

# Latest Innovations in Handpieces – Air and Electric By Dr. Michael Miller

The purpose of this article is to give clinicians previews into handpiece innovations along with recommendations on whether any or all of them should be considered when new handpiece purchasing decisions are made.

## **Air-powered handpieces**

Highspeed air turbine handpieces have ruled the North American market for many years and, for the most part, they have performed satisfactorily, even though it is well known that they lose torque when the bur hits the tooth. This power loss experienced by air-powered handpieces has led to the emergence of electric handpieces, which are the standard in Europe and are beginning to take hold in other areas of the world.

But a new type of air-powered handpiece may change some minds when it comes to the superiority of electrics. The Midwest Stylus ATC (Dentsply Professional) looks and feels like the air-powered handpiece you may be using right now, which means its learning curve is essentially flat. But don't be fooled by appearances – the real advantage of the ATC over conventional air-powered handpieces is its coupler and control box. This is where the ATC (Adaptive Torque Control) comes from.

As explained by the manufacturer, a sensor in the coupler tells the control box you are about to cut through, for example, a nonprecious metal coping to remove a crown and you need more power. The control box, which is referred to as an electronic "brain", then increases the air pressure that gives the handpiece the turbo boost necessary to cut through the hard metal. For light cutting tasks, the opposite effect is supposed to occur, i.e., adequate torque at low speeds. In addition, the turbine has been redesigned to handle the higher air pressures.

This all sounds good, but does it perform as advertised? According to a recent evaluation by **REALITY**, the answer is yes, but with a significant qualifier. The **REALITY** evaluation did confirm that the 21 watts of power produced by the ATC doesn't falter when heavy pressure is applied and, while it doesn't possess the unbridled power of an electric, its performance was impressive nonetheless. What's more, all this power is produced by a handpiece that weighs only 3.3oz, which is average for air-powered versions.

So what is the significant qualifier? In a word, it is installation. Since the technology built into this handpiece is cutting edge, the installation process is quite new for most technicians. At least three **REALITY** evaluators noted that the installation was anything but smooth, requiring several repeat visits to get it right. Even then, two evaluators continued to have problems with the handpiece.

Therefore, while the Midwest Stylus ATC is a terrific handpiece and earned 5 Stars from **REALITY**, be absolutely certain that the technician installing it knows what he/she is doing. I also know this from personal experience. When my evaluation unit was installed, the technician was obviously struggling. I called Midwest directly and had their experts guide the technician. The result was that the handpiece worked flawlessly.

## **Electric Handpieces**

As noted previously, electric handpieces are the standard in Europe and are beginning to take hold in other areas of the world. Their tremendous and constant torque allows clinicians to cut

teeth smoothly and reliably. However, electric handpieces have been significantly heavier and larger than their air-powered brethren, not to mention the hefty premium price they typically command.

The COMFORTdrive 200 XDR (KaVo) could be a game-changer for those who have been straddling the fence. The first thing you will notice is the handpiece itself – it looks like a conventional air-powered version since the electric motor has been miniaturized and is built into its backend. This means the handpiece is considerably smaller and lighter, weighing approximately 4.8oz, which is still not in air-powered territory, but does make it the lightest electric handpiece on the market that **REALITY** has tested.

On the other hand, smaller and lighter are not necessarily advantages if performance suffers. But not to worry – this is one powerful handpiece, with the motor stated to produce 30 watts of power. It also allows you to cut at 30,000 to 200,000 rpm. This speed regulation, however, is not via the control box like it is for other electrics, where you can set a specific speed. This also means it can only be used as a highspeed handpiece, whereas other electrics, with interchangeable heads and angles, can be used at high and low speeds.

In other words, to get the small size and weight, you have to be willing to give up some of the benefits of the full-function electrics, including setting a specific speed. Its simplicity, however, allows installation to be uncomplicated – connect it to a handpiece air line and you are ready to roll.

The COMFORTdrive definitely has brought electric motor technology into a different paradigm. If you have held off looking for an electric because of size, weight, and complexity, you should at least add it to your shopping list.

### **Disposable Handpieces**

What happens if your favorite highspeed air turbine handpiece has a maintenance issue or is firmly ensconced in the autoclave when you really need it? You will probably grab for another handpiece that may or may not be in prime working condition. Another option would be to use a brand new handpiece that comes in a sealed and sterile bag and never requires lubrication, cleaning, or autoclaving. That's because the handpiece is disposable – use it once and throw it away.

That's the idea behind the azenic DHP (Azenic). It is being marketed as fast, strong, lightweight, precise, ergonomic, and reliable. Pretty heady claims for a plastic handpiece. And, amazingly, I agree with virtually all of them as long as you keep in mind that this instrument is, indeed, plastic and it is meant to be disposable.

In the first place, it looks like a conventional, air-powered handpiece. And, a pretty cool one at that, with a metallic silver-like ABS molded plastic cladding and a textured finish that keeps it from slipping in your hand even when it's wet. Its dimensions are within normal parameters, but you would be hard pressed to find a handpiece weighing less than the 0.6oz of the DHP. Contrast that with conventional handpieces that typically weigh about 3.3oz and you can appreciate why it feels feather light in your hand.

It attaches to your dental unit's tubing directly – as expected, there is no coupler. The 1-port water spray is adequate and there is a fiber optic rod running through it if you still have an old-style light source at the base of your dental chair and which transmits light through your tubing. But, since the light source of most contemporary handpieces is in the coupler, you will probably not be able to take advantage of its fiber optic potential.

The procedures for inserting and changing burs are also a throwback to a simpler era before the advent of push-button chucks. With the DHP, you insert a bur into the chuck and then apply pressure by pushing the end of the bur against the small concavity on the backend of the violet

plastic cap that you remove from the back of the handpiece before connecting it to your delivery system. To remove the bur, you are told to merely grab it with your fingers and pull it out or you insert the thin metal rod in the aforementioned cap into the hole in the back of the DHP and push the bur out. I found pulling the bur was an exercise in futility, so pushing it out is definitely the method of choice.

I was impressed with its 20 watts of cutting power – it performs better than I expected, especially since it is being promoted as a complement, not a replacement, for conventional handpieces. On the other hand, make sure you don your earplugs – the **REALITY** noise test found it produced 92.6 dBA, which is about 20 dBA higher than most conventional handpieces.

At \$23 each, the cost of these handpieces could add up pretty quickly, so using them judiciously would be a wise move. Nevertheless, for those times when you need a reliable backup or when you perform outreach services, the DHP could be one less item to worry about.

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