

Problem Solvers 44 New Vistas in Dental Crowns-Computer designed and milled while you wait!

Synonyms: computer -milled crowns, zirconia crowns, Bruxzir, Cerec, Sirona, E4D. CAD/CAM.

What is this new machine that can get me a crown in 1 day?

My dentist says I need 4 crowns and he can do them in one day.

This is a CAD/CAM machine, which stands for Computer Aided Design and Computer Aided manufacturing. This machine can scan and send virtual data of a tooth to a milling chamber where the final restoration is carved out of a solid block of zirconia or porcelain. CAD/CAM machines allow a crown, bridge or veneers to be fabricated while the patient remains in the dental office. The drawbacks of this technology are that there are still questions that remain about the quality of the margins created with some of these machines but some of the latest milling technologies are producing excellent results.

These machines are very expensive and are not cost effective for most dental offices. Another disadvantage is the availability of limited blocks of porcelain shades. So if the color is off a bit the dentist may add surface stains to the blocks and fire them in the oven. This stain can wear off over time so for very esthetic crowns, it is still better if the ceramist can layer color within the crown so it will remain natural looking for years.

I had a milled crown put in and it looks very dull, is this normal?

Some zirconia crowns are very monochromatic or one colored. These are very strong crowns but are not always the most cosmetic.

My dentist says they use all milled fillings in their office but they are a lot more expensive than a regular filling. Are these better and will they last longer?

Fillings that are too big will not last as long as a milled precision filling. These fillings are called inlays or onlays and they can be made to match the contours of your teeth better than a larger traditional filling. Traditional composite "white" fillings will last between 5-7 years if they are not in high stress areas like the edges of front teeth. A well-milled and cemented restoration can last 10-15 years or longer; that being said, there is no guarantee as to how long any restoration will last. This is because a lot depends upon how they are maintained.

When should I consider a milled filling?

When the width of the filling is 50% or greater of the remaining tooth, the better restoration would be the milled restoration or a cast gold restoration.

Using CAD/CAM technologies can allow a dentist to use a scanner and have the image sent digitally to the lab. This will lower lab costs and may help reduce the fees associated with these types of crowns.

How do CAD/CAM machines know how to build the teeth to the correct sizes and shapes?

When a dentist prepares a tooth they take photos of the teeth and they are uploaded to a computer. From here the dentist can use libraries of teeth and occlusions to create a virtual representation of the desire tooth. The CAD software will allow the dentist to design the biting surface in three dimensions, the shape of the contacts with the adjacent teeth and the size of the teeth. Then the restoration design is sent to the milling station where it will replicate the 3D design on the computer. The restoration will then be stained, glazed and fired in a ceramic oven before it is finished and polished.

What is a Zirconia crown?

A milled crown made out of a Zirconium oxide material that is strong and durable and metal free.

How long have these restorations been available?

Cerec restorations have been around for 20 years. They are present in more than 28 dental schools and are used by more than 17,000 dentists.

What are the types of Zirconia crowns on the market today?

Lava,(3M ESPE) Cercon(Dentsply), Emax ZirCad(Ivoclar Vivadent, Procera Zirconia, Everest, Zeno and Vita YZ.

How long do CAD/CAM crowns last.

In a study at the University of Michigan it was found that at 3 years these restorations demonstrated a 100% survival. In a study at the University of

Washington Seattle after evaluating 10,999 Lava Zirconia crowns there was a 99.2% success rate at 7 years of service.

Are Zirconia crowns made out of one solid block?

For back teeth where esthetics are not as important a solid Zirconia crown may be used. These are called monolithic crowns as they are made out of one material. They are indicated for people with limited room in the back of their mouths, people that grind or brux their teeth at night, and teeth which are dark that need to be covered so the underlying tooth structure can be blocked out.

The advantage of solid Zirconia CAD/CAM crowns is that they have a high fracture and wear resistance. They also have an excellent fit and require less tooth reduction than a traditional porcelain fused to gold crown. There is less labor involved in making them so they can be a more cost effective crown option.

Richard B. Winter D.D.S.M.A.G.D.D.I.C.O.I.
Master Academy of General Dentistry
Diplomate International Congress of Oral Implantologists
WWW.WINTERDENTAL.COM