

## STRENGTH COMPARISONS BETWEEN DIFFERENT TYPES OF RESTORATIONS ©

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As technicians, we are often asked the question: “What is strongest? PFM, PFZ or e.Max?”

This question does not have a simple answer, because it depends on WHY you are prepping the tooth in the first place. e.g. in what way do you want the patient to benefit from the restoration? There are many different reasons why you may be prepping teeth. Sometimes you are prepping a perfectly strong and healthy tooth simply because the patient wants to improve the color. At other times, you are prepping a tooth because it is structurally compromised, and it needs a restoration to keep it together. Your choice of materials will then depend on the primary reason for restoring the tooth in the first place.

The answer to the question “What is strongest?”, also depends on what you, as a health practitioner, consider to be a failure? For example, do you consider a small porcelain chip to be a failure of the whole restoration? Does the crown need to be replaced because the porcelain chipped? Or does the whole thing have to break into pieces before it “fails”? You must ask yourself this question before you choose material because it impacts strongly on your choice.

Instead of “What is strongest?”, consider “What is the most appropriate material to use in each individual case?”.

To answer this question, you need to intimately understand what each material (or combination of materials) is good at, and you need to decide what you and your patients’ personal priorities are; strength, aesthetics, etc. The beginning of the learning process must then start with knowledge of material properties.

Let us begin with e.Max (or, more appropriately, Lithium DiSilicate):

Translucent Lithium DiSilicate (which is the only type of e.Max that we use here at Shanto) i.e. “LT”, “Value”, and “HT” ingots, is designed as a monolithic “veneering” material. It can be used for both crowns and veneers (not recommended for bridges) but is not particularly strong in itself (300-400MP). It relies on the underlying tooth structure for support with both color and strength. Therefore e.Max works best if the tooth (stump) underneath is strong and vital, within one shade of the desired shade, is prepped relatively “conservatively” (0.7mm – 1.4mm reduction), and is bonded to the tooth. In other words, if the tooth underneath is compromised (e.g. broken, RCT’d, dark in color, etc.) and cement is used rather than bonding material, then the e.Max restoration is also compromised.

Another way of saying the same thing is this: An e.Max restoration that is cemented to a root canal treated tooth may make that tooth *look* better, but it does not help to improve the structural integrity.

Hence, if your priority is aesthetics, and the tooth in question is strong and with good color, then e.Max is the perfect choice. If your priority is aesthetics, and the tooth underneath is compromised (although with good color) then e.Max may still be a good choice, however, you must inform the patient that the choice of material is to satisfy the aesthetic priority (not any kind

of structural priority). If they agree to that, then they must own that choice, and the accompanying responsibility.

Crowns that have porcelain fused to a metal core (PFM) or porcelain fused to a Zirconia Core (PFZ) may be vulnerable to porcelain chipping, but their CORES are strong in themselves (900 – 1500 MP) and they actually help to improve the structural integrity of compromised teeth. If you then have a clinical need to improve the structural integrity of the tooth, but still have reasonably high demand for aesthetics, a PFM or a PFZ maybe your best choice. However, you should inform the patient that the choice of having porcelain in the visible areas is to satisfy the aesthetic demand and that there is a risk associated with this choice. Although the core is strong enough to provide the necessary structural support, the porcelain may chip. If they agree to that, then they must own that choice, and the accompanying responsibility.

Crowns made with monolithic metal (FGC), or made with monolithic Zirconia (FZ), do not rely on the underlying tooth for support. They are strong in themselves (900 – 1500 MP) and they, whether cemented or bonded, actually help keep compromised teeth together and they improve the structural integrity of the whole construction. If your primary priority is a clinical need for structural integrity, and the aesthetic priority is limited (or none), then an FZ Crown or a FGC may be the best choice. However, it does not hurt to remind the patient that the choice of material is to satisfy the need for structural support, it is not for aesthetics.