

WIELAND sets new quality standards for blanks

Optimized production process ensures maximum values for strength and translucence

A great deal of expertise is required to produce zirconia blanks for the fabrication of dental restorations. Both the selection of a high-quality, high-purity raw material powder and the use of optimized processing techniques and parameters during the compacting, thermal debinding and pre-sintering of the pressed blanks have a significant effect on the properties of the end product. Scrupulous quality assurance measures before and after each stage of the process ensure that the user and the patient receive a safe, reliable and biocompatible medical product which remains stable over a long period of time.

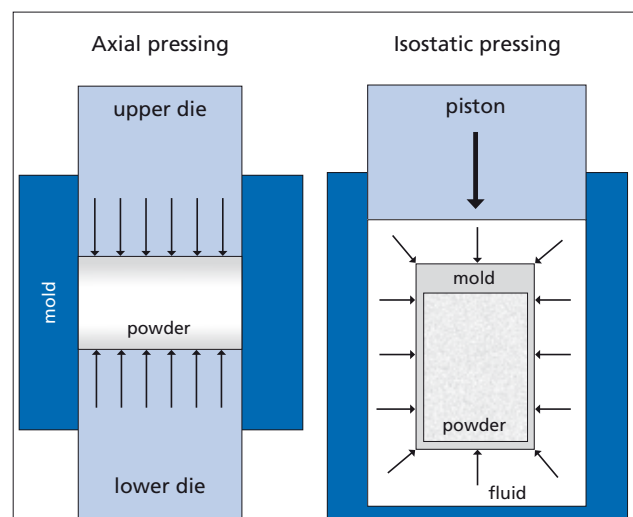
The optimized axial compaction process using a high-power press which is unique in the dental industry delivers excellent results

WIELAND has invested in the latest generation of automated high-performance presses. This heavy-duty hydraulic press weighing over 20 t has been optimized for the manufacture of zirconia blanks, is one of the most powerful presses in use in the dental industry. However, sheer power alone is not enough to meet the most stringent quality requirements. In order to achieve especially homogeneous compaction, the pressure is applied evenly to both sides of the ceramic powder, whereby the two dies are controlled independently of each other and with the greatest possible precision.



By using what is probably the most modern press in the dental field, WIELAND produces blanks of outstanding quality. The extremely high-pressure used ensures that the powder is highly compacted and homogeneous.

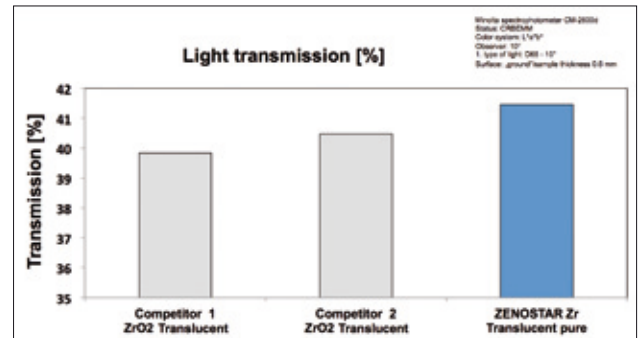
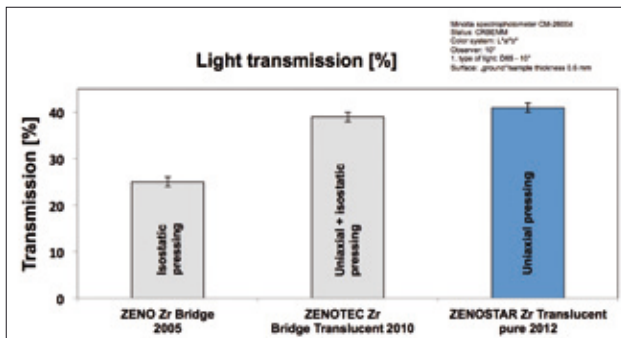
In the so-called axial pressing process, the powder is poured from a feeder into the gap between the mold and the lower die of the tool and is then pressed into the required shape. In the wet bag CIP (cold isostatic pressing) process, however, pressure is applied to all sides of a rubber mold filled with granulate. In this case, the pressed items must be finished after compacting, since the elastic mold can not create a clearly defined shape. But nowadays these two processes can be combined; for example, when the compaction pressure achieved by the axial press is not great enough to obtain the density required for the green blank, the work can subsequently be compacted even further in a second, isostatic pressing process.



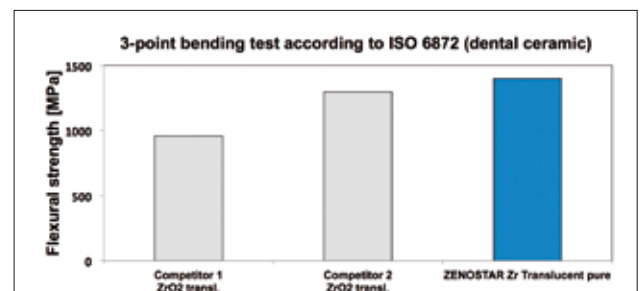
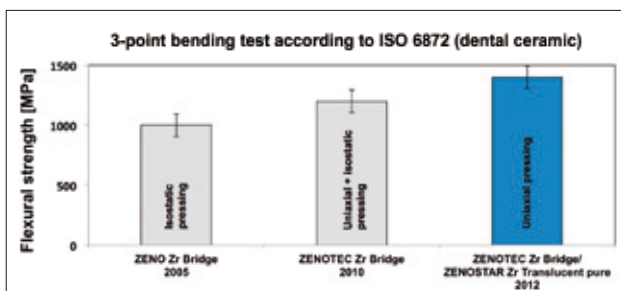
History of the WIELAND compaction process reveals impressive development Further advances in the areas of strength and translucence

Progress

Competitors



The positive development achieved in terms of light transmission (the measure of how translucent the material is) from 2005 to 2012 is an impressive indication that optimizing the raw material powder and the compaction technology/parameters has enabled an increase in light transmission of over 60 % to be achieved. The high translucence is also an indicator of lower residual porosity and consequently of a higher density in the final product. And when compared to the translucent materials of competitors, ZENOSTAR Zr Translucent is truly impressive.



By optimizing the raw materials and process parameters, it has also proved possible to increase the flexural strength of the zirconia blanks by approx. 40 % since they were introduced in 2005. In order to achieve high strength values, it is necessary to obtain a virtually flawless and non-porous structure. A comparison with competitors' blanks reveals the high material quality of the ZENOSTAR Zr Translucent blanks.

That little extra: each blank is individually measured

Unlike many competitors, WIELAND weighs and measures each and every blank. Then an individual label is applied to the blank specifying the exact expansion or shrinkage factor (accurate to four decimal places). This means that a perfect fit can be achieved.



The result: patented ceramic blanks in high-end quality

The graphs above clearly show that it is not just the compaction technology but the entire coordinated and optimized process chain which is responsible for delivering the quality of the end product. The really impressive features of the WIELAND blanks are their high strength and translucence (ZENOSTAR) and the excellent fit achieved by labeling each blank with its individual expansion factor. WIELAND is the hallmark of outstanding quality and provides you with a service that is second to none in the area of quality control. Discover for yourself the quality of ZENOSTAR and the laboratory concepts behind the name.

