

Scaler vs. Scaler

Magnetostrictive or piezo ultrasonic scaler, which one is right for my practice?

by Michael Karter, DDS



How they work.

The Basics: All ultrasonic scaling devices work by vibrating a pointed or specially-shaped metal or plastic tip very quickly, to remove accretions like plaque and calculus from the supra-gingival and sub-gingival parts of a tooth. It is the physical motion that removes these deposits. This motion can be created in two different ways.

Tip vibration: In magnetostrictive ultrasonic devices like Parkell's [Integra](#) or [TurboSENSOR](#), the tip is moved by a vibrating stack of metal strips on the back of the insert. In piezoelectric or simply "piezo" ultrasonic devices like Parkell's [TurboPIEZO](#), the movement is produced by a vibrating stack of ceramic disks in the handpiece.

Tip oscillation: The general consensus has previously been that piezo and magnetostrictive devices differ slightly in the pattern traced by their tips. The premise presented was that magnetostrictive tips trace an elongated ellipse while piezo tips trace a linear back-and-forth pattern. Magnetostrictive advocates claimed that their elliptical motion was more effective because it generated pathogen-destroying cavitation bubbles 360 degrees around the tip. They further claimed that piezo's linear motion created bubbles only at the two ends of their back-and-forth cycle. Piezo advocates countered that their linear oscillation made the piezo design less likely to abrade the tooth.

If there is a difference in tip vibration between piezo and magnetostrictive designs, it's very subtle — and probably without the clinical importance advocates ascribe to it. From Parkell's many years of work designing and manufacturing ultrasonics, we have concluded that the pattern of tip oscillation appears to be influenced far more by the geometry of the tip itself than by the design of the scaler that powers it.

For example, S-shaped tips like left- and right-curving perio tips feature an elliptical vibration, but tips with a simple curve, like Parkell's Universal or Perio tips, vibrate in a linear motion. Independent researchers at the University of Kiel and the Max Planck Institute reported that the vibration pattern of a magnetostrictive scaler seemed virtually identical to that of a piezo scaler, thus confirming our conclusion.

Heat: The metal stack in the magnetostrictive scaler generates heat. To prevent overheating with magnetostrictive tips, you need to scale with plenty of water irrigation. In contrast, the quartz crystal in the piezo scaler doesn't generate much heat, which means you can run the device with much less water irrigation. Because the piezo handpiece generates so little heat, it may not heat the water as it passes to the tip. Patients may therefore exhibit increased sensitivity to the colder water of the piezo scaler. Remember that in neither case should the devices be run dry, as the fluid that flows through the handpiece and out of the tip provides lavage, flushing away debris while cooling the tip. It also provides a vehicle for cavitation

and ultrasonic streaming which play an important part in the cleaning process.

Tips/Inserts: Manufacturers of magnetostrictive scalers would like you to use their inserts in their machines, but virtually all brands of magnetostrictive inserts are interchangeable. Any 25KHz or 30 KHz Parkell insert will work in any other manufacturer's 25KHz or 30 KHz scaler. At the same time, Parkell's scalers accept any other manufacturer's inserts. This means that owners of magnetostrictive scalers aren't married to a single supplier for their inserts.

Most piezo scalers use proprietary tips designed for their specific brand of device. However, Parkell's TurboPIEZO not only works with the Parkell piezo tips but with many of the basic EMS tips as well.

Is there a difference between 30KHz and 25KHz magnetostrictive scalers?

The number of times the scaler tip vibrates each second is called its "frequency." Most magnetostrictive scalers are hard-wired to operate at either 25,000 cycles per second (25KHz) or 30,000 cycles per second (30KHz). Studies have proven conclusively that there's no real difference in calculus-removing ability between the two frequencies. However, 30KHz scaling may be somewhat quieter in the hands of some clinicians, so operators and patients may prefer the higher frequency.

While there may be no difference in scaling ability between 25 KHz and 30KHz units, it is important to remember that a hard-wired 25KHz unit will not work with

30KHz inserts. The reverse is also true. 30KHz scalers will not work with 25KHz inserts.

The best way to eliminate this complication is to buy a scaler that works with both frequencies. Parkell's Integra and TurboSENSOR have the ability to power both 25KHz and 30KHz inserts. This flexibility allows you to use any magnetostrictive insert you currently have in your office, even if you're not sure what it is. When the time comes to replace these older inserts, you will have the peace of mind in knowing that your new scaler can accommodate both 25KHz and 30KHz inserts.

Which Is Better?

Although piezo and magnetostrictive designs each have passionate advocates, both do a fine job of calculus removal and disruption of bacterial plaque. When an independent research association clinically rated every scaler available in the United States, there were piezo and magnetostrictive devices at the top and bottom of the rankings.

What's the moral here? It's not whether a scaler is magnetostrictive or piezo that determines whether it's effective, but rather the design of the entire device, and the competence of the clinician.

What if your scaler breaks down?

Sooner or later, even the best ultrasonic scaler will require service. While many scalers today are manufactured in the Far East, and rebranded for resale by companies in the United States, every Parkell scaler is built at our headquarters in Edgewood, NY. The expert technicians who "put them together" are the same ones who service them. That's why we are able to provide one of the quickest turnaround times in the industry. In fact, 97 percent of all Parkell ultrasonic repairs are on their way back to the owner within 72 hours of arriving at our factory.

So which is best for you?

There is no right or wrong answer to this question. It all comes down to your own personal needs and preferences and the practicality of how easily the scaler will be integrated into your office by the people who will use it. You've got to ask yourself:

- How do the different handpieces feel in your hand?
- Do you have a lot of magnetostrictive inserts from your old scaler that you would like to continue to use?
- Does the concept of scaling with reduced water flow intrigue you?

Answering these questions can help you decide.

We urge you to take advantage of Parkell's 90- DAY TEST DRIVE. Order a Parkell scaler and put it through every reasonable test you can think of for 90 days. If you feel your selection was not what you were looking for, let us know. If the device hasn't been modified or damaged, we will take it back at no cost to you, including even your shipping costs. However, if our scaler has lived up to your expectations, you will have added a device to your practice that's considered by many in the dental community to be one of the best values available.