

RONDOflex™plus 360

CLINICAL CASE STUDY

Air abrasion system with water spray



RONDOflex™ plus 360

Air abrasion system with water spray to reduce the quantity of powder dispersed and gently and painlessly remove material on a tooth's surface.

Possible applications:

- Minimally invasive cavity preparation
- Preparation of adhesive surfaces prior to mordanting techniques
- Preparation of adhesive surfaces for orthodontic devices
- Preparation for sealing fissures
- Opening fissures
- Removal of adhesive residues in bridges, crowns, etc. (extra-oral)

Product information:

Supplied with 2 cannulas (diameter 0.46 mm or 0.6 mm as well as 2 powder trays and 2 vials of powder (75 g each), easy to connect to the KaVo MULTIflex system, 12-month guarantee.

Class IIa Medical Device (MD) for dental treatment, for health professionals use only, not reimbursed by Social Security. Read the instructions on the leaflet or the label carefully before use. The product described in this flyer is manufactured by Kaltenbach & Voigt GmbH, - Certifying body: 0124 - Date of publication October 2020.

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Current interest of spray air abrasion in dentistry: RONDOflex™ plus 360



Dr Thierry Caire

Dental surgeon | Graduated from Paris Descartes University | Higher studies certificate in Biomaterials | Higher studies certificate in Periodontology | University Implantation Accreditation | Expert aesthetic dentistry member for the Mimesis Group | Independent practice in Lambesc, Provence

Author of publications and communications covering precision in fixed prosthetics, the surgical field in adhesive dentistry, dental photography.

Over the past thirty years, dentistry has evolved from a mechanical process (assembly by fitting) to an adhesive process. Bonding has become the norm in all areas of our work (surgical dentistry, prosthesis, implantation, orthodontics).

Irrespective of the types of materials, the various adhesive systems for bonded assembly always require a clean surface and an appropriate roughness.

The projection of particles, or "micro sanding", has been used for a long time in prosthetics laboratories, mainly to prepare metal surfaces (bonded bridge wings), but also some ceramic materials and resin-based ones, particularly with an adjoining prosthesis. These procedures are performed in sealed enclosures, equipped with powerful decentralised suction due to the risk of inhaling aluminium oxide particles (alumina).

With the development of bonds for indirect restoration (composite or ceramic), performed in CFAO or done conventionally, micro sanding intended for the dental clinic appeared. These work on the same principle as the spraying of aluminium particles by dry air.

This micro sanding is used in a "light" enclosure generally equipped with very basic integrated suction. The working area rapidly becomes dusty.

The use of these powder/air micro sanding particles directly in the mouth (thanks to their unit connection kits) can be problematic due to the cloud of particles present in the patient's and surgeon's environment. In addition, the abrasive alumina dust is found on surfaces and materials. This residue is inevitable, even in the presence of surgical suction.

At the same time, moist "sanding" under the name of aero-abrasion was developed in prophylactic dentistry (prior to sealing of fissures) and as an alternative to drilling in the treatment of early cavity lesions (fissure cavities). If these indications are still variable, their scope of use has been greatly extended today to the treatment of dental surfaces intended for bonding. Currently, two types of material are possible for using this moist sanding technology. Either an independent generator to be installed close to the chair, or a hand piece integrated to the unit via the turbine cord.

We used this integrated material (Rondoflex Plus) fig1 and fig2

It can project either:

- An air/water/alumina mix 27 microns (for light micro sanding on the dentine or the composite)
- An air/water/alumina mix 50 microns enabling more powerful action on metal, ceramic (fracture repair) or the cleaning of temporary elements).

Several studies have shown that micro sanding increases the micro-roughness of a surface (architecture), the wettability of the developed surface and this therefore enables greater adhesion values.



Fig3

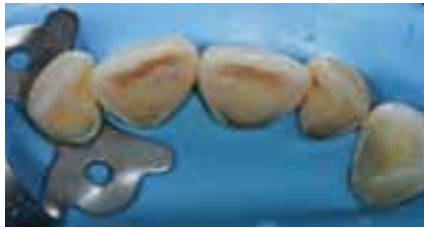


Fig4



Fig5

Fig3; 4; 5 Micro sanding rapidly prepares lingual sides from 12 to 23 before the placing of an adhesive (Optibond eXTRa) then a fluid composite prior to mounting veneers direct in a composite (Harmonize).

ones are treated by mordanting) and micro sanding is done in the mouth on the dental surface which will, ideally, have undergone immediate dentinal sealing with a loaded adhesive, possibly covered with a composite depending on the space available.

From a practical perspective, the micro sanding of the intrados for indirect restoration in composite is done in a prosthesis laboratory (reminder: glass-based ceramic



Fig1



Fig2



Fig6



Fig7



Fig8



Fig9



Fig10



Fig11



Fig14



Fig15



Fig12



Fig13



Fig16



Fig17

fig6 to 13: mordanted Emax overlays (Pierre Andrieu Laboratory). 50u alumina micro sanding of dental surfaces treated before impression with immediate sealing of the dentin (optibond FL + composite flow). Application of a silane on the intrados of the overlays, then Optibond eXTRa on overlays and dental surfaces and finally application of a dual Nexus type glue.

Another advantage of micro sanding is its capacity to remove, in extra oral, residual cement prior to re-sealing and/or re-basing of temporary or worn elements)

Thus, light 27 micron alumina sanding of dental surfaces which have been prepared to receive sealed peripheral elements optimises the tooth/cement/crown assembly, particularly in the presence of low height or significant limitations.

In terms of ergonomics, the conditioning of surfaces by micro sanding (regardless of the type of glue or sealant) is quicker and easier than using brushes, abrasive pastes, drills, burrs or cures.

Fig14 to 17: Cleaning/ of 11 and 21 by 27u alumina sanding prior to sealing of Emax ceramics on zircon mounts.



Fig18

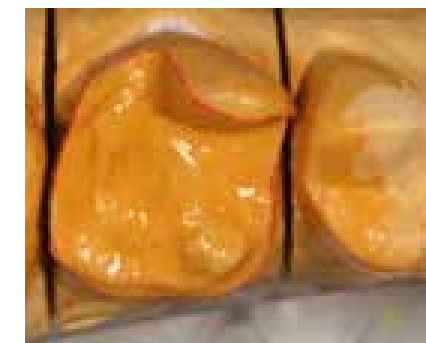


Fig19



Fig20



Fig21

Fig22

Fig23

fig 18 to 23: 27 u alumina sanding of dentinal surface of 16, enamel mordanting, adhesive (optibond Solo plus) assembly by a Dual glue (Nexus). The quality of the joint is excellent.

To conclude, moist air abrasion is a process which is required to achieve perfect adhesion, due to its cleaning power. This micro sanding increases adhesion values by modifying the architecture of the surface of materials and of the tooth.

With the generalisation of adhesive dentistry based on tissue saving, and manufacturing systems for prosthetic elements produced by CFAO, micro sanding has become an essential step in the final assembly process.

Bibliography:

D' Arcangelo and Vanini, "Effect of three surface treatments on the adhesive properties of indirect composite restorations".

Nishigawa et al., "Various effects of sandblasting of dental restorative materials".

Chaiyaburt and Kois, "the effects of tooth preparation cleansing protocols on the bond strength of self-adhesive resin luting cement to contaminated dentin"

Erkut et al., "Effect of different surface-cleaning techniques on the bond strength of composite resin restorations"

Dental excellence at all levels



Clinic equipment

Treatment units and KaVo surgical light, dental chairs, patient communication systems, dental microscope and additional surgical accessories



Instruments

Handpieces and contra-angles, turbines, air-polishers and small equipment for all areas of use including diagnosis, prophylaxis, restoration, surgery, endodontics and instrument maintenance