

SMILE ARKANSAS

A close-up photograph of a person's mouth, smiling broadly to reveal a set of bright, white, uniform teeth. The lips are a healthy pink color. The background is a soft-focus outdoor scene with green foliage and a blue sky. The text is overlaid on the lower half of the image.

**The Life-Changing
Benefits of
Porcelain Veneers**

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*“Sometimes your joy
is the source of your smile,
but sometimes your smile
can be the source of your joy.”*

–Thich Nhat Hanh

What Are Porcelain Veneers?

A smile makeover using porcelain veneers is a commonly requested cosmetic dental procedure and for good reason. Veneers can be used to correct a myriad of cosmetic dental problems such as discolored, chipped, worn, crooked or spaced teeth. Porcelain veneers, sometimes called porcelain laminates, are thin layers of dental porcelain used to replicate the natural look of healthy teeth. They are used to cover the front and sometimes side surfaces of teeth improving their appearance and function. Their strength and resilience are comparable to natural tooth enamel and is the material of choice for smile makeovers. Porcelain veneers resist stains and can be made to mimic the light reflective properties of natural teeth.

When bonded or adhered to natural teeth, porcelain veneers can create an amazing smile transformation.

Smile makeovers using porcelain veneers have become a collaborative process involving input from the patient, treating cosmetic dentist and dental technician. For the best results the cosmetic dentist



10 porcelain veneers were used to achieve an incredible smile transformation.



Each individual veneer is very thin and covers the front of the natural tooth.

will discover the patient's expectations and involve the patient in planning for their smile makeover.

Porcelain Veneers are fabricated by a dental technician under the direction of the treating cosmetic dentist. The technician and dentist work closely together as each veneer is prescribed to meet the smile design plan for each patient. The smile design can be highly customized and include shade mapping, degree

of translucency, length, shape, contours and surface texture of each veneer.

The treating cosmetic dentist will provide the technician a very accurate mold or impression of the patients prepared teeth. The mold is used to make a very hard plaster model which is an exact duplicate of the patient's teeth. Depending on the type of porcelain system used, the technician will add porcelain of different colors and translucencies with the proper shape and contours to the patient's model to mimic natural tooth enamel. Once the porcelain is proper added to the model, it is then placed in a porcelain oven and fired under high temperatures to harden the veneer. The technician will then shape and polish each veneer to create a natural look according to the patient's smile design.

Porcelain veneers have similar properties of glass with high compressive strength and low tensile strength. Compressive strength is a measure of a material's hardness and tensile strength is a measure of flexibility without fracture. Porcelain veneers by themselves will resist fracture due to their hardness but are prone to fracture if placed under flexion (bending) due to their low tensile strength. Though porcelain

veneers can be somewhat fragile by themselves, once they are properly supported and bonded to a natural tooth they resist flexion and are quite durable and long lasting.

History of Porcelain Veneers

Porcelain veneers are the latest and most technologically advanced type of the dental veneers. Dental veneers were originally made out of acrylic. Today dental veneers are made directly out of composite resin (a plastic) and indirectly out of porcelain. A direct veneer made of composite resin is hand sculpted by a cosmetic dentist directly onto the patient's natural tooth. A porcelain veneer is by far the most commonly used dental veneer due its superior esthetics and long lasting durability. An indirect technique is used to make porcelain veneers. An exact duplicate model of the patient's teeth is used to indirectly fabricate porcelain veneers.

Dental veneers, originated in California in the 1930's, were used to improve the smiles of movie stars so they would look better on camera. Beverly Hills dentist Dr. Charles Pincus invented dental veneers in 1928. A pioneer in the field of Cosmetic Dentistry, Dr. Pincus

created the first dental veneers out of thin layers of acrylic. These tooth colored dental veneers were temporarily placed over the actor's natural teeth with denture adhesive. Today a Hollywood smile is not just for the rich and famous but available to practically anyone who wants to improve their smile.

In 1955, Michael Buonocore, a researcher at the Eastman Dental Center, in Rochester New York, observed that the application of a weak inorganic solvent to enamel could alter its surface. This microscopic etching of enamel would allow for bonding of an adhesive such as a resin to the enamel surface. Buonocore originally experimented with acrylic resins but found the bond strengths too weak to use in the mouth. It was not until Dr. Rafael Bowen developed the first effective dental composite resins in the 1960's, that Buonocore's discovery could be effectively utilized. This technique, called acid etching, is used today to prepare the enamel surface with 37% phosphoric acid for bonding porcelain veneers.

Research started by Simonson and Calamia in 1982 discovered that porcelain could be etched with hydrofluoric acid. Bond strengths were improved dramatically with this breakthrough discovery allowing

porcelain veneers to be bonded to enamel. An article written by Calamia confirmed this discovery by describing a technique of fabricating porcelain veneers on a refractory model using platinum foil as a separating medium. Once the veneers were fired under high heat in a porcelain oven they became hardened and could now undergo etching with hydrofluoric acid.

These three discoveries, etching of enamel with phosphoric acid, development of composite resin as an adhesive, and etching of porcelain with hydrofluoric acid led to the development of modern techniques used by cosmetic dentists today to predictably adhere porcelain veneers to natural teeth. Though the original technology of etching enamel and porcelain hasn't changed much over the years, there has been continual development of the composite resin adhesives and porcelain systems themselves. Fifth generation composite resin adhesives are now used to achieve the highest bond strengths to not only enamel but the softer deeper layer of tooth structure called dentin.

Types of Porcelain

Over the last few years there have been some exciting new developments in porcelain systems themselves. Dental ceramics are inorganic crystalline-structured materials. The original porcelain veneers, made of feldspathic porcelain, were fabricated by stacking wet porcelain powder on a refractory model using the platinum foil technique and fired under high temperatures in a porcelain oven. Though very esthetic, feldspathic veneers were somewhat difficult for dental technicians to fabricate and could be prone to fracture having low flexural strength (60-70 MPa). Megapascal units (MPa) are used to measure flexural and bond strengths. This type of veneer is most successful when 50% or more of the bonding substrate is enamel and 70% or more of the margin is in enamel (McLaren). Though still used today, feldspathic veneers are generally used by master ceramic technicians and experienced cosmetic dentists using conservative preparation techniques to achieve beautiful results.

The newer porcelain systems have been developed to provide for ease of fabrication by dental technicians, advanced esthetics and higher flexural strength and durability. Porcelain can be stacked, milled or pressed

into the proper veneer form. The goal for some of these newer systems is to increase flexural strength without sacrificing esthetics. Types of porcelain with their corresponding flexural strengths are:

- **Feldspathic** (60-70MPa), Creation Porcelain (Jenson), Ceramco 3 (Dentsply), EX-3 (Kuraray Noritake)
- **Leucite Re-inforced** (120MPa), IPS Empress (Ivoclar Vivadent), Authentic (Jensen)
- **Lithium Disilicate** (360MPa), IPS e.max (Ivoclar Vivadent)

Feldspathic – this type of porcelain allows the masters technician to showcase their artistic capabilities. Different shades and translucencies of porcelain as well as intrinsic characterization are layered into each veneer giving the ceramist the greatest range to create natural effects to mimic natural tooth enamel. Ideal for the patient who requires the highest of esthetic standards for natural looking veneers. Best used on teeth with minimal or no preparation and bonded to enamel only to insure the highest bond possible due to its lower flexural strength. Should not be used to

lengthen teeth or used on a patient that has a history of grinding (bruxing).

Leucite Re-Enforced - The brand IPS Empress, developed in 1991 by Ivoclar Vivadent, has over 25 million restorations placed worldwide. Stronger than feldspathic porcelain but can be made as thin as .3 mm. This porcelain is pressed in monochromatic form but since it is so thin will pick some of the colors of the underlying natural tooth making it very esthetic. Using a cut back technique in the edges and interproximal, layers of translucent or different hue of porcelain can be added to the body of the veneer to give it a more natural look. Authentic by Jensen is another popular brand of leucite re-enforced porcelain.

Lithium Disilicate – The brand IPS e.max, developed by Ivoclar Vivadent in the early 2000's, has twice the flexural strength of leucite re-enforced porcelain and is ideal for patients who grind their teeth. It can be pressed or milled with CAD/CAM technology. It can be used as a monolithic restoration or layered for beautiful esthetics. E.max can be used for veneers and full crowns and has become the most popular type of porcelain requested today due to its strength, durability and excellent esthetics.

Other porcelain systems of note are In-Cream's Alumina (aluminum oxide) and Zirconia (zirconium and aluminum oxide). These ceramics though very strong and durable, can't be etched making them unsuitable for porcelain veneers use but ideal for full coverage crowns. An experienced dental technician will have an in depth understanding of these different porcelain systems and will be able to collaborate with the cosmetic dentist to provide excellent porcelain veneers.

Types of Porcelain Veneers

The types of porcelain veneers available have more to do with the preparation or non-preparation of the natural teeth being treated not the porcelain itself. There are basically three types of porcelain veneers, traditional veneers, "minimal prep" and "no prep" veneers. Minimal prep and no prep veneers are very similar and are grouped together for our purposes in this text.

Traditional veneers offer the greatest flexibility in treating a wide variety of cosmetic dental concerns, such as discolored teeth, gapped or spaced out teeth, worn or broken teeth as well as crowded or crooked

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teeth. Traditional veneers are extremely effective when wanting to make significant changes in your smile since each tooth visible when you smile can be treated. Smile transformation with traditional veneers can be incredibly beautiful. These porcelain veneers are custom made by the technician as prescribed by your cosmetic dentist to fit your smile design. Traditional veneers require the natural teeth be prepared or shaved back so to make room for the thickness of the new veneers. Even though this procedure is considered irreversible, many times the reason for considering porcelain veneers in the first place is because the teeth are worn chipped or broken. If your teeth are fairly healthy other options should first be considered like whitening, orthodontics with braces or removable aligners or “no prep” veneers. These more conservative

**BEFORE****AFTER**

Brian, a young baby-boomer, had worn his teeth down over time by regular chewing and night time grinding. Traditional porcelain veneers gave him a healthier youthful smile.

treatments do not alter your natural teeth and may be a better solution than traditional veneers.

“Minimal Prep” or “No Prep” veneers are alike in some ways to traditional veneers in that they are bonded to natural teeth but require no or minimal preparation or removal of tooth structure. Not everyone is a candidate

for these types of veneers though. The best results are for people who have small, short or spaced out teeth. Adding porcelain to these teeth to make them a normal size is an ideal treatment option. If “no prep” veneers are used for patients with normal size teeth the results may be less than ideal. Adding porcelain to normal size teeth may make them appear too thick, too bulky too or too long. People with normal size teeth should consider other treatment options including traditional veneers. “No prep” veneers can be used for people who grind their teeth but with caution, especially if the patient wants their teeth to be lengthened. Traditional veneers may be a better treatment option for people who grind. “No prep” or “minimal prep” veneers take a higher skill level from the treating dentist and dental technician to get good results. These veneers are usually thinner and more fragile

**BEFORE****AFTER**

**BEFORE****AFTER**

Tori, a high school senior, had always avoided smiling because her teeth were discolored, too small and spaced out. She was an ideal candidate for “No Prep” veneers. Her amazing smile transformation was achieved without any shots or drilling of her natural teeth.

than traditional veneers making them more difficult to handle and place. Though once bonded to enamel, “no prep” veneers can be very strong and durable. An experienced cosmetic dentist can provide proper guidance and recommendations for the best treatment options available.

Lumineers: There seems to be much confusion about the difference between porcelain veneers

and Lumineers to the general public. The truth is Lumineers are just a brand of porcelain veneers. Many dental laboratories have attempted brand their porcelain veneers as special and unique, marketing to dentists and the general population. The DenMat corporation sells dental products to dentists and also have a dental laboratory which makes Lumineers. They have marketed Lumineers heavily throughout the world and made more porcelain veneers than any dental laboratory in the world. Lumineers are marketed as a “No Prep” veneer but in reality can also be used in traditional veneer application. The DenMat laboratory is a large production facility which appeals to the mass market by producing a generic veneer at a reasonable cost. The patient looking for a natural highly individualized look of porcelain veneers should consult with a cosmetic dentist who uses a dental technician who is not volume oriented and provides more customized services.

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