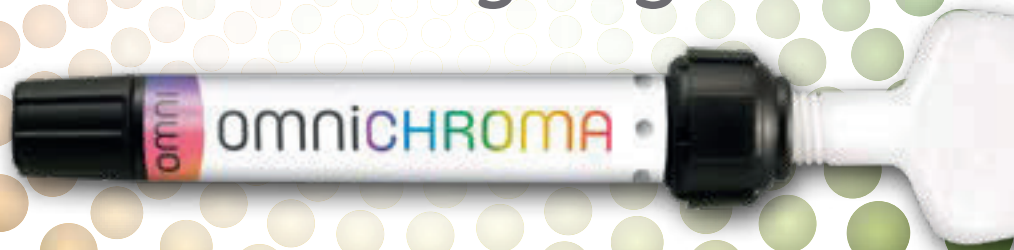


1000 Shades of White

... all in 1 Syringe!



WORLD
INNOVATION

omniCHROMA

The Future of Composites: Colour through Light

From the Technology Pioneer.

 **Tokuyama Dental**
Dental High Tech from Japan

Unique worldwide: Only a single composite for the entire range of tooth shades

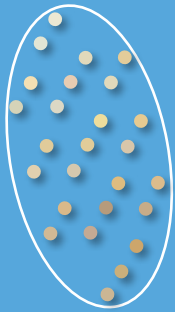
With OMNICHROMA, TOKUYAMA DENTAL has achieved a decisive innovation leap in composites. For the first time, the long sought-after chameleon effect has been achieved successfully culminating in natural perfection. The reason is as simple as it is spectacular: both the OMNICHROMA and the chameleon are coloured by light.

In conventional composites, a limited number of tooth shades, for example, from A1 to D4 according to the VITA shade system, are reproduced using colour pigments. Due to the "*Smart Chromatic Technology*", OMNICHROMA completely dispenses with colour pigments and instead uses the natural principle of structural colour – colour that becomes visible when light strikes special structures, the same as with chameleons.

- In 2015, scientists at the University of Geneva discovered that the chameleon has a network of nanocrystals in its skin that selectively reflects certain wavelengths of light.
- OMNICHROMA consists of a homogeneous "pearl structure", which makes the reflection of a precisely defined light wave range possible.
- The targeted refraction of light creates structural colour in the yellow-red range and also reflects the surrounding real tooth colour.
- This was achieved by further developing TOKUYAMA DENTAL's patented "*Sub-Micro-Pearl-Technology*" with spherical fillers obtained according to the "cultured pearl principle".

Spectrum of indications

- Direct anterior and posterior restorations
- Directly bonded composite veneers
- Diastema closure
- Repair of ceramic/composite

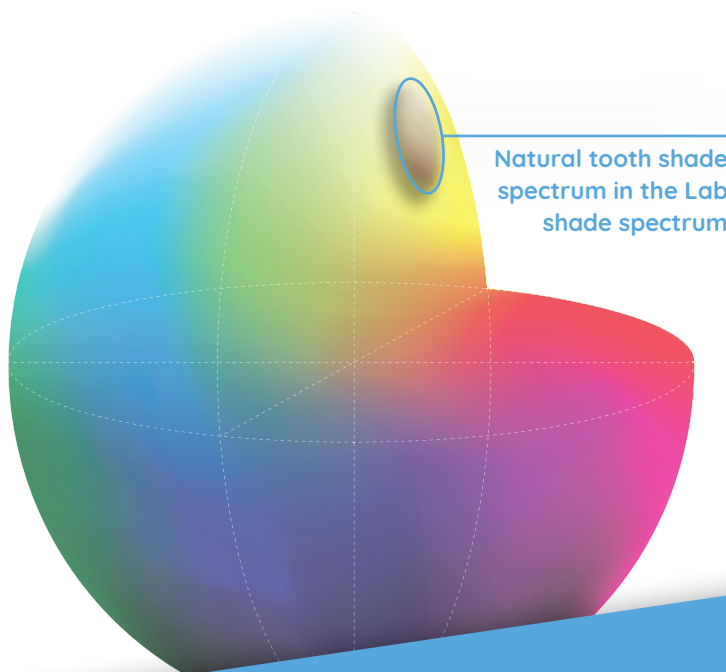


Conventional composites

UP TO 36
DIFFERENT
TOOTH SHADES
WITHIN THE
TOOTH SHADE
RANGE

OMNICHROMA composite

CONTINUOUS
REFLECTION
ACROSS ALL
SHADES OF THE
ENTIRE TOOTH
SHADE SPECTRUM



Natural tooth shade
spectrum in the Lab
shade spectrum



Numerous advantages:

OMNICHROMA composite

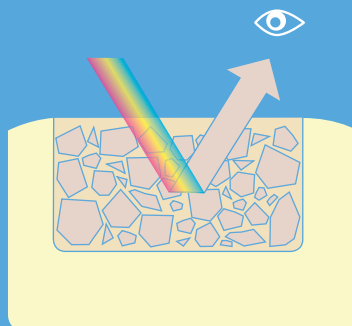
- Eliminates the need for shade determination
- Simplifies stocking
- Eliminates the need for special colours
- Reduction in expiring material
- Permanent availability of the right shade

Uniquely esthetic: Outstanding colour adaptation

Smart Chromatic Technology: precisely 0.00026 millimeter sized beads and the translucency of the cured composite ensure that the right tooth shade is always created from light.

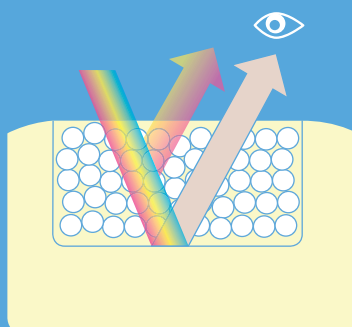
Conventional composites

THE COLOUR PIGMENTS
OF THE COMPOSITE
(FOR EXAMPLE, A3)
ARE REFLECTED.



OMNICHROMA composite

THE REAL TOOTH SHADE
OF THE CAVITY WALLS
OR CAVITY BASE IS
REFLECTED AS IS
THE RED-YELLOW
STRUCTURAL SHADE
OF THE HOMOGENEOUS
PEARL STRUCTURE.



The innovation breakthrough from TOKUYAMA's Research

The phenomenon of colour adaptation in chameleons is the same as with OMNICHROMA: the light strikes a very specific structure in the sub-micro or nanometer range.

The decisive question was: which structure, in other words, which size and shape do the fillers need to have for the light to reflect real tooth shades optimally?

In 2018, TOKUYAMA Research found the answer: the "*Smart Chromatic Technology*".

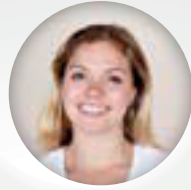
When light strikes small spherical fillers at exactly $0.26\ \mu\text{m}$ the refraction and diffraction of the light generates the ideal red-yellow colour effect that is necessary to faithfully imitate the genuine tooth shade.

In contrast to conventional composites, OMNICHROMA is intended to achieve an extreme colour change after curing and is also very practical when modeling.

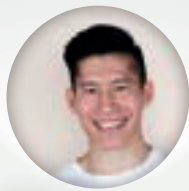


Typical for OMNICHROMA:
Opaque beforehand ...
beautifully semi-translucent
afterwards





Johanna's white



Leo's white



Betty's white

SM CHRO TECHN

As many
white a
are p



The key technology for OMNICHROMA comes from the TOKUYAMA Research Center in Japan.



Tsukuba

The TOKUYAMA DENTAL Corporation, based in Japan, has been developing

innovative dental solutions for over 40 years and is one of the leading manufacturers of products for conservative and prosthetic dentistry.

ART MATIC OLOGY

shades of
s there
eople.



Sophie's white

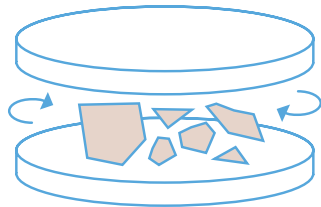


Anna's white

The secret is our method of manufacture

Conventional process

PRODUCTION OF FILLERS WITH A GRINDING PROCESS



Glass materials are ground until the individual particles of the fillers lie approximately within a desired size range. However, the fillers clearly differ in shape and size.



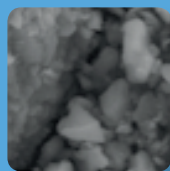
SEM image
(1 μm ; 20,000x magnification)
Harmonize, Kerr



SEM image
(1 μm ; 20,000x magnification)
Tetric EvoCeram,
Ivoclar Vivadent



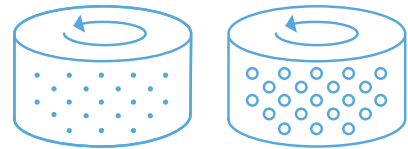
SEM image
(1 μm ; 20,000x magnification)
Filtek Supreme XTE,
3M Espe



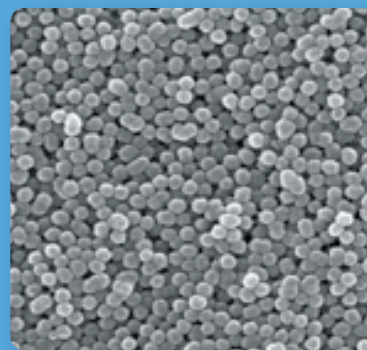
SEM image
(1 μm ; 20,000x magnification)
Ceram X, Dentsply

Sub-Micro-Pearl-Technology

"GROWING" FILLERS WITH THE SOL-GEL METHOD



TOKUYAMA DENTAL produces OMNICHROMA fillers based on its own patented "*Sub-Micro-Pearl-Technology*". In this process, the Sol-Gel method is used to progressively coat spherical fillers in an organic solution. After several weeks, the fillers have "grown" evenly in a spherical shape and are exactly 0.26 μm in size. In this optimal size, the desired colour adaptation effect is achieved precisely in combination with other outstanding physical properties.



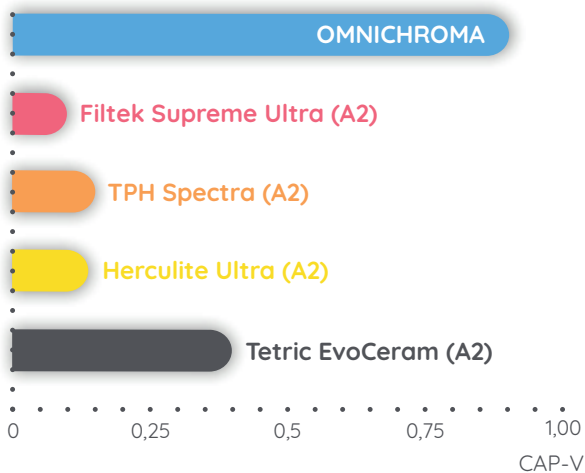
SEM IMAGE (1 μm)
OMNICHROMA, TOKUYAMA DENTAL

Clinical studies confirm the excellent colour adaptation properties of OMNICHROMA (CAP-V)

The University of Texas study analysed the Visual Colour Adjustment Potential (CAP-V) of various composite materials through visual evaluation.

Of the five composites tested, OMNICHROMA from TOKUYAMA DENTAL demonstrated the best shade adaptation effect.

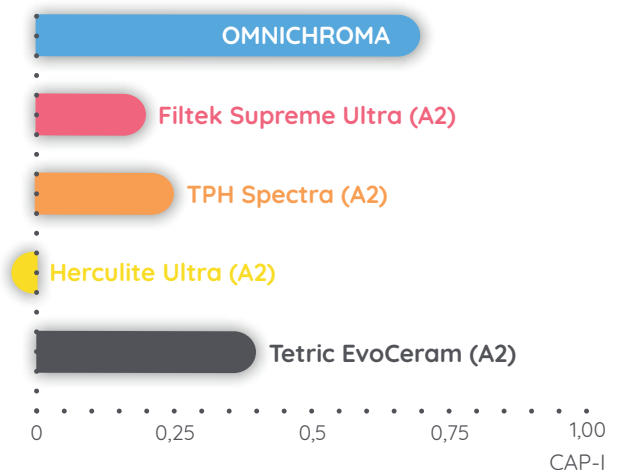
The evaluation of shade differences in Class I restorations compared to the surrounding artificial tooth substance was lowest for OMNICHROMA, which represented the best correlation between OMNICHROMA and the A1-D4 prosthetic teeth.



Clinical studies confirm the excellent colour adaptation properties of OMNICHROMA (CAP-I)

Another study by the University of Texas also analysed the Instrumental Colour Adjustment Potential (CAP-I) of various composite materials by instrumental evaluation.

OMNICHROMA again confirmed the results of the previous study (CAP-V) in the instrumental determination of the colour adaptation effect. Both visually and instrumentally, OMNICHROMA thus offers a very broad chameleon effect across the entire VITA shade palette.



omniCHROMA:

International study results

Effect of filler size on the colour adaptation effect

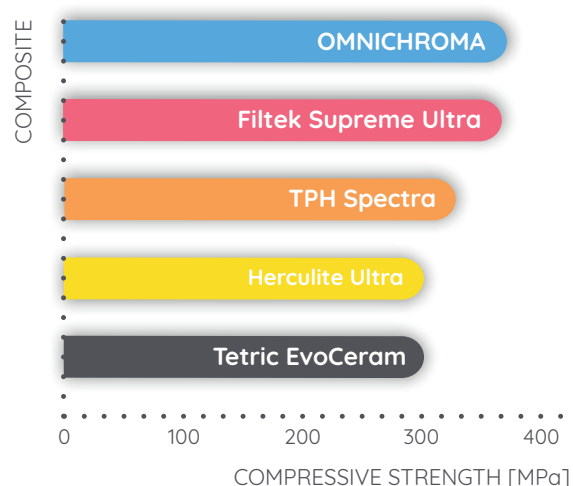
To demonstrate that the size of the fillers significantly relates to the structural shade produced, Tokyo Medical and Dental University examined three composites with fillers of different sizes for their respective shade adaptation effects. Cavities on eleven different human teeth (shades A2, A3, A4, B2, B3, B4, C2, C3, C4, D2, and D4) were filled with OMNICHROMA (260 nm), an experimental nano-composite (100 nm) and a conventional composite with ground fillers. The respective colour adaptation was then measured using a spectrophotometer and compared with the measured colour before filling (Delta E_{00}).


	ECM	R1	R2
FROM INCISAL	1.40±0.37 ^A	2.09±.73 ^B	2.02±0.68 ^B
FROM CERVICAL	1.45±0.30 ^a	2.07±0.23 ^b	2.05±0.21 ^b

The samples demonstrated significant differences with respect to Delta E_{00} ($p < 0.05$), depending on the material differences. OMNICHROMA exhibited significantly lower Delta E_{00} -values than R1 (ground fillers) and R2 (nano fillers) from both viewed from incisal and cervical, suggesting that OMNICHROMA has a superior ability to mimic the original shade of the human tooth. This also indicates that the particle size of the filler has a significant influence on OMNICHROMA's colour adaptation capability.

Not only superior in colour adaptation, but also superior under load

The Oregon Health & Science University investigated numerous material properties of OMNICHROMA in comparison to conventional composite materials. Here, too, OMNICHROMA's superior class was demonstrated, as the special filler structure and filler composition result in an outstanding load-bearing capacity of the material. Among other things, this is reflected by excellent compressive strength.





Not only superior in colour adaptation, but also superior colour retention

At Okayama University, a series of tests investigated the colour stability of OMNICHROMA. Four artificial teeth in the shades A1, A2, A3 and A3.5 were filled accordingly and stored in a water bath. The colour adaptation of OMNICHROMA was measured immediately after one day, after one week and after three months. The result was as follows: "The study demonstrated that OMNICHROMA can cover a wide range of cavity colours with just a single shade. This study also demonstrated that the composite material based on the structural shade system has the potential to enable esthetic restorations without shade selection or layering."

A further in-house study (TOKUYAMA R&D) also showed that OMNICHROMA still adapts to the changed real tooth colour even after bleaching.



The surface is decisive

Which is easier to polish?
Which reflects light more uniformly?
Which shines more beautifully?

Brilliant results

With its mirror-smooth surfaces, TOKUYAMA's Sub-Micro-Pearl-Technology provides a fast and long-lasting gloss.

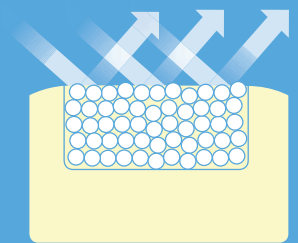
In the case of typical ground fillers, the light strikes extremely irregular surfaces that scatter the light diffusely and appear correspondingly matt or require a long and complex polish.

The law of reflection "angle of incidence equals angle of reflection" is the basic prerequisite for the gloss effect and only works with very smooth surfaces: with mirrors, natural teeth and OMNICHROMA.



CONVENTIONAL NANO-HYBRID FILLERS

ROUGH, IRREGULAR SURFACES REFLECT LIGHT MORE DIFFUSELY: LESS GLOSS

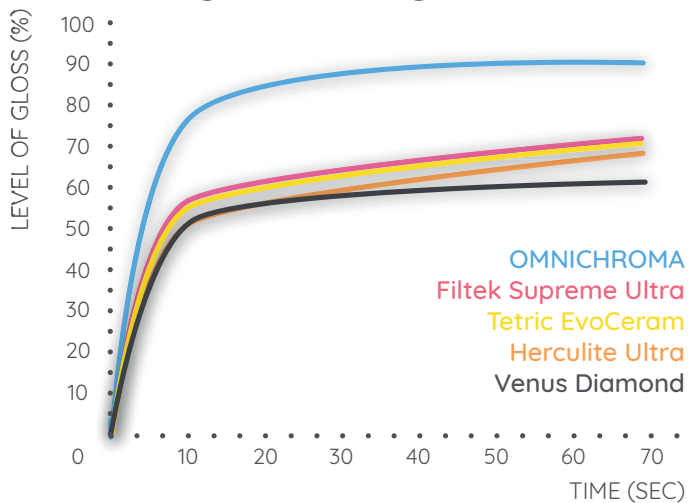


OMNICHROMA WITH SUB-MICRO-PEARL-TECHNOLOGY

UNIFORM REFLECTION OF LIGHT AS WITH A MIRROR: NATURAL HIGH GLOSS

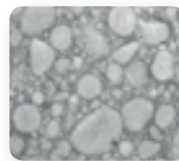
Superior polishability:

89 % gloss already after 30 sec.

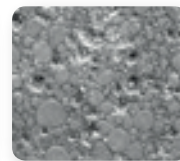


Excellent abrasion properties

OMNICHROMA is a particularly abrasion-resistant composite, yet at the same time gentle on the antagonist due to its unique filler structure, which only offers a small surface area for abrasion.



(5 μm)



(10 μm)

FILTEK SUPREME XTE
before and after the
abrasion test



(5 μm)



(10 μm)

OMNICHROMA
before and after the
abrasion test

OMNICHROMA: A composite with unique properties

UNIQUELY USER-FRIENDLY



- No sticking to instruments due to perfectly round fillers with smooth surfaces
- Good processing time
- White opaque colour shade is easy to process visibly
- Excellent adaptation to the cavity walls due to soft creamy consistency

UNIQUELY PATIENT- FRIENDLY



- Free of Bis-GMA – for a significant reduction in the risk of allergies
- High resistance: due to good flexural strength and very high compressive strength

UNIQUELY TIME- SAVING



- Due to the perfect chameleon effect, time-consuming shade determinations are a thing of the past
- Always reorder, store and document only 1 product at a time
- Highest level of polishability: mirror shine in a flash due to spherical fillers

UNIQUELY ESTHETIC



- Creation of a structural shade through precise light refraction of the homogeneous pearl structure as well as reflection of the surrounding tooth shade: for a perfect chameleon effect, even for bleached teeth
- Perfect gloss due to optimal light reflection
- Permanent colour fidelity
- Highly resistant to discolouration



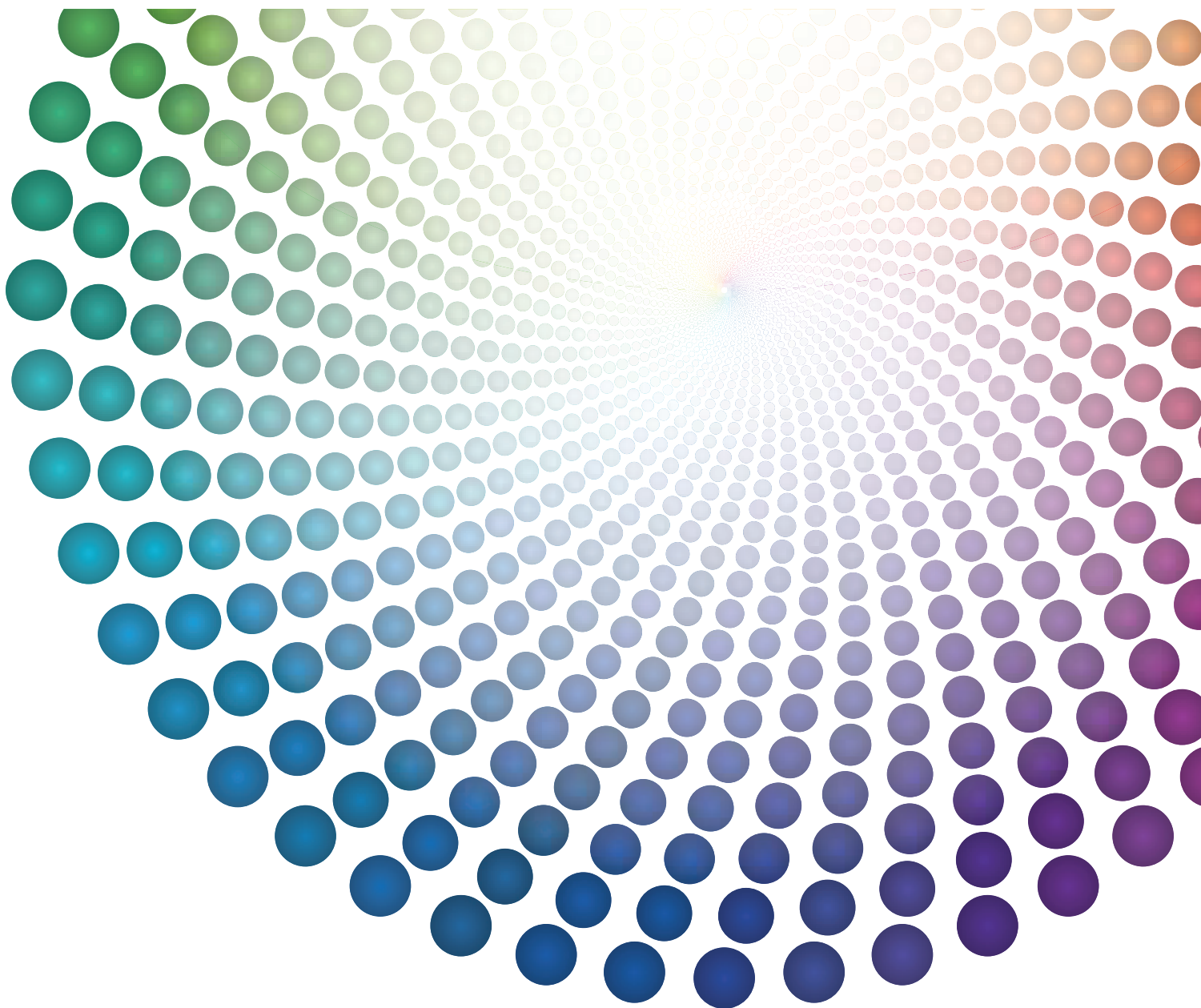
10112 | OMNICHROMA composite
Single syringe (à 4 g)

10122 | OMNICHROMA composite
20 dose capsules (à 0.2 g)

10113 | OMNICHROMA blocker
Single syringe (à 4 g)

10123 | OMNICHROMA blocker
20 dose capsules (à 0.2 g)





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From the Technology Pioneer.

 **Tokuyama Dental**
Dental High Tech from Japan