

Teardown: How Beijing Weijiahua Uses Multilayer Gradient Zirconia & 1450°C Sintering to Push Dental Restoration Limits

A technical breakdown of multilayer gradient zirconia, 1450°C sintering, and dental restoration workflows.

CALIFORNIA, CA, UNITED STATES, October 10, 2026 /EINPresswire.com/ -- Beijing-based YIPANG publishes a multilayer gradient dental zirconia block portfolio spanning 680–1,350 MPa flexural strength and 41–57% translucency, consolidated by cold isostatic pressing and sintered in a 1,430–1,450°C window.

Beijing — Beijing Weijiahua Dentistry Equipment Co., Ltd., the Chinese dental materials manufacturer that sells under the YIPANG brand, has set out the technical basis of a multilayer gradient zirconia block line

whose published specifications span the two properties dental laboratories have historically been unable to maximize in a single material: flexural strength and light transmission.

The company's published data lists a dental zirconia block portfolio covering five grades, with flexural strength from 680 MPa to 1,350 MPa and translucency from 41% to 57%. The recommended sintering temperature is 1,450°C, inside a stated processing window of 1,430°C to 1,450°C. Discs are supplied at a standard 98 mm diameter in six thicknesses: 10 mm, 12 mm, 14 mm, 16 mm, 18 mm and 20 mm. The company's verified product record lists the 4D-PRO-ML zirconia block for dental prostheses with ML multilayer shading, a sintering temperature of 1,450°C, bending strength of at least 1,200 MPa and a medium-translucent rating.



Logo for YIPANG

Industry Context: Zirconia's Installed Base Keeps Expanding

Zirconia has consolidated its position as the default framework material in fixed prosthodontics. Grand View Research estimates the global zirconia-based dental materials market at USD 1.2 billion in 2025, projected to reach USD 2.3 billion by 2033. Within that market, zirconia discs accounted for 63.1% of revenue in 2025, and the 3Y-TZP grade held the largest single product share at 35.9%.

The same research house estimates that CAD/CAM milling accounted for 82.4% of zirconia dental manufacturing process revenue in 2025, and that dental laboratories remained the dominant end user at 45.3% of market share. Regional revenue is concentrated: the United States accounted for 40% of the global zirconia-based dental materials market in 2025.

That structure places the burden of final performance on two production steps – milling and sintering – rather than on the block alone. It also explains why material suppliers now compete on process reproducibility as much as on a single headline strength figure.

The Trade-Off at the Core of Zirconia

Dental zirconia is not one material but a family of yttria-stabilised tetragonal zirconia polycrystals (Y-TZP) whose mechanical and optical behaviour is governed by yttrium oxide content. In 3Y-TZP, with 3 mol% yttria, a predominantly tetragonal grain structure delivers flexural strength of roughly 1,200 MPa, while grain-boundary scattering limits translucency to roughly 40%. In 5Y-TZP, a higher cubic-phase fraction reduces scattering and lifts translucency to roughly 50%, but strength falls to roughly 700 MPa.

The two properties therefore move in opposite directions along the same compositional axis. Producing a single restoration that satisfies an anterior region's optical requirements and a posterior region's load-bearing requirements has been the central engineering problem in zirconia block development.

Material System: 3Y, 4Y and 5Y Stabilisation

YIPANG's zirconia block range addresses that spectrum at several points rather than at one. The ST high-strength grade is specified at greater than 1,200 MPa flexural strength and greater than 43% translucency, positioned for posterior crowns, bridges and implant superstructures where load-bearing performance takes priority. The HT grade is specified at greater than 1,350 MPa and greater than 41% translucency.

Two intermediate grades target aesthetics-led work. The SHT-ML grade is specified at greater

than 1,000 MPa and greater than 46% translucency, positioned for restorations that require both optical depth and structural margin. The SHT-C grade is specified at greater than 900 MPa and greater than 45% translucency, aimed at anterior regions where higher light transmission is the primary requirement.

For a dental laboratory, the practical consequence is process continuity. A single material platform covering multiple grades keeps shrinkage behaviour and sintering parameters consistent across a production floor, reducing the recalibration that follows a change of supplied material.

Multilayer Gradient Architecture

The 5D-Aesthetics line is where the company's material engineering is most visible. The blocks are built from six stacked layers of pre-shaded zirconia powder rather than a single homogeneous composition. The published result is a continuous gradient of 680–1,200 MPa flexural strength and 43–57% translucency from the cervical region to the incisal edge.

Higher-yttria formulations at the incisal end raise light transmission to approximate the optical behaviour of enamel; lower-yttria formulations at the cervical end supply the mechanical support associated with dentine. The gradient is created during powder layering and consolidated by cold isostatic pressing, which the company states produces a seamless transition between layers rather than a visible internal interface.

The clinical implication is a shift away from the conventional workflow. A monochrome 3Y block typically requires post-sinter external staining or a veneering porcelain layer to reproduce the natural cervical-to-incisal transition. Full-contour milling of a pre-graded multilayer block removes the veneering step, which reduces both the chipping risk associated with layered porcelain and the technician hours attached to it.

Forming and Sintering: Cold Isostatic Pressing and the 1,450°C Window

Mechanical performance in a sintered zirconia restoration depends on green-body density as much as on powder chemistry. YIPANG blocks are formed by cold isostatic pressing (CIP), in which zirconia powder is sealed in a flexible mould and subjected to isotropic hydraulic pressure. Because the pressure acts equally in all directions, the resulting blank avoids the density gradients associated with uniaxial pressing, which in turn governs how uniformly the blank contracts during sintering.

Sintering is specified at a recommended 1,450°C, with a stated processing window of 1,430°C to 1,450°C and a fired density above 6.0 g/cm³. The company's

published processing guidance for the 4D-PRO-ML block states the same range: a heating curve up to 1,430–1,450°C with a defined holding time, followed by natural cooling, with rapid temperature change identified as a cracking risk and the maximum sintering temperature not to be exceeded.

The narrowness of that window is deliberate. Below 1,430°C, densification is incomplete and residual porosity reduces strength. Above 1,450°C, abnormal grain growth can occur; translucency may improve slightly, but strength falls as grains coarsen. Holding the processing range to roughly 20 degrees reflects an attempt to control grain size, densification and optical performance together rather than optimising any one of them.

Sintering is the step where process discipline most directly determines outcome. A 1,430–1,450°C specification is only meaningful if the laboratory’s sintering furnace delivers verified temperature uniformity across the chamber.

Compliance and Traceability

Beijing Weijiahua holds ISO 13485:2016 certification under certificate 381240434R0S, issued by Shanghai POSI Certification Co., Ltd. on 27 December 2024 and valid until 26 December 2027. The certified scope covers the design, production and sales of dental medical materials and dental equipment, against the GB/T 42061-2022 / ISO 13485:2016 standard.

For the European market, the company has issued a Declaration of Conformity under Regulation (EU) 2017/745 (MDR), recorded under Single Registration Number CN-MF-000045919 and dated 1 April 2026. The declared device scope covers the company’s intraoral scanner models YP-X and YP-800 as Class I medical devices, and the 4D-PRO-ML zirconia block is referenced as a related product in the same declaration record. The European Commission notes that MDR 2017/745 classifies most dental implants and restorative materials as high-risk devices requiring intensive clinical data, a classification that raises the documentation burden for materials entering the EU market.

Quality control at the company’s production facility is described as 100% raw material inspection combined with random finished-product inspection. Under an ISO 13485 quality system, powder batch records, pressing parameters, pre-sintering curves and final density and strength sampling data are maintained as a traceable record chain – the mechanism by which shrinkage behaviour can be kept consistent from one production batch to the next.

Adoption and Market Impact

According to the company’s case documentation, the blocks are used by hundreds of long-term cooperative clients worldwide, including dental laboratories, dental clinics and

distributors, in the manufacture of crowns, bridges and aesthetic restorations. The company describes those relationships as spanning multiple years and reports high recognition for material stability and aesthetic effect with a low customer complaint rate. The technical characteristics it cites are uniform translucency, stable sintering shrinkage and compatibility with most CAD/CAM systems.

Manufacturing capability is reported at a monthly capacity of 15,000 pieces, with lead times of 15 to 30 working days and a negotiable small minimum order quantity. The company operates OEM and ODM arrangements and states that almost all specifications can be customised. Its stated export markets are the United States, Europe, Brazil, the Middle East and North Africa, with online technical guidance and an after-sales response window of 24 hours. The company was established in 1996 in Beijing, operates a 2,000 m² facility with 80 employees, including 25 engineers working on dental material formulation and process development, and reports annual output of USD 10 million with an export ratio between 40% and 55%.

Company Statement

In its corporate profile, Beijing Weijiahua states:

“Our business principle is mutual benefits, which has earned us a reliable reputation among our customers because of our professional services, quality products, and competitive prices.”

What Laboratory Buyers Should Compare

For laboratories evaluating multilayer zirconia suppliers, the published strength and translucency figures are only the entry point. The differentiating criteria sit in process and documentation:

Sintering window tolerance. A 1,430–1,450°C specification is only useful if the furnace in use can hold that band uniformly across the chamber.

Batch-to-batch shrinkage consistency. Restorations are milled from pre-sintered blanks and only fitted after firing, so shrinkage variation between batches translates directly into seating errors.

Gradient depth and continuity. The relevant question is how far the translucency gradient extends from the cervical to the incisal region, and whether the transition is continuous or layered.

Documentation scope. Buyers should verify not only that a certificate exists but that its declared scope covers the material class being purchased.

CAD/CAM compatibility. The 98 mm disc diameter matches most five-axis dental milling machine

chucks, but clamp and fixture fit should be confirmed against the specific system in use.

Supply continuity. Monthly capacity, lead time, minimum order quantity flexibility and after-sales response time determine whether a supplier can support ongoing production rather than a single order.

Analyst Perspective

Independent market estimates support the direction of travel but differ in scope. Grand View Research places the zirconia-based dental materials market at USD 1.2 billion in 2025, while SNS Insider estimates USD 367.67 million for the same year — a divergence that reflects different segment definitions rather than a disagreement about growth. On the equipment side, Fortune Business Insights estimates the dental milling machine market at USD 2.45 billion in 2025, rising to USD 3.9 billion by 2030, a trajectory consistent with continued CAD/CAM adoption in laboratories.

Taken together, the third-party data indicates that demand growth is concentrated in the laboratory channel, where material consistency — not brand recognition — is the operative purchasing variable.

Closing Outlook

Competition in dental zirconia is migrating from single-metric strength claims to process control. The multilayer gradient approach changes the specification a buyer must evaluate: instead of comparing one flexural strength figure against another, laboratories increasingly compare gradient range, sintering window width and batch reproducibility. For suppliers such as Beijing Weijiahua, whose YIPANG range spans the portfolio from high-strength posterior grades to 57%-translucency anterior grades, the commercial test will be whether that process control holds across volume production and multiple export markets, and whether the underlying documentation remains aligned with an EU regulatory framework that treats most restorative dental materials as high-risk devices.

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