The Myth of Quartz

For the past 20 plus years, lab owners and technicians alike have been told that quartz wound muffles provide superior firing performance over open wire muffles; that a quartz muffle maintains a more even temperature and has a longer operating life than the less expensive open wire muffle.

I have owned a dental lab equipment repair center for 15 years and in that time have serviced almost every make and model of porcelain furnace in the dental lab industry many times over. I have discussed this topic hundreds of times over the years with lab owners and technicians using every make and model of porcelain furnace. Based on these conversations and my own hands-on experience with both quartz and open-wire muffles, it is my conclusion that a quartz muffle offers little to no advantage over the open-wire design.

So, why quartz?

Great question. But first, some background information. The quartz muffle has been with us since the early 1970's. For those of you reading this article that have been in the dental lab industry since the 70's and 80's, I would like for you to name some of the oven manufacturers that were around then, and to think of the ovens that you used. Which ovens were the Cadillacs of their day, which ones were the more cost-effective production ovens? Now, how many of all the ovens in that 20 year period had a quartz muffle?

With rare exception, the answer is none: Ney offered a quartz muffle option for its Mark II and III furnaces. It is important to note that the quartz muffle more or less exploded on the scene in the early 90's. One could argue that it was the cost of manufacturing or the state of the technology that kept quartz muffles from being popular during that time. While these reasons are plausible, it is my assertion that the use of the quartz muffle came about more as a band aid, *not* a technological move forward.

The materials that were popular in the late 80's and early 90's for PFM work used a combination of high silver content and other compounds that would gas off during the various firing stages. As the compounds gassed off, they would attach to the open wire muffle and contaminate the wire, similar to the effects seen on the heating plates of burn-out ovens. The open wire heating element would become brittle and sensitive to the continuous expansion and contraction caused by the numerous firing cycles, causing open-wire muffles to fail at higher than normal rates.