What comes to mind first if you hear the word „shrinkage“? Perhaps it’s the shrinkage of the ice areas in the mountains, Arctic and Antarctic regions due to the global climate change? Global oil and fresh water reserves are shrinking as well as the human body when it gets older. In all these cases, shrinkage is a challenge to overcome, like with composite resins in dentistry. But shrinkage can also have some very positive aspects:

Grapes are shrinking when becoming raisins; their sweetness is increasing during this process. The dinosaurs died out, because smaller and faster species could better adapt to the changing environments. Computers have shrunk a lot over time, continuously increasing their performance. Micro technologies made minimal invasive surgery possible and Nanotechnology changed the world of dental materials. However, in this edition of the Espertise Magazine we are exploring deeper into the world of shrinkage, small particles and high performance. We want to highlight some challenges and solutions within, but also outside the dental world.

Enjoy reading!

Gerhard Kultermann, Editor
3M ESPE, Seefeld, Germany

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Precision is a fundamental prerequisite for the fabrication of successful CAD/CAM zirconia restorations. Yet the number of finely choreographed steps required and the amount of technical expertise needed to achieve this precision are often underestimated. Comparisons of different systems often neglect the fact that dentists and dental technicians provide unique objects that exhibit pronounced differences in geometry and thus pose varying requirements.

Yet it must be possible to achieve this level of precision under the conditions that prevail in dental surgeries and laboratories – and not only under ideal conditions, which are rarely seen in real life. Successful CAD/CAM systems must therefore be able to control inherent material properties such as ceramic shrinkage so the desired result is attained.

The first shrinkage occurs during the ceramic blank manufacturing process. At this stage, precision is determined primarily by the homogeneity of the green body. A green body is essentially a conglomerate of densified (condensed) powder particles with a porosity of approximately 40%–50%. They can be produced by axial or by isostatic compression. Axial compression densifies the powder by means of a male and a female punch, whereas isostatic compression densifies the powder three-dimensionally in an oil bath into which the powder is placed inside an appropriately shaped rubber matrix.

Subsequent moderate tempering, the so-called pre-sintering step, makes the powder particles fuse at their points of contact, giving the green body its specific strength and allowing it to be machined without fracturing. The following main sintering step at temperatures of up to 1500°C results in complete densification of the blank, eliminating porosities and reducing its volume by consolidating and rearranging material via particle surfaces or the gas phase.
Thermodynamics constitutes the driving force of this process, as all systems have the natural propensity to evolve to the lowest possible state of energy. This state is reached by reducing the contact area between the particles and the atmosphere (i.e. by reducing the absolute surface). The ideal state, from the point of view of physics, would thus be a spherical monocrystal.

In industrial applications, the green body will shrink during sintering with one, two or three different shrinkage factors for the three spatial dimensions, depending on the pressing method. The shrinkage coefficient is the amount (in percent) by which the sintering process causes the green body to shrink in a given spatial dimension, relative to its baseline size. This value corresponds to the correction factor by which a framework designed on-screen using CAD (computer-aided design) will be expanded in order to yield the correct dimensions for milling.

It is therefore important when producing a green body to ensure, to the utmost extent possible, the exact reproducibility of these shrinkage coefficients for every single blank. Because 3M ESPE makes its own blanks for the Lava system, the company has fully mastered this key area of expertise. The colouring of the Lava frameworks does not have a negative impact on shrinkage and, hence, does not adversely affect precision.

Other important factors regarding dental objects to be sintered are the sintering technique and the storage conditions. During the sintering process, the objects, which are milled to enlarged size, must be stored with a minimum of friction to allow free contraction in all three dimensions. Even minute amounts of friction may result in variations that will exert a significant influence on the fit of the restoration. 3M ESPE has developed special procedures to keep friction down, where restorations are mounted on specially shaped wires or holding pins.

The above makes it amply clear that a frequently voiced assumption, namely that a scanner with a certain precision, however defined, is sufficient because the systems are “all the same anyway” and “open” interfaces are therefore no problem, is not corroborated by practical experience. Precision is the result of the interaction of all the parameters described, not just a function of a single parameter. A well-coordinated interface adapted to all of the parameters mentioned is eminently important.

Obviously, much effort and a lot of specific expertise in ceramics engineering are required to make even partial progress toward precisely fitting zirconia restorations.

In the future, CAD/CAM production and zirconia will offer the best prerequisites for economic success – on the part of dental laboratories and dentists alike. Those who do not wish to invest in this costly technology themselves can still benefit from it by using the services of milling centres, which give clinicians and technicians access to state-of-the-art dental restoration without the risk associated with major capital investments and without the operating costs. The solution is to simply outsource the frameworks!

Daily CAD/CAM practice requires a design that meets both functional and aesthetic demands, that offer superior aesthetics based on pre-coloured frameworks and that, moreover, exhibit a precision of fit that allows dentists to insert the restorations quickly, with only minimal adjustments required on the part of the dental laboratory.
Periodontitis is interpreted as a multifactorial infectious disease associated with biofilm (plaque) [12]. The disintegration of supragingival and subgingival plaque combined with accessory antibiotic treatment plus the modification of risk factors have been central to non-surgical periodontitis therapy [17]. Mechanical debridement is primarily aimed at reducing the count of periodontally pathogenic microorganisms in periodontal pockets. In general, either hand instruments or motor-driven instruments can be used for this purpose. Studies of the clinical efficacy of sonic and ultrasonic scalers have shown that both methods yield equivalent results in non-surgical periodontitis therapy [1, 3, 7]. Excessive cement removal, as recommended earlier, is no longer attempted today, because it was shown that endotoxins – especially those secreted by gram-negative bacteria – penetrate only the superficial layers of the cement [11]. Furthermore, air/powder/water polishing units using a low-abrasion polishing powder based on glycine (Clinpro™ Prophy Powder, 3M ESPE) have proven successful in periodontal maintenance and as adjuncts to non-surgical periodontitis therapy, achieving the decomposition of subgingival plaque in pockets up to 5 mm probing depth [13].

At the time of re-evaluation, four to six weeks after subgingival debridement, a clinical reduction in the gingival signs of inflammation such as reddening, swelling, suppuration and bleeding on probing was noted. Depending on the baseline severity, reductions in pocket depths may also be observed [8, 15] that result from a combination of periodontal recession and clinical attachment gain [1]. Increased resistance of the tissue, now taut and free of inflammation, reduces penetration by the periodontal probe and ultimately results in a measurable clinical attachment gain [14]. In the presence of moderate probing depths of 4 to 6 mm, an attachment gain of approximately 0.5 mm and a mean reduction in probing depth of approximately 1 mm can be seen. Deep periodontal pockets of more than 6 mm can be reduced by approximately 2 mm, with attachment gains of approximately 1 mm [2]. By contrast, subgingival instrumentation of the root surfaces of teeth with primary low probing depths of 1 to 3 mm will result in attachment loss [1, 2]. Long-term studies have shown that the clinical results of non-surgical periodontitis therapy can be stabilized with recall sessions at three- to four-month intervals [1, 4, 9].

Clinical Results

Shrinkage

Clinical and histological „shrinkage“ after subgingival debridement

Tim Joda, Münster, Germany

Figure 1: Initial pocket probing depth of 6 mm on tooth 12 in a 43-year-old male patient with chronic periodontitis (A). Subgingival debridement using a Gracey curette (B), sonic scalers (C) and an air/powder/water polishing unit (D). Pronounced periodontal recession distally of tooth 12 four weeks after initial therapy (E).
Histologically, a long junctional epithelium will develop on the root surface previously covered with calculus and plaque as early as two weeks after subgingival debridement. The so-called epithelial attachment is connected to the tooth surface via hemidesmosomes [16]. Periodontal regeneration – in terms of restored alveolar bone, root cement and periodontal ligament – occurs only very rarely. In general, histological wound healing after subgingival debridement has the character of a repair process [10, 16].

From the point of view of the periodontally compromised patient, the shrinkage of the periodontal tissue following non-surgical periodontitis therapy is often perceived as an aesthetic and functional impairment and associated with increased thermal sensitivity. Periodontal recession and the loss of the papillae result in interproximal “black triangles”. Given the new gingival morphology, the patient’s interdental hygiene must be adapted individually to include the use of floss or interdental brushes, depending on the size of the respective interdental spaces. Especially in the maxillary anterior region, direct composite restorations in a special matrix technique [5] or gingival epiteses [6] may mask the loss of hard and soft tissue, eliminate phonetic problems and ensure an aesthetically acceptable result.

**Figure 2:** Periodontal recession with loss of papillae following subgingival debridement in a 25-year-old female patient with aggressive periodontitis (A). After aesthetic widening of teeth 11, 12, 13 with composite (B). Functional and aesthetic rehabilitation with a harmonious and well-balanced smile line (C).

**Figure 3:** Pronounced hard and soft tissue loss in the maxillary anterior region in an 85-year-old male patient with chronic periodontitis (A). The patient’s epitesis (B). Gingival epitesis in place, eliminating the interdental “black triangles” and restoring aesthetics (C).

*Detailed references available through your local 3M ESPE Dental Products office.*
Open up and you don’t shrink

Oliver Kappler, 3M ESPE, Seefeld, Germany

Composite materials have been used in dental practices to restore teeth since the pioneering work of R. L. Bowen and the introduction of composites to the dental market by 3M in the early sixties. Significant improvements have been made since then. Composites are an essential part of today’s dentistry due to their versatile clinical use and phenomenal aesthetics that allow for the creation of virtually invisible restorations.

Methacrylate-based composites show a volume contraction as they cure which is often referred to as polymerization shrinkage. It is striking, that until now polymerization shrinkage was only incrementally reduced to a somewhat lower level and remained one of the major drawbacks of composite materials. During restorative procedures composites are bonded to the cavity wall which prevents them from shrinking. As a consequence tension builds up which challenges the tooth/composite interface. This shrinkage stress leads to microleakage which is among the major factors for composite material failures in the oral environment. Moreover, shrinkage stress can lead to tooth deformation, enamel cracks and stress-induced post-operative sensitivity.

More than ten years of research and development and a fundamentally new chemical concept build the basis for a milestone innovation in composite restorations. Filtek Silorane Low Shrink Posterior System has a ring-opening chemistry and is the first direct restorative with less than 1% shrinkage.

1 volumetric shrinkage tested by bonded disc method

Fig. 1: Clinical symptoms associated with volumetric shrinkage, polymerization stress and marginal gaps.

Materials which remain dimensionally stable on polymerization, coupled with an advanced bonding to the enamel and dentin, will markedly enhance the stability of the restoration.

Historically, the main strategy to reduce shrinkage in methacrylate-based composites focused on increasing the filler load. Filler improvement has reached a very sophisticated state with the incorporation of nanotechnology in Filtek™ Supreme XT. However, shrinkage remains an intrinsic property of the methacrylate resin matrix. Therefore, exchanging the resin seems the most promising pathway to solve the shrinkage problem.
Filtek Silorane Posterior Restorative is designed to minimize shrinkage and polymerization stress.

With Filtek Silorane Low Shrink Posterior Restorative, 3M ESPE advances beyond the current methacrylate resin systems.

Filtek™ Silorane resin is based on Silorane chemistry and does not contain any methacrylates. These ring-opening monomers provide for low polymerization shrinkage <1%. The Silorane technology therefore provides a fundamental solution to the long-standing customer need for low shrinkage and minimal stress.

The Filtek Silorane technology also offers advantages when handling the material in the dental operatory. Filtek Silorane shows non-stick qualities and holds its shape for comfortable shaping of contact points and cusps. Due to the cationically initiated ring-opening polymerization, Filtek Silorane provides the clinician with up to nine minutes of stability – under full operatory light – to allow restorations of any size to be shaped and moulded before being cured as usual with a modern LED lamp for 20 seconds.

Excellent marginal integrity is achieved in combination with Filtek Silorane’s dedicated adhesive system. The Silorane System Adhesive consists of a self-etch primer and a bond especially developed to optimally link the Filtek Silorane Restorative to the tooth.

Filtek Silorane has been tested extensively for safety and efficacy both in-vitro and in-vivo in more than 40 scientific studies which impressively show the solid foundation this milestone in restorative dentistry is built on.
Healthy shrinkage of the dental surgery

In this day and age, the concept of shrinkage in all its varieties has simply become part of life. Therefore, in the context of dental office management, it is also highly rated. The business environment in the dental sector has strongly deteriorated and dentists are evermore faced with a brisk competition. The aim of dental office management is therefore to shrink the costs rather than the profits.

Process optimization: Seeking problems and solutions

In order to achieve satisfactory results, there are a number of measures to support the healthy shrinkage of the dental office. Basically, a thorough process optimization should be at the center of attention. Thereby it is firstly necessary to identify existing problems and to define the measures to take in order to solve them. By eliminating unnecessary process steps, procedures will be simplified and shortened. The next stage should be the standardization of processes in order to optimize the performance of the dental surgery by avoiding mistakes and making the applied methods more assessable.

Outsourcing: Sharing the workload for more profitability

The rising number of employees in dental surgeries with an affiliated laboratory proves that more and more dentists are intent on maintaining as many procedures as possible in-house. Nevertheless, this requires large investments which naturally have an effect on the financial situation of the dental surgery. The solution is to outsource parts of the production. Here, the Lava™ CAD/CAM system which enables the manufacture of high-quality all-ceramic zirconia restorations sets a good example. Instead of purchasing the technology and thereby rapidly increasing the fixed costs, the dentist is able to pass on his work to Lava laboratories and Lava milling centers.

Material management and rapidity: the keys to efficiency

An effective material management can help to shrink the costs of the dental office. As a solution, by concentrating only on one product portfolio which is well-matched and covers all indications. The product portfolio PTC+ (Professional Tooth Cleaning Plus), as part of the advanced systematic concept for professional tooth cleaning, Comfortable Oral Care is one example of a well-matched, high-quality product range. Apart from a thorough and gentle professional tooth cleaning, the PTC+ products enable an especially fast treatment and the saving of application steps. This is a decisive advantage for the dentist, because they are able to treat more patients in the same amount of time. Since, consequently, rapidity is also a factor of success, the dental office team should concentrate on shortening the duration of treatment.

Software for the dental surgery: all at a glance with one click

The digitalization of the dental surgery through an efficient management system to support the dentist and his team is another step to successful process optimization. As an example, it enables record keeping and patient scheduling with digital file cards, even including the assignment of correspondence, of digital x-rays or pictures taken with an intraoral camera. Apart from saving time, this networking enables a better overview and more control of costs.

Conclusion

All in all, the healthy shrinkage of the dental surgery can be achieved by simply, but systematically optimizing all procedures. Consequently carried out, in many cases healthy shrinkage is the last chance to cheat the gallows.
Over centuries cork has proven its worth in sealing wine bottles. The ancient Greek already used it to seal their amphoras. The revolutionary boom in the 19th century also demonstrates that cork is a durable and reliable material for sealing wine and champagne bottles. Back then, cork was considered the ideal solution. But today, this way of sealing bottles seems to be out-dated. Not only the upcoming shortage of raw materials, but especially the much feared cork taint have been complicating the winegrowers’ work for decades. It was inevitable coming up with a new idea for bottle sealing systems, which adapt to the altering conditions and balance the shortcomings. The innovative solution is called glass: It is sterile, seals perfectly and most of all it does not lead to the musty odour which year by year causes the winegrowers to lose billions. The innovative glass design has been convincing in its functionality and its elegant appearance since 2004. A plastic PVDC joint provides the glass stopper with a safe hold in the bottle neck. It is additionally fixed by an aluminium cap.

**The discarded oldie**

The traditional way of manufacturing the seal from cork oaks is losing more and more relevance and, on the long run, will remain just a nostalgic and out-dated variety of the bottle cap. The cork does not only face difficulties in production, but also causes a cork taint in at least five percent of all cork-sealed wines. The production of cork is a process of years. The bark of the cork oaks, which only thrive and prosper in a Mediterranean climate, can be harvested for the first time after 25 years of growing, and from then on every ten years. It is a complex procedure which does not even grant success, since the bitter taste of trichloroanisole that the winegrowers are so powerless against makes many vintage wines undrinkable.

**A glassy affair**

Not exactly a new material, but with a new place of installation, glass is the aspirant for a modern type of bottle seal. The high-class invention has already received the “Columbus Egg”-Award of the Innovation Foundation in Bochum (Germany). The glass stopper does not only have a noble design, but is also practical. The glass grants a tasteless sealing of the bottle. Hence the lengthy process of producing wine will certainly be crowned with success. With the help of a specially prepared bottling plant the glass stopper is pressed onto the bottle, so that in the next step the aluminium cap can be mechanically put over it. This cap is being fixed to the bottleneck by a sealing ring.

**A safe long-term solution**

The glass stopper is predestined for all kinds of wine and champagne, from prime quality wines to Trockenbeerenauslese. One big advantage of this innovative idea is the resealability of the bottle. Thereby a delicious and long-lasting consumption of the wine is granted. More than 40 million times the glass seal has been put on a variety of wine bottles and inexorably continues its triumphant advance throughout the world. Thus the innovation of the glass seal shows the importance of reacting to changes in order to accelerate progress.
Dental Innovation Symposium challenges the future of composite materials

Heike Fürst, 3M ESPE, Seefeld, Germany

Quo vadis restorative dentistry?

The 4th 3M ESPE Dental Innovation Symposium, entitled “The Future of Composites”, was held in Munich from October 28th to 30th, 2007. At the occasion of the launch of the new Filtek™ Silorane direct posterior restorative, about 150 international dental professionals were given the opportunity to attend the program in the hotel “Bayerischer Hof” which featured presentations by renowned European scientists on innovations in direct composite dentistry.

True to its motto, the international conference in the impressive setting of the Munich hotel aimed at questioning the status quo in composite dentistry. The opening of the symposium by Dr. Alfred Viehbeck, Global Technical Director at 3M ESPE, and chairman Prof. Reinhard Hickel, University of Munich, was followed by 15 lectures by scientists from Germany, the Netherlands, Switzerland, Belgium, Iceland and the UK.

By developing the Filtek™ Silorane Restorative System, 3M ESPE accepted the clinical challenges of filling therapy. They created a revolutionary restorative system with excellent material and handling properties which provided the groundwork for the scientific presentations of the Dental Innovation Symposium. The lecturers presented the latest insights and study results concerning direct composite dentistry. They also referred to the different characteristics of the Filtek Silorane restorative system such as the Silorane chemistry, shrinkage and stress, material properties, marginal results, biocompatibility as well as clinical evaluations.

Dr. Wolfgang Weinmann, developer at 3M ESPE, gave the starting signal for the scientific program with a lecture on “Restorative solutions beyond methacrylates”. By focussing on the mechanical properties of the Silorane composite, he emphasized the excellent material features and the fact that Filtek Silorane restorative system presents a decisively lower level of polymerization shrinkage than the conventional methacrylate-based restorative.

Evidentially, the innovative ring-opening Silorane system chemistry enables a clinically verified, exceptionally low volumetric shrinkage of less than 1 % using the bonded disk method, which proves to be the lowest on the market. In addition, the restorative system also provides a very high ambient light stability which enables the dentist a longer modelling period of up to nine minutes under operatory light illumination.

The excellent material features of Filtek Silorane were brought into focus by numerous presentations, held by Prof. Albert Feilzer (Academisch Centrum Tandheelkunde, ACTA, Amsterdam), Prof. David Watts (University of Manchester), Dr. Serge Bouillaguet (Genève), Dr. Nicoletta Ilie (Ludwig-Maximilians-Universität,
Munich), Dr. Martin Rosentritt (University of Regensburg), Prof. Tim Watson (King’s College London), Dr. Uwe Blunck (Charité Berlin), Dr. Gabriel Krastl (University of Basel), Prof. Gottfried Schmalz (University of Regensburg), Prof. Claus-Peter Ernst (Johannes-Gutenberg Universität, Mainz), Prof. Sigfus Thor Eliasson (University of Iceland) and Prof. Bart van Meerbeck (Catholic University of Leuven).

The symposium also included an open panel discussion on the question: “Quo vadis restorative dentistry?”, led by Prof. Paul Lambrechts, University of Leuven, and bringing into focus the aftermath of low shrinkage. Since developing a composite with less than 1 % shrinkage had been the demand of previous symposia, the featured scientists from throughout Europe now concentrated on the consequences of the Silorane chemistry for the market of restorative dentistry and especially for conventional methacrylate-based materials. Moreover, the clinical need for an extended use of new technology platforms outside filling therapy and the requirements of restorative dentistry were further subjects of discussion. The symposium was rounded off with a thematic focus on dental adhesive materials, with special emphasis on innovations, strategies and technologies.

Here, the dentists voted on essential developments using an electronic option finder. One question dealt with the three most important improvements of future resin based filling materials to be made. The need for long term hydrolytical stability, contamination tolerance and antimicrobial activity were given the highest ranks. When asked what would be their most important value of resin based self adhesive filling materials, the majority (more than 40 %) voted for increased robustness of the restorative procedure due to less treatment steps.

During the event, the international dental professionals were given the opportunity to ask questions and collect information first hand. In this way, the Dental Innovation Symposium not only enabled the presentation of the latest research and studies, but also provided a communication platform for all participants to exchange ideas on innovative technologies and materials in direct composite dentistry.
Minimundus

Behind the scenes of a shrinked world

Heike Fürst, 3M ESPE, Seefeld, Germany

Imagine a sightseeing tour around the world – from the great opera in Sydney to St. Peter’s Basilica in Rome, to the Statue of Liberty in New York and back to Neuschwanstein castle in Germany – all in one day. MINIMUNDUS, the famous amusement park located in the Austrian city of Klagenfurt makes it possible.

The smallest of worlds supports the smallest of people

As its name implies, MINIMUNDUS is all about shrinkage: 150 miniature models of the most famous sights from the five continents are displayed, mostly in the scale of 1:25. Since its opening in 1958, more than 15 million people have visited the grounds of 26,000 square meters near the Woerthersee. The shrinkage sightseeing-tour thereby goes to a good course, since the proceeds accrue to the child aid organization “Save the Children” which is the owner of the park.

Most famous sights of the world shrinked to miniatures

In manufacturing the models, the expert model makers of MINIMUNDUS have paid close attention to the smallest details. As an example, they tried to adhere to the same materials used on the original sights, such as marble or sandstone. This is why, every day, visitors to the park marvel at the realistic miniature copies of Abu Simbel in Egypt or the famous Cathedral of Brasilia, among many others. Children as well as adults are virtually placed in the natural surroundings of the original sights, since parts of MINIMUNDUS have even been turned into desert or tropical rain forest landscapes.

Experience “edutainment” in a walk around the world

Within the grounds of the amusement park, along with its landscaping and floral displays, which has become an Austrian sight itself, the concept of “edutainment”, a combination of entertainment and education, prevails: during their walk through the park, the visitors learn valuable information on other countries, cultures and architectural styles. 3-D presentations of the model interior, audio guides and original sounds support the effect.

The miniature world – ever changing, ever moving

Furthermore, the shrinked world of MINIMUNDUS is always in motion. Not only are old sights replaced by new ones, the models themselves are ever on the move: as an example, every hour the visitors witness a miniature space shuttle blasting off.

Enjoy the small things in life in a mini version of it

MINIMUNDUS is a perfect example of how shrinkage enriches our lives. It makes it possible to virtually travel around the world and from one continent to another – and back – in an instant. Moreover, it helps to understand foreign cultures and makes the world a bit more accessible. But most important: it causes amazement and lets us rejoice over the small things in life – in the true sense of the word.
3M Cold-Shrink Tubing

Cold-shrink tubing – useful in dentistry?

Rainer Reeken, 3M, Neuss, Annika Meyer, 3M ESPE, Seefeld, Germany

Cold-shrink tubing are tight sleeve coatings offering protection from extreme heat, dust, moisture, corrosion or mechanical loads. Close and uniform adaptation to the object to be protected shields the latter from adverse environmental influences, prolonging the useful life of the protected objects and improving their long-term performance. The main areas of application are electrically installations, whether indoor or outdoor, underground or under water, as well as cable sheath repairs for electrical and non-electrical applications.

The cold-shrinking technology was first developed by 3M in the 1970s. 3M cold-shrink tubing is fast and simple to apply and requires no tools. Applying the tubes according to specifications requires no experience in hot- or cold-shrinking technology. EPDM tubing (ethylene-propylene-diene terpolymers) features very good mechanical properties, while silicone cold-shrink tubing is extremely resistant to thermal load.

As the illustration shows, 3M cold-shrink tubing is delivered factory-expanded on a helical support core. To apply 3M cold-shrink tubing, place the expanded tube on the damaged area of the cable. Slowly unwind the core, allowing the tube to shrink automatically to the desired diameter, protecting or sealing the affected region. 3M cold-shrink tubes are easy to remove because they do not possess or require an internal adhesive coating due to the persistent radial contact pressure.

It is therefore not surprising that applications for cold-shrink tubing in dentistry have been considered. For example, the effects of wear and tear on a turbine’s handpiece-connecting tubes that appear over time can be addressed directly by the user in virtually no time. The physical properties of the tubing – such as its high flexibility – ensure that any such repair has no detrimental effect on dental procedural ergonomics. Initial application testing in the dental field has shown that the cold-shrink tubing is “of excellent quality and extremely easy to use” (Technical Support, Nordwest Dental Bayern, Munich, Germany), which has given rise to further optimization efforts to customize the tubing for use in dental units.

Cold-shrink tubing is currently distributed exclusively by 3M via electrical wholesalers.
People & Associations

Award winners visit 3M ESPE Seefeld

British Dental Practice Manager Association

Birgit König, Annika Meyer, 3M ESPE, Seefeld, Germany

Interview with Teresa Witchell, Vice Chairman BDPMA (TW) and the award winners: Sharon Holmes (SH), Kerry Zoina (KZ) and Marie Hobden (MH).

Four finalist of this year’s prestigious Practice Manager Award were invited to visit the 3M ESPE European Center in Seefeld, Germany for an opportunity to get to know more about Practice Managers in UK.

When I was organizing the program for your stay in Munich, many people asked me what practice managers do. Can you give us a short description?

TW: A Practice Manager is responsible for the ongoing design and implementation of agreed upon administrative systems. They work as part of the practice team to assist in the delivery of dental care and services to patients. This coordination between office staff and the patient ensures maximum practice profitability while still conforming to the Health, Safety and Employment legislation and guidelines.

Wow, tough job. What personal attributes do you need for it?

TW: Personal attributes include: team player with strong relationship building skills with staff and patients, pro-active approach, diligent, good written and oral communication skills, motivated and keen to develop and advance their career, and an outgoing personality, able to relate to many different personality types and educational levels.

I saw you how your group braved some very scary funfair rides at Oktoberfest – What has your group learned from your time here in Bavaria?

TW: We were given a tour of a super practice where we learned a great deal about the role of the Practice Manager. A quote from Dr. Englschalk was very telling “at home I am looked after by my wife, and here I am looked after by my PM”. – That’s a very familiar description for PM’s.

KH: I want to adopt the same treatment discussion room as seen in Dr. Englschalk’s practice. I would also like to implement a practice procedure where the PM’s discuss financial aspects of the treatment plan with patients.

SH: We are re-building our Claphan Junction practice after a flood. After this experience I will push for a central sterilization area as I have heard that in the future PCTs are will demand this.

KZ: The 3M ESPE plant was amazing - the fact that they have and do everything on site. Very well run.

TW: What impressed me most was the warm welcome we received on our arrival. The guests felt very special. I was also very impressed with Brigit who gave us insight into her valuable Practice Manager role. Her enthusiasm for her job was obvious and inspiring.

I was also impressed by the quality assurance, how much emphasis is put on research and development, and the commitment to training and development of staff with regard to new products.

KH: I will always remember 3M ESPE, how they make Impregum, and how they package it through the sausage machine! The Germans definitely have a thing for SAUSAGE! During my visit I suddenly started to remember all the other products that they manufacture.
MH: I enjoyed the chance to network and have the opportunity to learn from the other Practice Managers.

KH: Yes, true. I felt that spending time with the other practice managers was so helpful. I enjoyed sharing ideas and finding out that others have the same problems I do - and how to overcome them.

SH: I also learned that we all tend to have the same problems and concerns in our practices and that practice managers often feel that they carry most of the burden alone.

Where can Practice Managers look for support?

TW: The BDPMA works to help busy, stressed practice managers run a successful and profitable practice. We offer support through membership in the organisation.

We also offer 2, full-day seminars a year, an annual conference, website, advice sheets, job competency document and recommended pay scale. There are also awards such as the Practice Manager Award and a career development grant.

Thanks a lot for the interview.

TW: I would like to take this opportunity to thank Steve Foster, Marketing Manager 3M ESPE and Franine Meixner, for making this visit so special and memorable for the winners of the BDPMA Practice Manager Award.
Results

Filtek™ Silorane Low Shrink Posterior Composite

Cusp build-up

Gabriel Krsitl, Basel, Switzerland

1. Caries removal and bevelling

2. Matrix and application of adhesive

3. Reconstruction of the approximal area

4. After removal of matrix

5. Application of further material (Filtek™ Silorane)

6. First layer into the cavity
7 Vestibular layer

8 Lingual layer

9 After polishing
Combining innovation and quality

3M ESPE – Driving force in the industry

Heike Fürst, 3M ESPE, Seefeld, Germany

Interview with Dr. rer. nat. Rainer Guggenberger, Member of the Executive Board and Head of Research and Development at 3M ESPE AG, Seefeld, Germany.

Dr. Guggenberger, just recently “The Anaheim Group”, the renowned US research institute, awarded 3M ESPE the title of “Most Innovative Dental Company” for the second year in a row. What does innovation mean to 3M ESPE?

Dr. Guggenberger: Innovation is very important to us. We have a remarkable history of innovations that have enabled many facets of the dental industry. Although many of our inventions are delivered in the form of individual products, we concentrate on improving the whole dental treatment process. Let us take prosthetics as an example; time savings for the dental surgeon are a top priority. We are involved in practically every step of the process; from the initial impression right through to the final cementation. This is also true in the area of direct restorations, where we have developed innovative restorative materials and adhesive systems. In the development of new solutions for the dental practice and dental laboratory, we devote particular attention to clinically relevant product features to ensure an effective and efficient workflow. Research and Development at 3M ESPE is by no means confined to the proverbial „Ivory Tower“. Our research and development always is carried out in close collaboration with dental experts and practitioners from all over the world.

In your opinion, what have been the most important innovations from 3M ESPE over the last five years?

Dr. Guggenberger: We have always focused on precision and aesthetics. Thus, in the field of crown and bridge restoration technology, we particularly focused on these material characteristics during the development of Lava, our all-ceramic (zirconia) material for CAD/CAM technology. Other leading materials include all ceramic (zirconia) CAD/CAM technology and our expanded range of impression technology products, Express 2 for indirect restorations, and our self-adhesive composite material RelyX Unicem, which provides a superior one-step method for permanent cementation. In modern restorative treatment we have been industry pioneers, bringing nanotechnology to the dental world. Our nano-composite Filtek Supreme XT opens up new possibilities in direct restoration techniques, bringing together key attributes such as aesthetics and strength. I’d also like to mention new research that has led to the development of a practically shrinkage-free material for posterior tooth restorations. The results of this innovative research will soon provide an enhanced solution for the dental surgeon.

How does 3M ESPE forge its place in today’s dental industry?

Dr. Guggenberger: From a technical point of view, it is the combination of innovation and quality on which the user can rely. Our aim at IDS this year was to communicate successfully our view of modern dentistry. Visitors to our booth were able to follow the specially constructed „Walk of Innovation“, which took them through a number of our innovations and highlights for 2007. This was a real feast for our visitors, who were able to test, touch and even taste our inventions. Our innovative products improve the patient’s well-being by promoting techniques that require less tissue removal, use the most biocompatible materials and ensure high quality, high aesthetic direct and indirect restorations. We provide innovative solutions for many aspects of dental procedures and it is this holistic strategy that gives 3M ESPE a strong place in today’s dental industry.

What is 3M ESPE currently working on and researching, and where do you see the most innovative concepts for future developments in the world of dentistry?

Dr. Guggenberger: Alongside the increasing digitalisation of processes and the growing importance of prevention – to which we are devoting our full attention – we see a great potential in new chemical concepts for restorative materials. The highly innovative silorane chemistry forms the basis for our new posterior composite. This material provides the dental surgeon the opportunity to work with the only material in the world that boasts a volume shrinkage of less than 1%. Filtek Silorane will be available in September of this year and has already met with an enthusiastic response from dental experts. That level of reduced shrinkage offers numerous clinical advantages, which ultimately support our top priority target of ensuring the long-term integrity of a direct restoration.
Furthermore, with Filtek Silorane, we aim to provide the clinician with a treatment procedure which is as simple and convenient as possible. Initial clinical evaluations and tests carried out by experts indicate that we have indeed achieved this goal. Like other composite materials, Filtek Silorane is also applied in individual layers and cured. The application is very simple and the dental surgeon has plenty of time to form the plastic material as desired so that finishing work is considerably reduced.

*What makes 3M ESPE so successful? What is the secret to its success?*

**Dr. Guggenberger:** In my opinion, it is our unique ability to combine a wide range of technology platforms within 3M and our strongly dental oriented fundamental technology platforms here at our German operation in Seefeld. In many cases we are pioneers in the industry, able to successfully convert new technologies into innovative solutions for dentistry. These new solutions benefit the patient, dentist and dental lab technician. So it’s no exaggeration to say that the customer – dental surgeon or dental technician – is involved at every stage of our development process. Last but not least, the success of our innovations is backed up by a long list of successful market launches of ground-breaking solutions. Dentists and technicians benefit from our decades of expertise. Based on their positive experience over many years they developed high trust for the quality of our products. This confidence motivates us to continue following our journey of high-speed innovation.
Calendar of Events 2008

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Published by:
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Production:
www.eberl.de · Immenstadt/Germany

Design and typesetting:
www.eberl.de · Immenstadt/Germany

Global circulation:
120,000

We accept no liability for unsolicited manuscripts or photographs.
Court of Jurisdiction: Munich

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