



The Dent-Liner

A Bulletin Dealing With Issues For Dental Health Professionals

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Improving Model and Die Preparation

The Crown and Bridge model is the foundation for a superior prosthesis which needs to be constructed with the utmost care and attention to detail. Loss of marginal integrity or compromised adjacent teeth are not acceptable in the dental profession. In the laboratory, we use various types of

die materials such as stone, amalgam, polyurethane, epoxy and refractory materials for ceramics. Dental stone including die stone is ADA classified into five categories. Of these categories, Type IV and V gypsums reproduce fine surface reproduction. The physical properties of these types are improved over those of dental stone and plaster because less water is needed to obtain a sufficiently fluid mix (thixo-tropic).

Improved properties were obtained through the incorporation of gum arabic calcium hydroxide or resin. The stone

used for the material should have a minimum setting time and low thermal expansion, maximum smoothness and surface hardness.

On the other hand polyurethane or epoxy resins could be used on silicone based or polyether impression materials. These resin dies have a high abrasion resistance and high compressive strength over die stones. Resin dies are recommended for the fabrication of all ceramic restorations. The main drawback of these epoxy dies is polymerization shrinkage which appears as a tight fitting restoration due to the undersized die. Polyurethane such as Bredent's *Exakto-Form*, however has a linear shrinkage factor of less than .17% and is more accurate and durable than epoxies.

New formulations of polyurethane resins solve this problem by minimizing polymerization shrinkage. There are requirements of die materials that are necessary for superior models. They require high mechanical strength properties to withstand handling without being fractured or destroyed. A tough surface hardness to resist scratching and abrasion while the wax or resin pattern is being fabricated and compatibility with the impression material is also essential.

There should be a good colour contrast with the other materials so that the prepared margins can be easily detected. It should be compatible with the separating medium used such as Bredent's *Isobre* (54001040). It should



The Giflex-TR, Ø 37 mm (34000020) has multiple holes which become transparent, allowing easy viewing of the cut line.

also have high stability, dimensional accuracy and easy wettability with the waxes used or compatible with UV or traditional modeling resins.

There are many basic requirements for good working models. They must be free of bubbles, especially along the finish lines (margins) of the finished preparation. All portions of the model must be free of distortions and the dies must be trimmed to ensure access for carving purposes.

Dies must also return to their exact original position and remain stable, even when inverted. The model containing the dies must be easy to mount on the articulator. When the impression arrives at the lab, it should be washed under cold running water in order to remove mucous and saliva.

The impression must also be disinfected according to the impression material's specifications and to the standards of practice. Then follow the manufacturer's instructions for the correct water/powder ratio which may affect many of the properties of the set stone, including

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Renfert's New basic Series of Sandblaster Units!



The Renfert product designers gave the family of new basic sandblasters a whole new modern look while taking into consideration that the range of blasters still remain true to the original design. The new series of sandblasters have many integrated ideas and techniques designed to enhance the sandblaster and provide the best possible view of the working area while the restoration is being deusted.

Renfert has additionally developed an innovative LED technology called the "Perfect View" which achieves the perfect balance between *diffuse* and *direct* light, by increasing the spectrum of light available to the human eye. The layout of the new LED lights and the way that their light is distributed from various different diffusers simultaneously produces two contrasting advantages.

The scientific difference between the two types of lighting is that the more diffuse the light, the less shadows are produced

and the more direct the light, the more unevenly the areas are illuminated.

The "Perfect View" concept provides the ideal arrangement with an optical lighting condition with 4800 LAX, which meters the amount of light visible to the human eye. By incorporating LED's that replicate day light a wider spectrum is achieved, thus there is more to see. The more wave lengths which are reflected or absorbed, the stronger the contrasts on the illuminated object so that the dental technologist is able to see much more during the sandblasting process. Since, the human eye is most familiar with natural daylight it makes operating the basic series of sandblasters even more precise and more comfortable.

Within the new basic sandblasting chambers, there is no unnecessary air or sand turbulence between the casting and viewing window because of the *strategically positioned ventilation slits* providing the operator with a clear view through the window.

The above average service life and the clear view are due to the *silicone coated screen*. Even with a good ventilation system, certain amount of sand always lands on the glass window and causes abrasion. Renfert has addressed this issue of protecting the glass using a well proven method where the *transparent glass is coated with elastic silicone* which causes the grains of sand to simply bounce off and cause less damage. This process keeps the glass clear for a considerably longer time. The *protective glass flap* on

all the new basic sandblasters can be comfortably placed within the blasting unit, which allows a perfect view into every corner of the blasting chamber. The blasting hoses are positioned so well throughout the chamber that the view into the chamber remains unhindered during sandblasting.

Other new functions include upgrading the tanks as in the basic quattro. Now there is no longer a difference between the left and right hand tanks. The colour coded hose and the installation is so intuitive to install that every dental professional will be able to upgrade the tanks themselves in less time and without the use of tools.

The top of the line unit, the *Basic Quattro IS* has been given a special function without any increase in costs compared to the original model. The new *Quattro-IS* will be able to adjust the pressure individually in each of the four different tanks since there is a *pressure gauge incorporated into every tank lid*.

One example of the advantage of this function is the use of Rocatec™, which requires a specific and constant pressure setting. With this function, it is possible to set this prerequisite permanently in one operational step. The basic sandblasting series are exclusively recommended by 3M Espe for use with their products.

For further information and pricing on these exciting new Renfert Basic sandblasters contact us today at 1-800-250-5111 or email us at info@dent-line.com.

Product Show Case

Bredent's New VisioSil: *an excellent silicone matrix material.*

VisioSil is a dual mixed transparent silicone which automatically mixes in conjunction with a dispensing device. The 100% clear transparency and modeling characteristics allows simplicity in clinical and laboratory procedures. The silicone matrix material allows effective light curing of composite materials throughout the transparent matrix. VisioSil is quick and effective in fabricating temporary provisionals and curing composites in an anaerobic atmosphere eliminates the dispersion layer and results in a denser smoother surface. The material can also be used as an accurate bite registration since its clear nature allows better visual procedures. VisioSil can quickly replicate any original crown form in either wax, acrylic, porcelain or other modeling materials. The material has a high tear strength, extreme durability, and predictable results. VisioSil is more efficient than traditional procedures such as using putty, alginate and formed matrices. In orthodontics, light curing indirect bonding can be achieved because VisioSil does not flow under orthodontic bracket pads, but still captures the brackets enough for precise positioning. It come off in one piece and does not get stuck behind the tie wings or in the slots. For further information contact Dent-Line of Canada Inc. at 1-800-250-5111.

VisioSil



Order Number 54001200

Improving Model and Die Preparation



Bredent carbide (H194SH70) provides a smooth surface for the pinned arch which creates a clean model base.



The extra coarse cutting design of Bredent's carbide (H274SH40) ensures fast removal, while producing a smooth surface.



This Bredent carbide (H263GH30) is ideal for the simultaneous removal of stone while exposing the margin.

Bredent provides high level products to help improve accuracy and working time while preparing model and die preparation - especially essential in the case of high precision attachments and implant work!

setting time, porosity, setting expansion and ultimate strength.

In the case of Bredent's *Exakto-Form* polyurethane material, which is available in ivory, light grey, yellow, dark blue or olive green, the selected shade for components A and B is mixed by hand. The stone is also mixed by hand to incorporate powder and liquid, then transferred to a vacuum vester, such as Renfert's series of *Twisters* to remove the bubbles. Rubber based impressions should be completely dry, the surface should be free of visible water, but should still be shiny; if the surface appears dull, it has been over dried and some distortion may occur.

Polyurethane can be poured into the impression, only after it has been sprayed with Bredent's silicone spray. Using a small instrument, such as Bredent's *Transfuser* (390S0001), to carry the stone or polyurethane to the impression of the prepared tooth. Place a small amount of material on the side of the impression above the preparation and vibrate until the stone reaches the occlusal surfaces of the preparation.

Fill the impression so that the material flows slowly across the bottom of the preparation to bulk up for an adequate portion for the construction of the die. Add small increments of materials to the distal end of the impression so that the material will move mesially, flowing from tooth to tooth and filling them from the

bottom. Add more material and vibrate until all the teeth in the arch are filled. Once the material is set, locate the preparations and drill holes into the arch. Glue the pins (*Bredent's Master-Pins*) into the arch. Separate the pinned arch with Bredent's *MasterSep* (52000290) and pour a base inserting the arch into the mould containing the magnet. Trim and mount the models to the bite registration on the articulator. The magnet will hold the model in place. The dies are separated with Bredent's *Giflex* cutting discs, which are faster and more precise than separating with a hand saw.

The dies are removed, then using Bredent carbides; start removing the stone around the finish line. This process is known as ditching the die and it defines the position of the margin an acts as a guide to the gingival contour when the restoration is being waxed. This can be accomplished using Bredent's *Rapidly micobur* (H001NH31). The shape is perfectly suitable for exposing the marginal border without break-offs from the die.

There are a number of different types of margins that can be used for crown preparation. There is the *chamfer* which is popular with full gold restorations, which removes the least amount of tooth structure. There is also the *shoulder* which allows for thickness of material such as in the case of porcelain fused to metal or when restoring with all ceramic



The round carbide (H001NH31) is perfectly suited for exposing the margin border without chipping.



Litebloc UV (52000980) allows fast build-ups and solid curing and can be trimmed by carbides.



Bredent diespacers produce 8µm to 10 µm. Multiple layers provide the required thickness.

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NOTE: The publication of pictures from "Improving Model & Die Preparation" were provided courtesy of Bredent GmbH.

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crowns. Also by adding a bevel, the **shoulder bevel** margin effectively allows for a better seating and sealing crown. After the die has been ditched, the finish line should be high-lighted with a sharp red coloured pencil. This aids to positively identify the margin when waxing the crown. Blocking out undercuts can be done using special waxes or Bredent's **Lite-Bloc UV** (52000980). Undercuts need to be removed, otherwise the wax pattern cannot be easily removed.

Hardening is necessary with die stone materials because it seals and adds strength to the marginal area to help prevent chipping. Bredent's **Transparent UV die spacer** (54001006) can be used with less than 10µm per layer of hardener.

Die spacer is needed to provide space for the cement and is suggested at 20µm to 40µm per layer; space must be provided, otherwise the restoration will not seat properly.

Each dentist and dental laboratory have their own standard thickness within this specific range. Bredent **die spacers** are available in **silver** (54000717), **gold** (55000005) or **blue** (55000007) and provide a range of between 8µm and 10µm. Multiple layers of die spacer can be applied to gain the required thickness, and once dried

sufficiently, waxing up of the patterns can begin. Die isolation can be achieved with **Isobre Wax Insulating Liquid** (54001040). Once the sawn and sealed master model has been approved for accuracy, only then should the wax patterns be fabricated by the dental technologist. This manner of precise model preparation is the source for the most accurate of crown and bridge restorations.

There are three types of crowns that may be prescribed for certain individuals. This includes metal, all ceramic or

porcelain fused to metal crowns. Modern materials make these crowns or bridges strong, durable and ideal for providing support to the posterior teeth for full occlusal function. The dental health professional team will thoroughly select the type of crown or bridge in order to provide positive outcomes that improve aesthetics and functionality for the patient.

Source; Peter T. Pontsa, RDT

* References are available upon request.

Announcements: SonicBrite™ compatible with VKS

SonicBrite™ is a recommended sonic bath denture cleaning system that is particularly safe for Bredent VKS attachments. Clinical observations of partial dentures and overdentures equipped with Bredent VKS attachments showed no adverse conditions or deterioration of the female retentive inserts. There was no problematic damage and no evident loss of tension. In conclusion, it is apparent to us at Dent-line of Canada Inc. that the SonicBrite™ Cleaning System is safe to use with the Bredent VKS Attachment system.

Sincerely,



Peter T. Pontsa, RDT
President,
Dent-Line of Canada Inc.



SonicBrite™ Ultrasonic Bath Cleaner effectively cleans all sorts of dental appliances; orthodontic appliances, nightguards, mouthguards and partial dentures! The SonicBrite bath's ultrasonic waves creates a cavitation process which when used in combination with the SonicBrite cleaner effectively kills 99.9% of odour producing bacteria!

Call today at 1-800-250-5111 so your patients can experience a whole new level of clean!

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Trade Show News and Announcements

Please join us for the **Toronto Academy of Dentistry 74th Annual Winter Clinic** on Friday November 4th, 2011, at the Metro Convention Centre. The Winter Clinic is the largest one day dental convention in North America where dental health professionals come to learn from world class speakers. It is also a great opportunity to explore and save on products and services. This year's clinical program covers a

broad spectrum of topics that will be of great interest to the profession. Join us at our booth to see the new **SonicBrite™**, ultrasonic cleaning system that helps kill bacteria and removes stains and odours effectively. In just 15 minutes daily, it cleans dentures, mouth guards, sleep apnea appliances and ortho splints. See us for a demonstration during the convention!