

DOES DIRT ACCUMULATE DURING MODEL PROCESSING?



We are opposed to dust and noise pollution in the laboratory!

“You cannot make an omelet without breaking eggs,” according to a common saying.

In a figurative sense, this means, wherever work is done, dirt and disorder are generated. This also applies to the dental laboratory.

Dust, splinters, vapors – every dental technician is familiar with the unhealthy “waste products” that are generated during daily work with dental materials like ceramics, plaster, precious metals or plastics.

Fine dust that has small particles that can penetrate deeply into the lungs, are especially dangerous. This makes efficient extraction all the more important.

We have performed tests in our laboratory to find out how much dirt actually accumulates when fabricating a plaster model and to determine the best way to limit dust pollution.

Dental Technician Guido Testa, Busto Arsizio, Italy

Perfect organization and cleanliness have long been of great importance in our laboratory. Therefore, over the

years we have acquired devices and systems that we found to be the most efficient, the most ergonomic and first and foremost, safest.

After all, we work every day with a large number of work materials, technical devices and tools and are exposed to a wide variety of different risks and pollutants – whether during grinding work or when modeling, milling, cutting, soldering or polishing.

Fine dust is a burden on our health.

Again and again the statistics published show that a dental technician's average dust load

amounts to approximately 12 kg per year.

Fine dust is harmful to health and is considered the most common respiratory poison in dental laboratories – for example quartz dust, which is released when removing or blasting investment materials, is carcinogenic.

In addition to this, more and more modern materials are being processed in dental laboratories, such as composite resins, which sometimes contain nano particles which can be released during processing. This can present as a new potential hazard.

Prevention and occupational safety are therefore mandatory for a responsible dental laboratory in a constantly changing working world and should be reviewed regularly.

To find out how much dirt we generate while fabricating models, we performed a simple three-stage test in our laboratory. In the process we also wanted to determine which working method allowed us to limit dust pollution as much as possible.

While scientists in the laboratory very specifically measure the particle concentrations of hazardous substances such as quartz, cobalt, nickel and chromium in $\mu\text{g}/\text{cm}^3$, we wanted to find out in a simple way how far the dust particles in our workplace actually scatter and the best way to extract them.

Three models, three attempts, a convincing result.

For the “dirt test”, we first poured three Class IV plaster models from a single impression and then prepared them for pinning. The figures show the milling machines, the models, the three systems used and a tape measure which we used to measure the dirt that is generated during the plaster processing. The work area was cleaned thoroughly after each grinding.

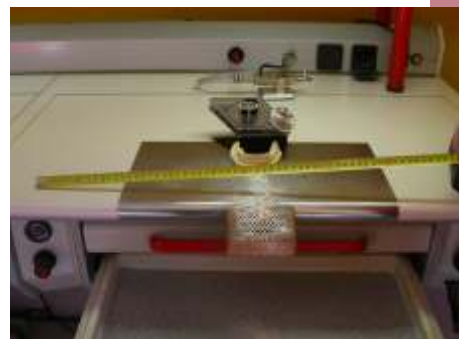
1st test – without extraction



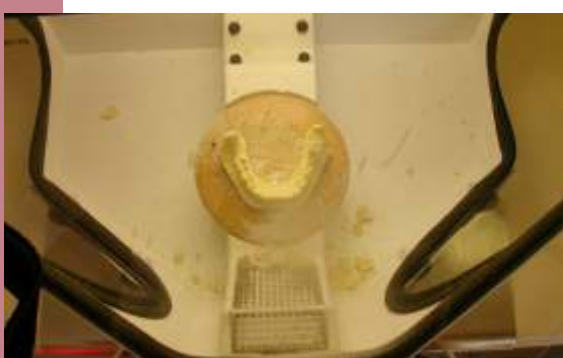
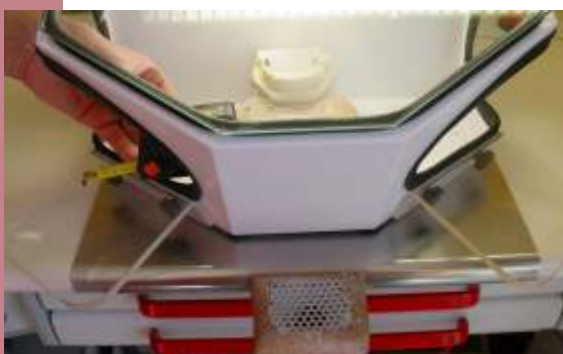
First, we prepared the model without extraction. The tape measure showed that the plaster remains can be found at a distance of up to 51 cm.

2nd test – with extraction hood

The second plaster model was prepared with the *SILENT TS* extraction unit by Renfert and the extraction hood. Here, the dust radius was reduced to 36 cm.



3rd test – with *SILENT TS* and dust extractor box



Finally, we processed the third model with the *SILENT TS* extraction unit and the *Dustex master plus* extractor box. The most convincing measurement result that showed the plaster dust stopped after only 5 cm.

Below are a few more comments on the *Dustex master plus* by Renfert

The tip-proof and slip-proof suction box has given us more room in our laboratory, because we were able to replace the original 120 cm plaster extraction table with one that is exactly half as wide.

Additionally, the applications are extremely multifaceted. The box protects both against dust and vapors and also against splinters and we could use it in our laboratory not only for work on plaster models but also to produce and process individual impression trays and total prostheses, for repairs, relining and for any work that generates dust.

As a result, the degree of pollution and the associated health risk have been significantly reduced for all these tasks.

Less dust and noise – better health protection!!

Our Conclusion


Although we have focused on only one marginal parameter of model processing in the laboratory with the “dirt test”, the results have clearly shown how useful and important a modern extraction system is for preventing harmful exposure to dust.

While we cannot prevent the release of ultra-fine particles due to the mechanical processing of dental materials in the laboratory, we can prevent this from becoming a danger to us.

And when the extraction system works as quietly and smoothly as the *SILENT TS* device, we have also protected our hearing at the same time.

With all the noise we are exposed to in the workplace every day, we are thankful for any noise generation that is prevented.

Progressing technology and the development of new, ever more refined substances in dental medicine and dental technology makes adhering to preventive measures and defined limit values all the more important for everyone involved.

Renfert's efficient extraction system and compact extractor box guarantee us less dust and noise pollution in daily laboratory work and, as a result, better safety and health protection for all employees. 



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