour structure. Since that event, KATANA™ Zirconia ML blanks have become very popular. Continued development efforts have led to the current line-up of multi-layered materials, KATANA™ Zirconia UTML, STML and HTML PLUS, and our latest product – KATANA™ Zirconia YML. Our new technology with colour, translucency and strength gradation is found in KATANA™ Zirconia YML.**



Photo credits to MDT Giuliano Moustakis

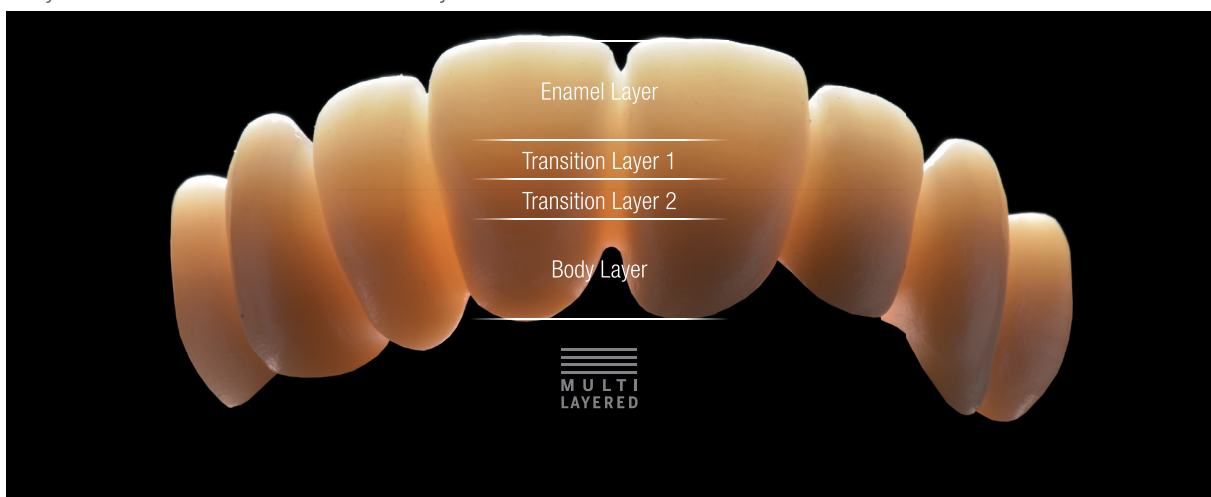
**How important was the invention of the Kuraray Noritake Dental's original multi-layered technology for the dental market?**

Our impression is that the material has had a significant impact on the dental market. Being the first zirconia material with a multi-layered colour structure, KATANA™ Zirconia ML was our first product of its class to offer the properties needed for the efficient production of full-contour zirconia restorations with a natural look. Before its introduction, the “full-contour zirconia” concept had not been widely accepted due to the aesthetic properties of the zirconia

materials available so far: Many of them lacked the desired level of translucency, while others needed to be treated with dyeing liquids or stains in a complex procedure to obtain a natural shade appearance. With the launch of multi-layered zirconia blanks, which successfully added natural colour gradation to the structure, aesthetic full-contour zirconia restorations started to become popular among dental technicians worldwide. The high potential of the technology was confirmed at the IDS 2013 show, when we saw not only end-users, but also engineers from competing companies come to look at this product.

4-layer colour structure of KATANA™ multi-layered discs

Photo credits to MDT Daniele Rondoni



**What changes were driven forward by the introduction of KATANA™ Zirconia ML?**

After the introduction of KATANA™ Zirconia ML, many companies started developing multi-layered zirconia discs, creating a new dental product category with an added technical and clinical value. We are convinced that the invention of Kuraray Noritake Dental has played a major role in the shift from zirconia exclusively used as a framework material to alternative approaches including full-contour zirconia restorations. If only monochromatic zirconia discs had been available, we imagine that an increased number of dental technicians would have embraced the concept of using liquid colourants to achieve a natural appearance of full-contour crowns and bridges. That would have prevented monolithic zirconia restorations from becoming as popular as they are today.

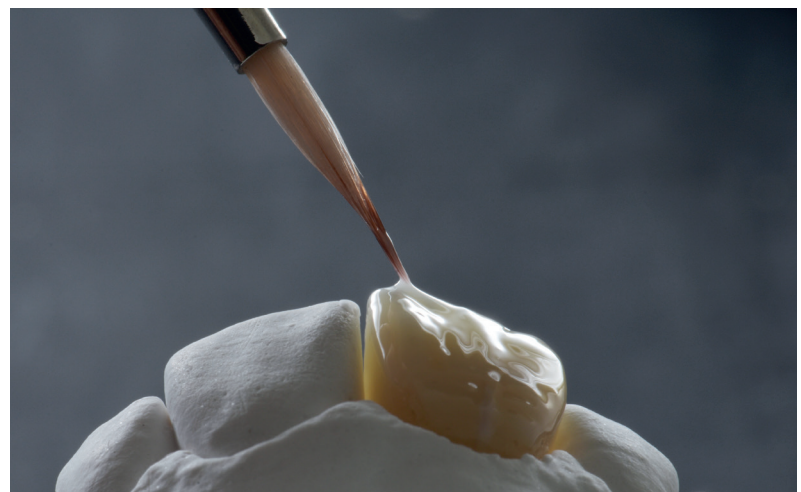
**How did the KATANA™ Zirconia ML technology evolve over the past ten years?**

Based on our unique core technology developed for inventing KATANA™ Zirconia ML, we have been continuing making efforts to create even better products. One of Kuraray Noritake Dental's great strengths is its ability to develop all the raw materials for its zirconia products in-house. This makes it possible for us to adjust the boundaries between the layers as inconspicuously as possible, even when discs consist of multiple layers. This enabled us to provide multi-layered discs with the required strength and aesthetic qualities, and with a stable, predictable shrinkage rate. In the past ten years, we have focused on adding new materials with different levels of translucency and strength to offer a portfolio that meets the demands of virtually every dental technician, practitioner and patient.

For example, the advent of KATANA™ Zirconia STML, which has even better aesthetic qualities than KATANA™ Zirconia ML, has made it possible to use it all by itself to create highly aesthetic restorations, with no need to characterize or individualize the restorations. Of course, if you use KATANA™ Zirconia Multi-Layered discs and treat the restorations with a surface staining agent, such as CERABIEN™ ZR FC Paste Stain, you can create even more aesthetic restorations in a shorter time.

**What are the benefits of Kuraray Noritake Dental's multi-layered technology, as compared with other manufacturer's solutions?**

KATANA™ Zirconia multi-layered discs offer the advantage of delivering the proper colour even when they are sintered at high speed. There are two reasons for this. First, we developed unique raw materials with suitable characteristics for high-speed firing. This allows the creation of restorations with the same strength, stability, and aesthetics to be achieved after both short- and long-time firing. The second reason is that we possess the technical know-how concerning excellent shading that Noritake Dental Supply, one of Kuraray Noritake Dental's predecessors, cultivated during its many years spent developing ceramic materials. Noritake Co., Ltd., parent company of Noritake Dental Supply, is a long-established ceramic manufacturer that is famous for its tableware and other outstanding products. It is this background that allows us to properly control pigment coloration using our inorganic pigment know-how and to provide unique firing schedules. These two strengths enable us to bring unique advantages to our products. That is, they remain stable and retain appropriate colouration even under rapid firing schedules.



CERABIEN™ ZR FC Paste Stain being applied to KATANA™ Zirconia restoration.

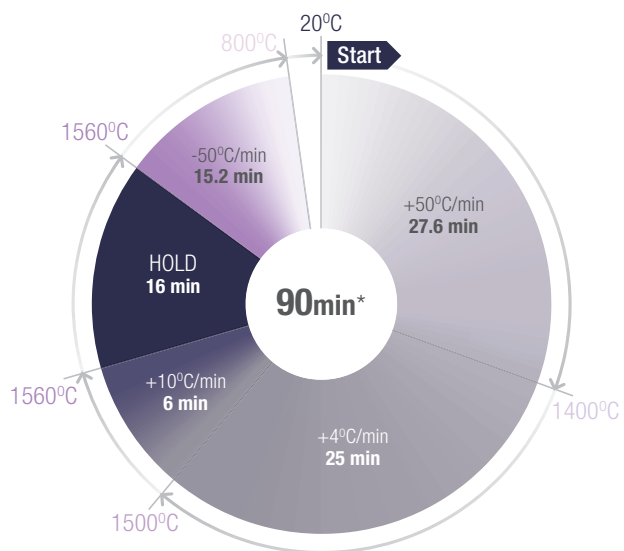
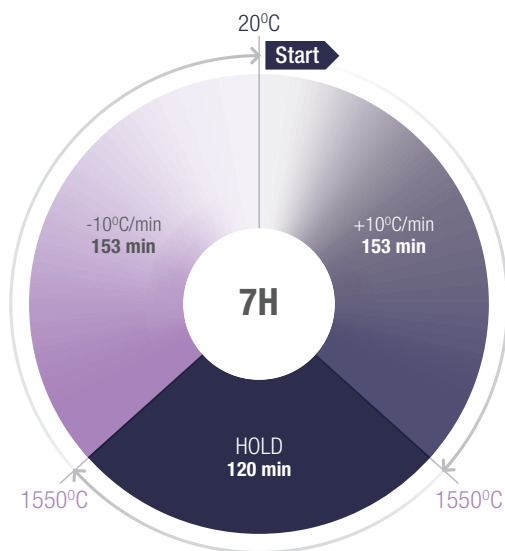
Photo credits to MDT Roberto Rossi

**How did you manage to shorten the sintering times so significantly, resulting in your speedy sintering with uniform protocols?**

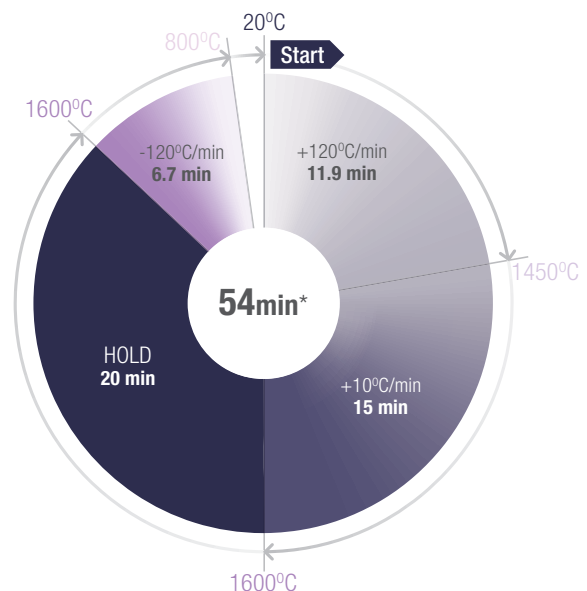
When shorter sintering times became possible, Kuraray Noritake Dental recommended that KATANA™ Zirconia ML be sintered for seven hours. After that, when a new furnace claiming being capable of short-time firing was launched, we used it to fire KATANA™ Zirconia ML on a trial basis. We found, happily, that our zirconia material was uniquely compatible with rapid firing. This was the beginning of our full-fledged study of short-time firing of our zirconia material. You could say that we began investigating short-time firing almost by accident. Then, while developing KATANA™ Zirconia STML and KATANA™ Zirconia UTML, successors of KATANA™ Zirconia ML, we focused on incorporating short-time firing into their features and made various adjustments, finally achieving the optimal combination of factors for the successful short-time firing of zirconia.

**What are the benefits of Kuraray Noritake Dental's second-generation multi-layered technology, as compared with other manufacturer's solutions?**

One advantage of KATANA™ Zirconia YML is that it can be applied to treat a wider range of cases without complex limitations on position within the disc. The reason: it delivers this high level of aesthetics while still maintaining great strength. This advantage of being appropriate for a wider range of cases also simplifies inventory management. In addition, users benefit from our expertise in developing raw materials and reproducing colour with ceramics. This expertise enabled us to develop a zirconia product in which each layer has a different level of translucency, while great strength and admirable aesthetics are maintained throughout the whole blank.



*The sintering recommendation is only a guideline; some adjustments may be required depending on each individual furnace. If the furnace cannot be set according to the 54- or 90-minute sintering schedule, speed sintering cannot be used.*



\* The restorations may be removed at 800°C or less depending on the circumstances.  
 \*\* For the sintering schedule of KATANA™ Zirconia HT, please refer to the Handy Chart in product packaging.

**Is it really possible to address every case using only KATANA™ Zirconia YML?**

For every case that can be treated either with KATANA™ Zirconia STML, KATANA™ Zirconia UTML, or KATANA™ Zirconia HTML PLUS, KATANA™ Zirconia YML is also an option. Hence, it is possible to use only KATANA™ Zirconia YML for all your zirconia cases – which is probably one of the reasons for its great popularity. It features both great strength and excellent aesthetics, and – being so versatile – it helps simplify inventory management. Of course, Kuraray Noritake Dental's other multi-layered materials feature outstanding properties as well. Depending on the features you need, it would also be an option to select from these products - KATANA™ Zirconia STML, KATANA™ Zirconia UTML, or KATANA™ Zirconia HTML PLUS – to realize your ideal restorations.

**Why is the KATANA™ brand in general so popular among dental technicians around the world?**

We think that dental technicians choose KATANA™ because they find that they can create highly aesthetic restorations using simple, straightforward steps.

**Is there any further development potential in multi-layered technology?**

On the basis of our technical know-how, there is always room for improvement. That is why we never stop innovating and listening to the voice of our customers. Developing what supports them in improving their outcomes while providing for more predictable, less stressful procedures is our ultimate goal. Right now, we expect to develop products with even greater strength, increased translucency, and outstanding aesthetics that will have a natural look resembling real teeth, even when the material used is full-contour zirconia.



KATANA™ Zirconia YML, finished with CERABIEN™ ZR.

Photo credits to MDT Giuliano Moustakis



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