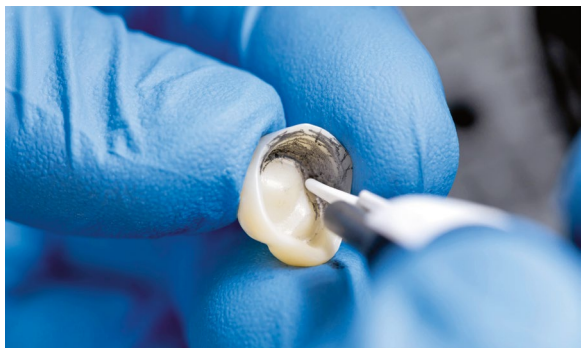
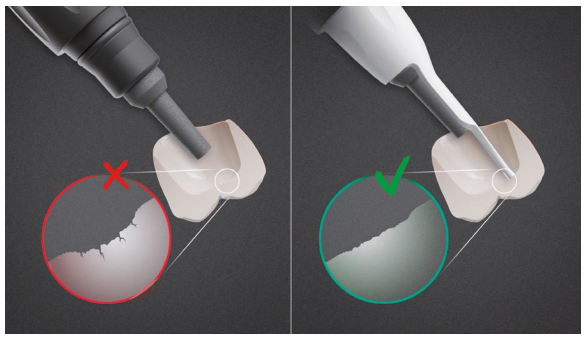
BASIC PREBONDER

FIRST MICROBLASTING DEVICE FOR SURFACE CONDITIONING BEFORE FINAL CEMENTATION

Fig. 1 The Basic prebonder fine-blasting unit by Renfert was developed in collaboration with the Department of Dental Materials Research at the Polyclinic for Dental Prosthetics, LMU University Hospital Munich, to standardize the blasting process as part of clinical surface conditioning prior to definitive cementation.





Figs. 2 and 3: The Prebonder control tip of the fine-blasting unit serves as an integrated spacer, thereby ensuring a constant working distance of 10 mm and controlled energy input.

The long-term success of restoration cementation depends heavily on proper surface preparation. Yet this step remains one of the least controlled in the workflow. Different blasting devices, fluctuating pressure levels, and working "by feel" can result in insufficient micromechanical retention and compromised bonding.

With the Basic prebonder (Fig. 1), Renfert brings process reliability in pre-cementation blasting into focus. This new microblasting device was developed in collaboration with the Department of Dental Materials Science at the Clinic for Prosthodontics at LMU Munich. The goal: to standardize blasting as part of clinical surface conditioning prior to final cementation.

The development focused on the main causes of bonding failure:
- Insufficiently conditioned surfaces
- Excessive energy input during blasting

WHY BLASTING IS NOT ALWAYS THE SAME

"Blast the internal surface of the crown!"— what sounds standardized in theory is full of variables in practice.
This is especially true for zirconia, which contains no glass phase and therefore cannot be etched with hydrofluoric acid. Blasting plays a critical role here.
Targeted blasting:
- Cleans the surface
- Slightly enlarges it
- Improves wettability
- Enhances bonding conditions for primers and resin cements

However, excessive blasting can reduce the material's flexural strength.

Studies show that key parameters such as:
- Particle size
- Pressure
- Distance

significantly influence surface characteristics.

PHYSICAL BACKGROUND

During the blasting process, microscopic aluminum oxide particles impact the surface at high velocity. The „effective energy" per unit area increases as the distance between the nozzle and the object being blasted decreases. This distance determines the energy with which the particles impact and the extent to which the surface is altered. The closer the blasting nozzle is positioned to the surface, the greater the energy input becomes. Consequently, the surface may be excessively roughened or suffer microstructural damage. The Basic prebonder addresses this risk with the „Prebonder control tip," which maintains a constant distance of 10 mm (see Fig. 3). From this, the energy input remains precisely within the validated range.

Recent studies (conducted by the Materials Science Research Unit of the Polyclinic for Dental Prosthetics at LMU Klinikum Munich) have found that the optimal zirconia blasting parameters are:

Pressure: 0.6–1 bar
Abrasive: 50 µm aluminum oxide
Distance: 10 mm
Reducing the nozzle distance by half quadruples the energy input — a physical relationship often overlooked in practice.

CONTROL, NOT GUESSWORK

The Basic prebonder builds on Renfert's proven Basic quattro IS technology but is specifically adapted for clinical use—not a lab device repurposed for practice, but a true clinical specialist.

Key features:
- Precision pressure gauge with fine adjustment
- Validated working range (0.6–1 bar) highlighted in green
- Ergonomic handpiece
- Flexible hose
- Intuitive color guidance system

TWO INNOVATIONS FOR A REPRODUCIBLE PROCESS

Reproducibility depends on controlling:
- Distance
- Beam focus

These are the main sources of error in blasting.

Prebonder Control Tip
- Ensures a constant 10 mm distance (Fig. 2)
- Standardizes energy delivery (Fig. 3)
- Ensures consistent results

Prebonder Jet Nozzle
- Creates a homogeneous impact cone
- Eliminates hotspots and energy loss
- Focuses on controlled surface transformation rather than aggressive material removal

Additionally, an integrated blast indicator enables precise positioning of the blasting steam, thereby protecting sensitive areas like margins and polished surfaces.

BUILT-IN QUALITY ASSURANCE

With the Prebonder control pad, Renfert provides a simple process validation tool.
- Credit-card-sized test surface
- Immediate visual feedback
- Correct settings = visible color removal
- No change = adjust pressure, media flow, or nozzle

BLASTING MEDIA: A COMPLETE SYSTEM SOLUTION

A precision blasting unit is only as good as the abrasive used within it. With Prebonder surface pro (Fig. 4), Renfert supplies the matching aluminum oxide (50 µm, > 99.7% purity) right along with the unit.

Its defined grain distribution, grain geometry, and hardness ensure a consistent surface structure without causing material damage. Packaged in practical 500 g units, the abrasive remains dry and clean, and is ready for use at any time. Furthermore, the modular device concept offers flexibility in daily practice: In addition to the specialized Prebonder tank, the system can be supplemented with standard IS tanks for finer or coarser grit sizes—ideal for cleaning prosthetics or removing cement.

SCIENTIFIC VALIDATION – CLINICAL RELEVANCE

Key Benefits at a Glance:
- Reliable bond strength for zirconia, metal, hybrid, and polymer restorations
- Long-term stable adhesion, even after thermocycling
- Enhanced primer effectiveness through improved wettability
- Gentle conditioning without reducing flexural strength
- Fewer remakes due to reduced retention loss

In practice: fewer variables, more control, better outcomes.

CHECKLIST: IS THE BASIC PREBONDER RIGHT FOR YOUR PRACTICE?

- Do you cement zirconia, metal, hybrid, or polymer restorations?
- Do you want to elevate cementation quality?
- Do you want to systematically prevent bonding failures?
- Do you value reproducible processes over estimation?
- Do you want a scientifically validated workflow?
- Do you need a device that also supports denture cleaning or cement removal?

If yes, the Basic prebonder + Prebonder surface pro offers a complete, validated system solution.

CONCLUSION

With the Basic prebonder, Renfert sets a new standard in clinical surface conditioning. It transforms the blasting process from an inconsistent routine into a scientifically grounded, reproducible, controlled process.
Combined with Prebonder surface pro, it delivers precision with simplicity.

Annett Kieschnick, Independent Specialist Journalist

For more information, visit www.renfert.com or scan the adjacent QR code.

You can find the literature sources for this article via the QR hyperlink code below.

Figs. 1 to 4: © Renfert GmbH

literature sources

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Fig. 4: With Prebonder surface pro, Renfert offers the ideal aluminum oxide. Its defined grain distribution and geometry, as well as its hardness, ensure a consistent surface structure without material damage.