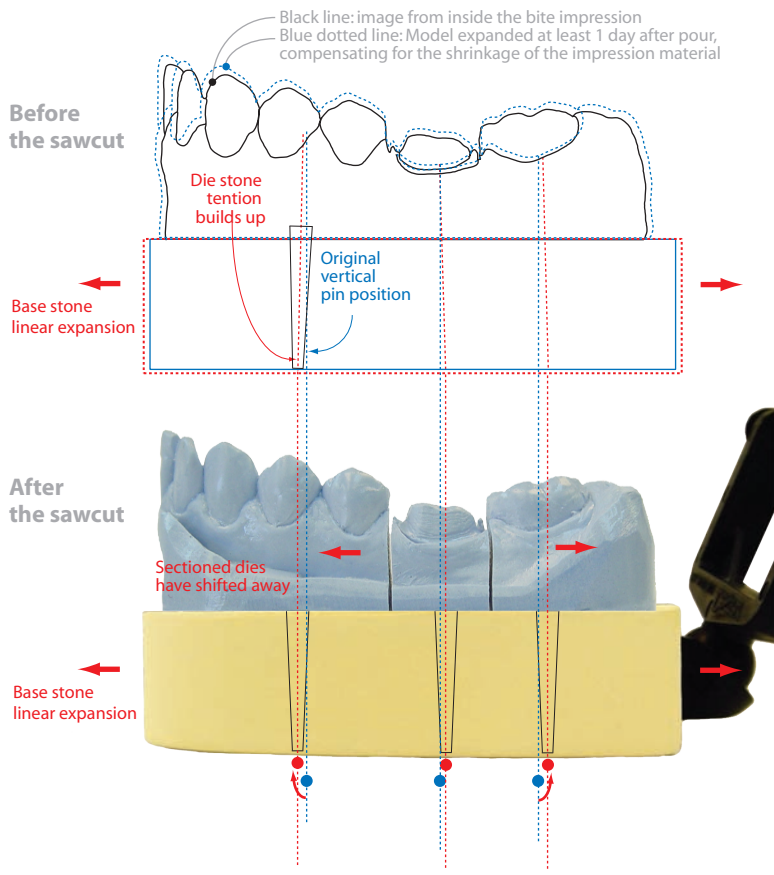


# Crowns & Bridges are dimensionally more accurate on a Non-expanding, pre-manufactured Base

## The problem with the current stone-base systems



### 1. Double linear expansion

It is generally understood that some degree of die stone expansion will help compensate for the shrinkage of impression material (average shrinkage of 0.03 - 0.2%). This creates a positive relationship wherein the model closely mirrors the patient's mouth. A secondary and excessive expansion (sometimes for days!) of the base stone (lab stone), however, pulls the pins horizontally and leaves a high chance of model distortion.

Generally, **lab stone expands more than die stone** because of the irregularity of the gypsum crystals and the larger surface area. In addition, since the stone base is usually poured one day after the die stone, it creates a secondary expansion. This expansion is in excess of the die stone expansion because of the difference of setting times. Even if you can't see the growth of the stone with your bare eyes, it may expand to such an extent as to cause model distortion. This distortion is aggravated further by using a high expansion lab stone and using less than the recommended amount of water in your water/powder ratio.

### 2. Dies become vertically shifted

Anyone who has worked with models in a lab has experienced tight re-registration of whole (un-sectioned) models, both quadrant and full arch, when put back into the stone base. Matching the pin tips back into the pin holes created in the stone base is vertically challenging if the dies have not been sectioned. This is due to the tension created around the pin during the lab stone expansion. The expanding lab stone shifts the pins causing stress. This stress is released when the model is sectioned, and the dies are "shifted away" from their original position. This misalignment is caused by the secondary lab stone expansion.

Dental labs that use low expansion lab stone and control the water to powder ratio may experience far less or even none of these problems. However, labs that use a relatively high expansion base stone, especially if there is inconsistent measuring of the water to powder ratio, will likely have distortion in their models. This problem is difficult to diagnose since it may or may not be consistent. Addressing it, however, is very important as it may be one of the leading causes of high occlusion and interproximal contact problems associated with the lab.

## Base Stone Expansion

Due to the fact that actual stone growth is hard to measure and can't easily be seen with the naked eye, these factors are often neglected. If your model seen inexplicably inaccurate in regards to contact and occlusion, it is likely a result of the secondary lab stone expansion.