

Top spin Master class precision

At Renfert the integration of customer wishes and requirements is an important aspect before the conception of new products and product improvements.

Before commencing innovation development, the product managers therefore first asked customers: "What is important for you in a pin drilling machine?", "Which requirements and wishes do you have if you purchase a pin drilling machine?"

The answers indicated a clear focus

- Precision during drilling
- Reliable, easy handling during drilling
- Dependability and durability of all components of the drilling machine and drills

In the course of the development it quickly became clear that the requirements influence each other. In order to be able to meet the wishes, Renfert had to give equal emphasis to all the requirements.





Precision during drilling

When dental technicians talk about precision, they are primarily concerned with the optimal fitting relationship of pin head and drill hole:

- ▶ Drilling the hole too large risks the pin loosening at a later stage or not being glued parallel. Too small a drill hole is generally responsible if the pin is tilted or jammed before complete insertion.
- ▶ The differences in precision were particularly noticeable when using pins with a conical head. Minimal inaccuracies already prevented a conical clamping fit. Fixation of the pins is not possible in the majority of cases due to the point contact.

The first step for the solution

Using a new motor and a precision shaft bearing, which is also used in CAD/CAM technology, Renfert was able to successfully give drilling accuracy a new dimension of ≤ 0.01 mm.

To crown the whole subject of precision, Renfert provides three versions of pin drills (small/medium/large) for each drill geometry.

Reliable, easy handling

Drilling accuracy is also affected by manual influences.

- ▶ Even slightly raising or shifting the dental arch when inserting the drill greatly increases the size of the drill hole.
- ▶ Excessive drill resistance can easily result in fracture with delicate dental arches.
- ▶ A lack of positioning management makes it a matter of luck when maintaining the minimum distances with narrow dental arches.

The second step for the solution

Renfert designed the handling so that manual error sizes can be ignored. The uniform drill movement is based on the precise positioning of the telescope guidance. Different machine positions and gripping options

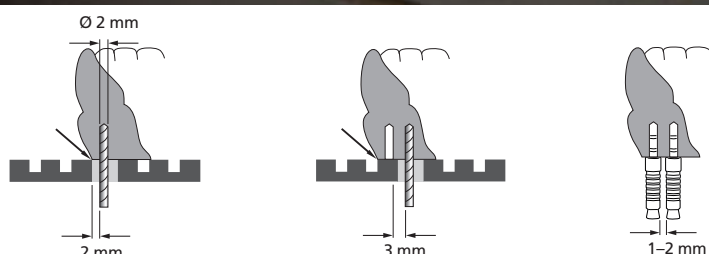
provide the required free space to ensure that Renfert customers can also assume an ergonomic working posture.

The new drill geometry has successfully reduced the force required when inserting into the plaster by up to 50%. Coupled with the light, uniform pressure resistance of the drilling table even dental arches at risk of fracture can be drilled safely.

Specially coordinated marking on the surface of the table and a laser point, which is aligned exactly to the drill tip, enable precise planning of the drill hole positioning. This makes maintaining the minimum distances to the dental arch margin or between two pins very easy, even with narrow dental arches.



Renfert pin drills possess a precision of 0,005 mm.



Dependable and durable

Like all units a pin drilling machine is subject to an ageing process. The special aspect in the case of a pin drilling machine is an environment with corrosive plaster dust. This does not exactly promote the service life. The ageing process essentially becomes noticeable due to the wear parts.

The wear of the pin drills – depending on the frequency of use – is a fixed cost article.

- ▶ Particularly with conventional pin drills the cutting capacity decreases at a very early stage. The greater the cutting capacity decreases, the higher the loading increases for the dental arch, drill, motor and working comfort.
- ▶ There are very different systems on the market for dealing with the plaster dust that occurs. The dust often collects in a critical area for the machine (housing outlet and motor shaft). In addition, cleaning options are often awkward.

The fact is, if the plaster dust manages to penetrate the functional system of the pin drill-

ing machine, then in the ideal case scenario it only results in a loss of drilling accuracy. In the advanced state this frequently leads to failure of the entire machine.

The third step for the solution

With the new drill geometry Renfert was successful in not only reducing the force exerted during insertion into the plaster but also in greatly increasing the service life of the cutting capacity.

Internal tests using a 2 mm stepped drill have shown that the functionality with a good, conventional pin drill is critical after approx. 7,000 drilling sequences (corresponds to approx. 3.5 months with 10 models per day).

After 7,000 drilling sequences the cutting force of the new Renfert drills still has the same performance as that of conventional drills at the beginning of the test.

For Renfert there was only one solution to the subject of aggressive plaster dust. The plaster dust must collect in an area where it

could not do any damage. The falling plaster dust is collected via an inclined plane in an easily removable drawer on the front. The filling level is always visible and the sensitive functional system is always protected.

The new Top spin provides flexibility

The new Top spin was developed as an "open" system. This means that the machine can adapt to a different drill length of a competitor. In particular, drills that are used for drilling into plastic plates often have a considerably longer shank. The required insertion depth can also vary greatly, depending on the system. The infinitely variable drill depth setting of 0 – 20 mm (0 – 0.79 inch) provides a maximum degree of freedom in this case.



Advantages at a glance

The advantages of the new Top spin pin drilling machine are impressive:

- ▶ High-precision drilling
- ▶ Greatly increased service life of the pin drilling machine due to the innovative motor protection with the new dust removal concept
- ▶ Exceptionally high service life of the new pin drills
- ▶ Very good range of services at a very attractive price

Conclusion

Master Dental Technician Oliver Dreher was one of the testers of the new Top spin before it was launched onto the market "When I tested the new Top spin from Renfert I was a little skeptical to begin with, as I am a convinced user of the previous model. The new Top spin has won me over. The drill very easily cuts into the high-strength dental stone of the dental arch. The drilling table can be moved precisely. The precision during drilling is therefore very high. The new pin drilling machine from Renfert is also very stable. Working with this unit is a great pleasure and fully meets all the requirements that I expect from a pin drilling machine."