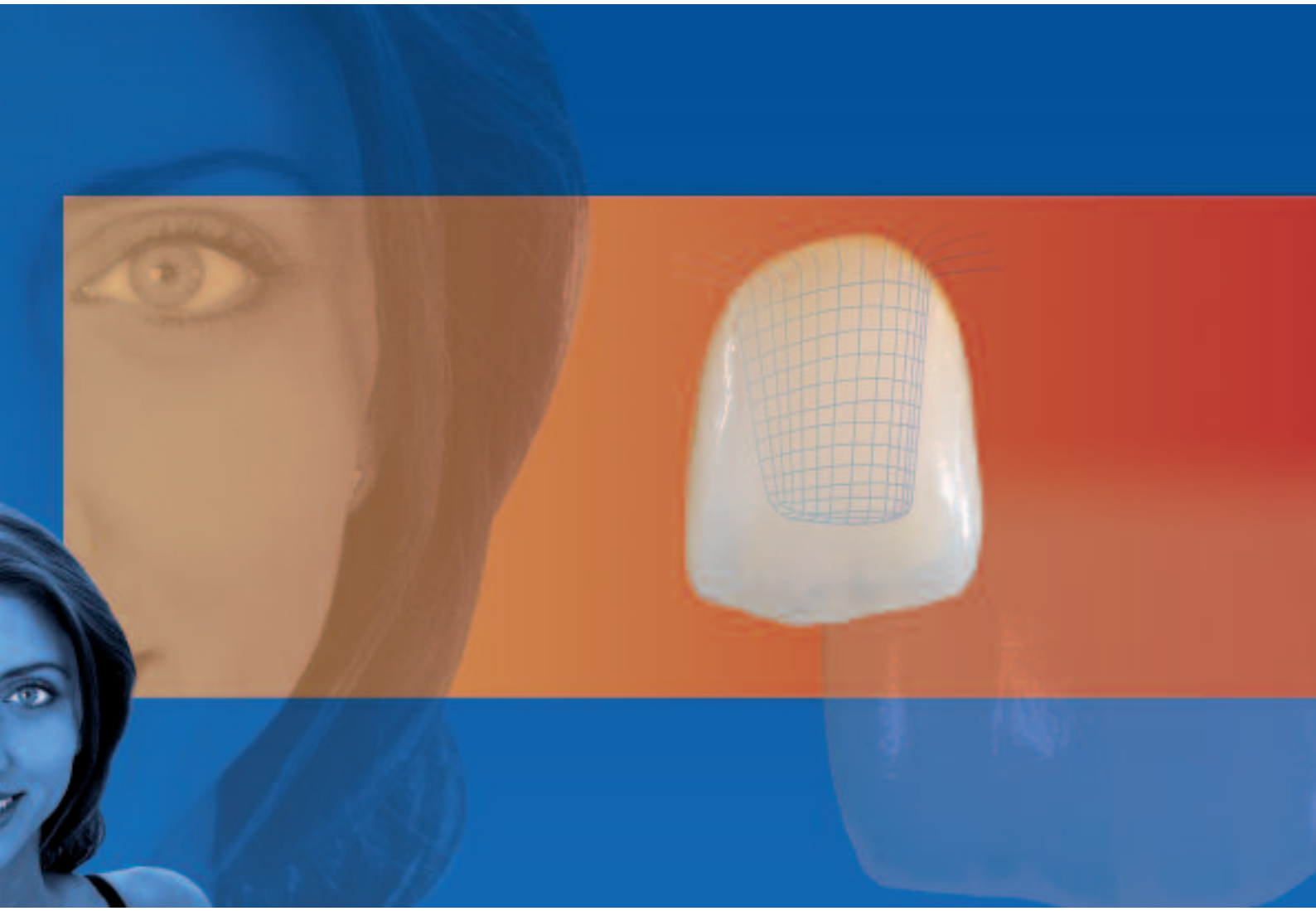
Competence in

All-Ceramics



ivoclar vivadent®

passion vision innovation

The **success story** begins …

All-ceramics have firmly established themselves as the most popular restorative materials in dentistry.

Up until the 80s, gold was the material of choice if dentists and technicians wanted to avoid incompatibilities in patients.

The desire for aesthetics, preservation of tooth structure, and metal-free materials, however, often fell by the wayside. The demand for aesthetics and biocompatibility continuously increased over the next few years and, therefore, the search for adequate solutions for these challenges was intensified.

It was a long way from the first attempts with all-ceramic restorations to today's modern systems and it lead to different materials and processing techniques.

with a **trailblazing** processing technology

1987

More than 20 years ago, the idea emerged to shape ceramic in its heated state.

This opened up new potentials for the design of true-to-nature dental restorations.

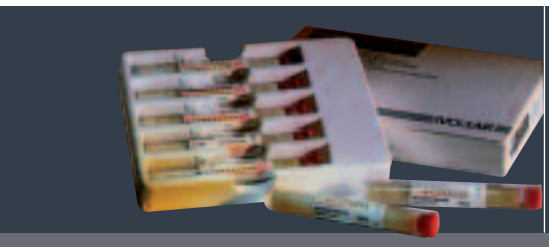
At that time, Ivoclar Vivadent developed the **IPS Empress** leucite glass-ceramic, which permitted the accurate translation from a wax model into ceramic material and thus represented the start of a new processing technology.

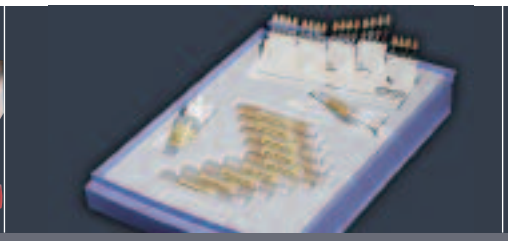
In what is known as the lost-wax technique, the restorations are first contoured in wax. After investment and burning out of the wax restoration, the above mentioned ductile ceramic is pressed into the previously created hollow space by means of a special press furnace.

In combination with IPS Empress, this new forming process or press procedure quickly established itself and convinced users with its manifold advantages:

- High accuracy of fit:
  excellently fitting restorations with optimum marginal seal resulting from adhesive cementation
- High strength:
  for reliability and durable restorations
- Biocompatibility:
  no irritations of the gingiva; no allergic reactions

Desire for an extended range of indications:





1998

The success of IPS Empress in the first few years naturally called for further developments.

The extension of the range of indications was in the foreground – the dream of a **pressed all-ceramic bridge**.

In 1994, the Empress System was expanded with the **TC ingots**. The Translucent Colour ingots were available in 5 shades. Given their translucency and the slight shading, they blended in well with the natural environment.

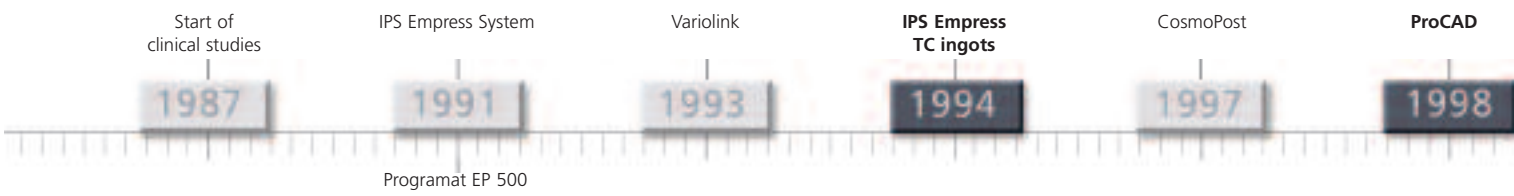
In this way, staining was reduced to a minimum and a good chameleon effect achieved.

The TC ingots were suitable for the fabrication of inlays, onlays, crowns, and veneers in the staining technique.

With **IPS Empress 2**, Ivoclar Vivadent landed another great development in the field of dental glass-ceramics in 1998. The innovative material was based on a new chemistry.

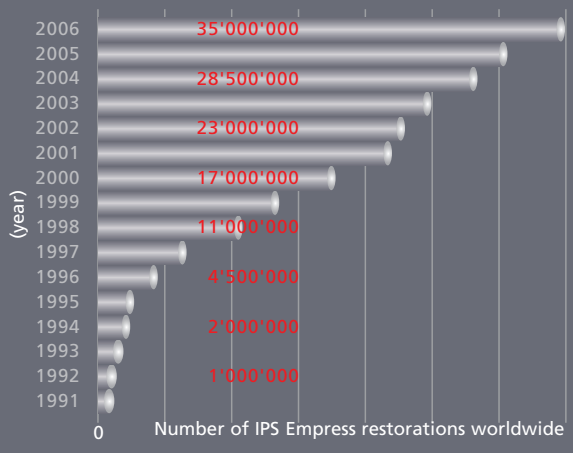
The high lithium disilicate crystal content in the glass matrix results in a high strength that permitted the extension of the range of indications to include bridges for the anterior and premolar region.

For the layering procedure to achieve outstanding aesthetic results, the coordinated IPS Empress II and IPS Eris for E2 layering ceramics were developed.



IPS Empress – a **tried-and-tested** system

Since its introduction, IPS Empress has revolutionized the all-ceramic technology and has fired discriminating users and patients around the globe with enthusiasm until today.



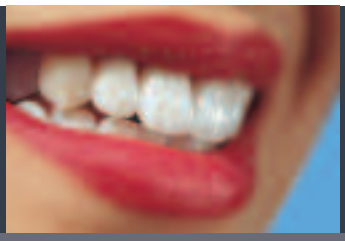
Its aesthetics and functionality have served as role models for years, because the appealing optical qualities of IPS Empress played a major role in achieving its considerable fan base, together with its excellent clinical properties.

In this way, IPS Empress has advanced to become the quality standard for metal-free ceramics over the years and has been copied countless times. Today, IPS Empress is still the world market leader in the sector of all-ceramic materials.

In addition to the **press furnaces** essential for the processing of the ceramic ingots, a wealth of other products coordinated with the ceramic were developed over the years in conjunction with IPS Empress, such as the **Variolink** luting composite that has been successfully used for years.

1998 saw the entrance into the CAD/CAM technology with **ProCAD**.

Press and CAD/CAM technology –



2004

Given the continuing market success and the advancing market acceptance, the press technology has become the state-of-the-art processing technique of today.

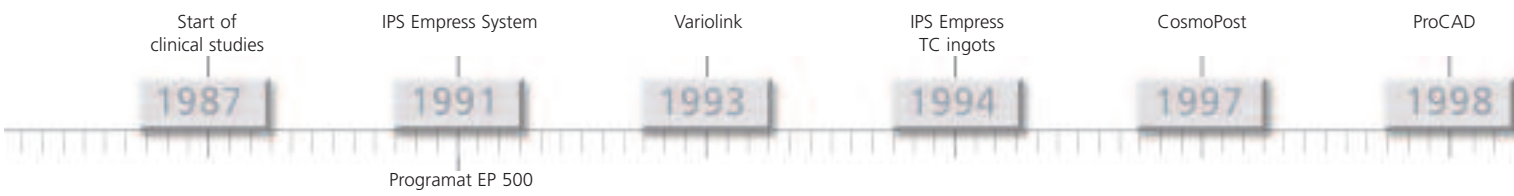
It has also received additional new impetus recently by the new trend of using the press-on technique on ceramic or metal frameworks.

IPS Empress Esthetic

The IPS Empress System was also continuously developed and gave new stimuli to the market with regard to aesthetics, functionality, and processing behaviour.

Thanks to modified and optimized fabrication procedures, the technical properties of the products, such as homogeneity and strength, were further enhanced over the years, which resulted in the market launch of the highly aesthetic IPS Empress Esthetic in 2004. At the same time, new technical advancements and years of experience were used for the production of press furnaces and implemented in the construction of new models, such as the Programat EP 5000.

The improved homogeneity and density of the leucite crystals in IPS Empress Esthetic promote the true-to-nature light scattering of the material and provide a balanced chameleon effect. Consequently, veneers, inlays, partial crowns and crowns blend into the natural environment to an even higher degree.



in the all-ceramic sector

2006

IPS Empress CAD
Parallel to the press technology, an increasing number of **computer-aided fabrication systems** have been developed by the dental industry. They permit optimum processing of glass-ceramic materials.

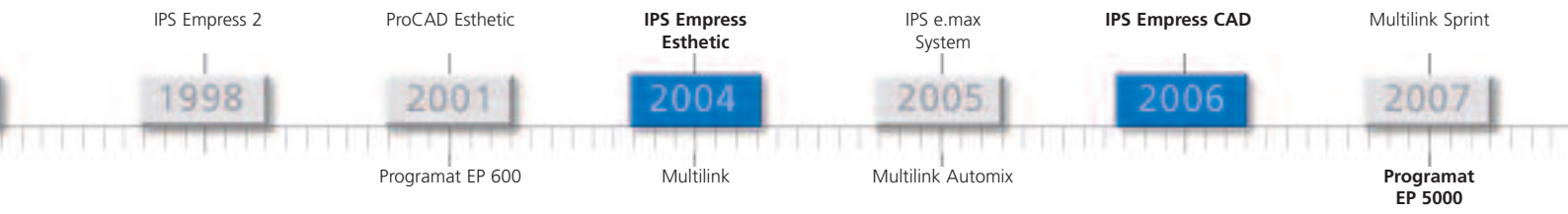
It goes without saying that this went hand in hand with further developments in the field of dental materials.

IPS Empress CAD
Since 2006, the corresponding innovation from the IPS Empress world has been known as IPS Empress CAD, a leucite-reinforced glass-ceramic block for the CAD/CAM technique.

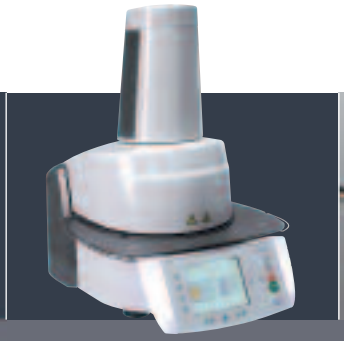
It is based on the same material technology as IPS Empress Esthetic and thus benefits from a material that has been tried-and-tested for years. Same as for IPS Empress Esthetic, the semi-finished product in powder form is pressed to blocks in a fully automated procedure and subsequently ceramized in the IPS Empress CAD production process. The finished product is then milled to accurately fitting single tooth restorations in a CAD/CAM device and subsequently characterized by staining, if desired.

The highlights of the IPS Empress CAD range of products are the polychromatic IPS Empress CAD Multi Blocks with a life-like shade and fluorescence transition from dentin to incisal.

Twenty years of successful clinical studies with leucite glass-ceramics and more than 35 million incorporated IPS Empress restorations throughout the world speak for themselves and for the ongoing success of the material.



Progress continues …



2005

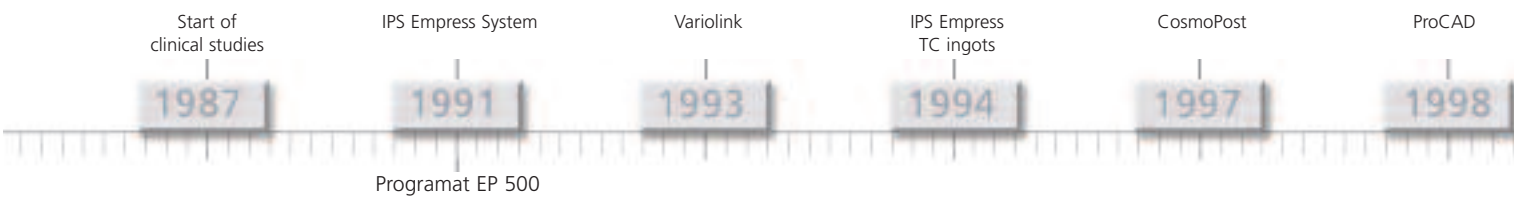
With the introduction of the all-ceramic IPS e.max System in 2005, Ivoclar Vivadent has again set a new standard in the field of dental ceramics.

IPS e.max is a modular all-ceramic system which combines the traditional press technique with the CAD/CAM technology and which consists of high-strength materials with outstanding aesthetic properties. The system components are compatible with each other. Depending on the indication and processing technology, users may choose between glass- and oxide-ceramics.

In order to achieve such a feature, new paths had to be treaded - not only in material development, but also in process engineering.

The two new disilicate ceramics of the IPS e.max System are fabricated in a production procedure unique in the dental industry. The high crystal density of the **IPS e.max Press** and **IPS e.max CAD** glass-ceramic materials results in outstanding mechanical properties and strength values of 360–400 MPa, without compromising the optical quality.

Given their high strength, the highly aesthetic glass-ceramic restorations can be conventionally cemented, e.g. using the new self-adhesive **Multilink Sprint** resin cement, which greatly facilitates the use of all-ceramic in the dental office.

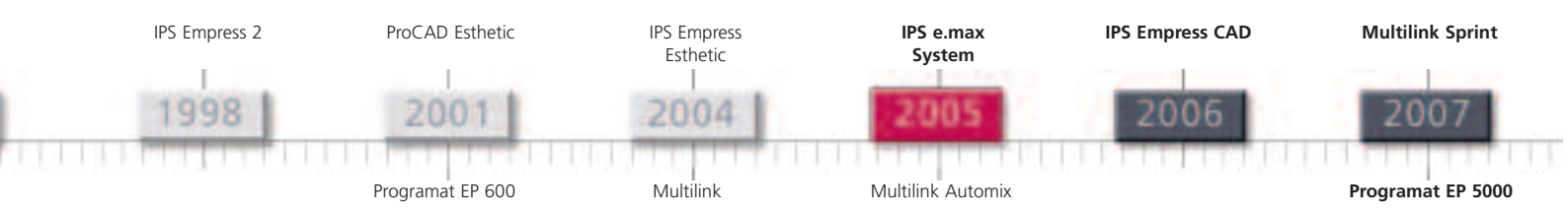


2006

Prof. Dr. D. Edelhoff / O. Brix

The **IPS e.max ZirCAD** zirconium oxide blocks for the CAD/CAM technique and the highly aesthetic **IPS e.max ZirPress** fluorapatite ingots for the press-on technique are another two components of the IPS e.max System. In this way, the advantages of the press technique are optimally combined with those of the CAD/CAM technology. With its high strength, zirconium oxide can also be used for all-ceramic bridges in the posterior region and thus ideally rounds off the IPS e.max System.

The combining element of the IPS e.max System is the **IPS e.max Ceram** nano-fluorapatite layering ceramic, which can be used to characterize or veneer all the IPS e.max components and thus helps achieve the highly aesthetic appearance of the accurately fitting restorations – regardless of the framework material used.



The **results** speak for themselves...

Shigeo Kataoka, Osaka, Japan

«IPS Empress allows the fabrication of all-ceramic restorations that harmoniously blend into the oral environment.»

Jürgen Seger,
Ivoclar Vivadent AG,
Liechtenstein

«IPS Empress Esthetic allows high-quality ceramic veneers to be fabricated using an effective and efficient technique.

Their optical appearance completely convinces patients and experts alike».

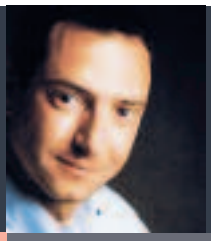
Lee Culp,
USA

«IPS Empress Esthetic materials provide a systematic way to achieve phenomenal esthetic results in an extremely simple technique.

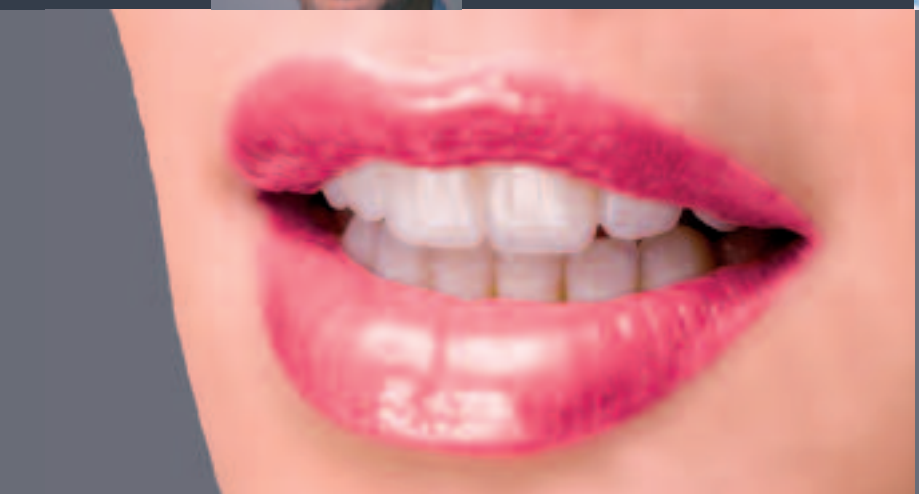
It's not complicated, and it's not time consuming. It's elegant simplicity.»

... and are confirmed by **users**.

Prof. Dr. Daniel Edelhoff, Germany



Oliver Brix, Germany



«With IPS e.max Ceram, it is possible to veneer different all-ceramic restorations with one layering ceramic.

Users may flexibly choose between highly aesthetic glass-ceramics and high-strength zirconium oxide and fabricate even the most complex restorations with optimum shade match and an outstanding aesthetic appearance. The choice between adhesive and conventional cementation greatly facilitates the work in the dental office.»

Volker Brosch, Germany

«The turning-point in dental lab technology is also evidenced by new, innovative materials, such as zirconium oxide.

Consequently, IPS e.max ZirCAD is a zirconium oxide framework material that is fully integrated in the IPS e.max all-ceramic system and that benefits from the diverse options presented by the system.»

Hervé Maréchal, France

«IPS e.max permits the combination of a new pressed ceramic generation with the world of zirconium oxide.

The combination of two techniques for one restoration with different framework materials facilitates the tasks that usually come up during the fabrication of complex restorations.»

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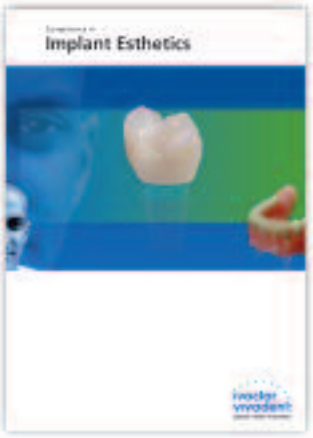
Competence in
Composites



Competence in
Implant Esthetics

Competence in
All-Ceramics

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