

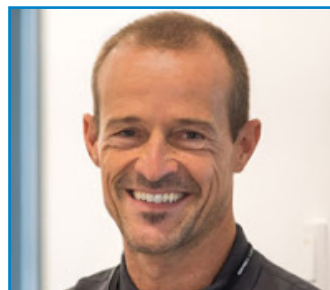
Hygienic Suction

How to reduce aerosol formation



THE HIDDEN DANGER: SPRAY MIST

When it comes to effective intraoral spray mist suction, it is absolutely essential to use a system that provides high volume evacuation in the patient's mouth. This is the only way to effectively avoid formation of aerosols. We hear about this and other important aspects of spray mist suction from registered periodontologist Dr. Dirk Vasel and the Engineering Team at Air Techniques.*



DR. DIRK VASEL

has been a dentist for 28 years and is registered with his own practice in Leinfelden-Echterdingen near Stuttgart in Germany. Specialist in periodontology, DGPARO

Dr. Vasel, it is not just since SARSCOV2 that you and your team in your specialist periodontics practice have been exposed to particularly high levels of aerosols...

VASEL: That is right. For example, the preparation of teeth, removal of fillings, crowns and bridges or the removal of dental plaque require the use of instruments that rotate at high speeds. However, the ease these instruments bring to our work comes with a pay-off in terms of increased risks. This is because effective water cooling is required to prevent damage in the pulp/dentine area. Spray mist is produced in the process, consisting of splashes and droplets that contain, among

other things, cooling water, blood, saliva and microorganisms in particular. If the spray mist is not properly extracted from the mouth of the patient, this will result in the formation of an aerosol. This so-called aerosol cloud can remain for several hours in a closed room if insufficient air exchange is provided.

AIR TECHNIQUES: This is why it is also so important to use an intraoral spray mist suction system that offers not just high negative pressure, but high air flow between 7-10 standard cubic-feet/min (SCFM) in the mouth of the patient. This is the only way to effectively avoid formation of aerosol*.

VASEL: The suction volume does indeed play quite

*Source: Tillner, 2016 & Measurement results from internal study, September 2020, Dürr Dental



Fig. 1: Air Techniques' Mojave V7

a decisive role. It is essential that the suction cannula is large enough. A saliva ejector or a suction cannula with a small diameter would reduce the suction volume – which is precisely what needs to be avoided. And: in order to prevent the formation of aerosol as much as possible, correct handling of the suction cannula is vital. Dental assistants need to learn and practice correct use of the equipment so that they perform suction effectively right on the tooth. This is the only way to ensure that we really do reduce the amount of spray mist as much as we think we are.

What is particularly important here?

AIR TECHNIQUES: It is important that spray mist is primarily extracted in the mouth of the patient so that the formation of aerosol is avoided as much as possible in the first place. After all, if it doesn't leave the mouth of the patient then there is no need to eliminate it afterwards. Using correct suction techniques plays a significant role in reducing the amount of aerosols produced.

Something else that is important in times of Corona-virus: what happens to the extracted mixture of air and liquids?

AIR TECHNIQUES: Each vacuum technology processes the extracted air/water mixture differently. Liquid ring

pumps will often discharge directly to an open floor drain in the mechanical room. This means while the liquid leaves down the drain, the air coming from the operatories can easily permeate throughout the mechanical room and get routed into the air compressor, which can ultimately be directed to other patients. Air/water separator accessories are available to prevent this occurrence but often require venting outside of the building. Dry vacuum technologies typically incorporate a separation tank designed directly into the the vacuum system. The exhaust air should always be directed out of the building if possible. For clinics that do not have the ability to install an external exhaust vent, we recommend using one of our NEW industry first Vent-Less Vacuum Systems which incorporates a medical-grade ULPA filter to safely exhaust into the mechanical room.

What can be done to ensure that these measures actually work effectively?

AIR TECHNIQUES: A vacuum unit check-up is always useful, especially if your vacuum system is over ten year old. Over the years you may see a reduction in the volume flow at the treatment units, e.g. if the practice has expanded without making adjustments to the vacuum unit or plumbing piping size. Also because of inadequate disinfection and cleaning of the vacuum system suction lines. Regular and intensive cleaning and disinfection with Monarch CleanStream are strongly recommended. A specialist service technician or Air Techniques Sales Representative can check the suction volume at each HVE with specialized measuring instruments.



Fig. 2: Air Techniques' Mobile Mojave

Which type of suction system is the industry standard today – wet or dry?

AIR TECHNIQUES: The first dental suction systems were wet vacuums because liquid rings pumps have always been a robust, reliable and cost effective technology. While the initial setup costs for one of these systems may seem low, their water and energy usage make these systems a high cost solution in the long run. The Mojave is a dry system which uses Regenerative Side Channel Blower technology that does not require water to generate suction and utilizes a variable speed motor to slow the unit down when demand is low thereby reducing your total utility bill.

How do you avoid blockages and deposits in the lines?

AIR TECHNIQUES: We are dealing with lots of persistent substances here, such as blood, secretions, tooth material, filling materials and prophylaxis powders. These can form a tough sludge, leading to blockages and a drop in suction performance. We recommend the daily use of CleanStream to make sure that these deposits do not buildup within the plumbing lines. Also, making sure the plumbing lines are properly sized and sloped towards the vacuum.

Alongside an intact central vacuum system, are there other ways to flexibly expand the suction capability of a practice – depending on the



Fig. 3: Air Techniques' new ULPA Filters

conditions and layout of the practice?

AIR TECHNIQUES: Of course, it often happens that a vacuum system cannot be adapted in the short term. And, in some cases, the layout of the building itself may make it difficult to carry out the necessary adjustments. This is why Air Techniques offers the Mobile Mojave, a high-volume product offering mobile spray mist suction with an air-flow rate exceeding 10 SCFM. This system is ready to use straight away and needs nothing more than to be plugged into a wall outlet.



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