By Dentsply Sirona

Every day, Master Dental Technician Werner Gotsch faces the question of what materials can help him keep his laboratory in Marktleuthen, Bavaria – healthy and economically viable. Moreover, his customers, who include dentists from all over the country, expect more of him than just “standard quality.” What they do expect is individual, aesthetic, precise fitting restorations made from materials whose quality is beyond reproach. Werner Gotsch had the opportunity to accompany the development of the new zirconia-reinforced lithium silicate ceramic, Celtra® Press. In this interview, he tells us what sets this material apart.

Mr. Gotsch, what prompted you to get personally involved in the development of the Celtra® Press pressable ceramic material?

Gotsch: To answer this question I have to back up a bit, because there is a fundamental issue we need to clarify first. I am talking about the general role of pressable ceramics. To me, these materials have the greatest potential – along with zirconia – when it comes to creating highly aesthetic and durable restorations. Their process-related variability and aesthetic properties have now made pressable ceramics indispensable in the dental laboratory. However, despite all the advantages of the material and the associated procedures, all systems on the market also have certain shortcomings. So when Dentsply Sirona approached me with a request to get involved in the development of a new system that does not have the known disadvantages of existing systems, I agreed immediately.

It is probably not really that fair to talk about the disadvantages of other products. Let us talk about the outstanding characteristics of Celtra® Press instead. So what are they, specifically?

I want to make one thing clear: there are very good pressable-ceramic systems on the market. But if something is already good, that does not mean it cannot be improved further. I myself am not a materials scientist. I can only describe my impressions, which I collected in an intensive testing phase and communicated to the company. In simple terms, one could say that the main advantages are precision of fit and aesthetics. Celtra® Press forms no reaction layer on its surface, that is, at the interface with the investment material. This means that your divested structures are the same as the one you invested. This is impressive and of course has a positive impact on the fit and the precision of the pressed structures.

The reason for this is the special investment compound; a completely new development that is part of the Celtra® Press system and that prevents the formation of a reaction layer on Celtra® Press objects. This means that the objects can be easily divested using nothing but glass beads and that, moreover, the objects will fit after divesting without major finishing efforts. Which saves considerable time.

You were talking about aesthetics. How does Celtra® Press measure up in this regard?

The level of aesthetics that I achieve with e.max® is already pretty impressive. Now I was given a material, Celtra® Press, which claims to be a further improvement on this aesthetic result. My honest opinion? I thought that was just another one of those typical marketing claims. But then I found that Celtra® Press ingots truly offer great shade fidelity. With many pressable ceramics, the result deviates from the initially selected Vita®-classical shade, so the objects need to be adjusted by ornate staining to obtain the right shade. With Celtra® Press you get the exact shade after pressing that you selected in the first place. In practice, that saves me an incredible amount of extra work. Add to this the material’s pronounced opalescence, which ensures that the shade of the adjacent teeth is “taken over” – downright absorbed, if you want to put it that way. This results in extremely high-quality aesthetic results – without time-consuming reworks.

Are there any other aspects that you would like to highlight?

Let me remind you that I am not a materials scientist. But in a close cooperation with a research and development department you do end up learning one thing or another. For example, there is the high strength of Celtra® Press that results from the fact that the lithium silicate is reinforced with zirconia. This ensures a strength of more than 100 MPa. And this is why it is possible to produce bridges up to the second premolar with this material. The material is very stable at the edges, and the marginal accuracy is very high. Moreover, I have never before encountered a pressing material that flows as well as Celtra® Press does – which makes it possible to press even larger objects with only one sprue. So here is another one of those points that provide real added value to my laboratory, saving me time in spraying, separating and finishing.

In all, Celtra® Press has succeeded in introducing a new pressable ceramic system that combines excellent processing characteristics with high strength and great aesthetics. This reduces my lab time, I get a broader range of indications, and the optical properties facilitate restorations whose appearance is no way inferior to the natural teeth.

Another advantage that I see is that the BFS e.max® muffle system can be used for Celtra® Press and that the material can be processed using all commercially available pressing furnaces. Therefore, no additional capital investment is required in the laboratory.

That sounds very enthusiastic. How would you describe successful dental technology today?

I would cite a phrase I often use at the end of my lectures or one of my workshops, a phrase that is more relevant today than ever: “Successful dental technicians are characterised by their passion for perfect restorations – and by their business acumen.”

The interview was originally published in Dental Dialogue VOLUME 26.
In matters of aesthetics, dental technician David Zweifel would be a difficult man to surprise in a hurry. In this interview, the experienced laboratory manager and material specialist from St. Gallen explains how extremely thin walls can be created without difficulty and why CAD/CAM composite blocks are already proving to be the new magic bullet in everyday work.

Originally, the passionate expert on aesthetics wanted to become a goldsmith. Now he is busy creating "oral jewellery". David Zweifel of Switzerland has now spent over 30 years passionately working as a dentist technician in St. Gallen. In the process, he has seen many a material trend come and go. On the occasion of his 50th anniversary of service, he spoke to us about novel high performance composites, dentists resistant to advice, and digitisation in modern prosthodontics.

Mr Zweifel, what must the perfect dental material deliver in your opinion?

D. Zweifel: The best dental material is still the natural tooth, wouldn't you say? Ideally, a state-of-the-art material would offer properties close to those of human teeth, as both in terms of abrasion resistance as well as gloss retention and durability. At the same, the restoration should provide a harmonious match to the patient's teeth and he or she should be able to do without the opposing tooth. What good is a stable connection if the problem is only transferred to the other jaw?

Fortunately, materials research has recognised that a material with a low modulus of elasticity demands material forces much better than the traditional hard as steel restorations of the 80s and 90s. If you think, we are presently experiencing a renaissance of highly flexible composite solutions.

Does that mean that the composite all-roundr will soon be banishing ceramic completely from the laboratory? It is true to say that Röntrend Composites CAD/CAM blocks are presently the rage. Dentists are already aware of the advantages of this versatile material from classical filling therapy. Nowadays, final inlays, onlays, fully anatomical crowns and veneers can be fabricated quickly and easily from composite using the classical CEREC manufacturing process. The submicron hybrid blocks and Crios blocs are fast becoming an all-purpose answer in everyday lab routines.

During grinding, a modern composite material is far better materials than ceramic and is easier to shape. Subsequent corrections in shape or shade can be realised easily by the clinician in his/her own practice, which of course also meets the needs of dentists. Overall, the accuracy of fit of acrylic crowns is extremely high and the flexible material fits more harmoniously into the row of teeth than brittle ceramic.

How about sculptability? Which margin thicknesses are possible with state-of-the-art composites?

For example, I was able to play the role of "middle" for the innovative BRILLIANT Crios submicron hybrid composite material of Swiss dental specialist COLTENE and was closely involved in its development. During the lengthy fine tuning process, I myself must have ground hundreds of units. What impressed me most of all, the walls of the fabricated pieces were perfectly stable every time!

If you take a hobic master look at the margin accuracy, you can see that even tapered restoration margins of only 0.1 mm thickness can be ground perfectly without becoming caged. Failing or even cracks are truly a thing of the past. There is hardly a material which offers so much opportunity for accurate work a virtuoso delight for the Swiss soul.

Why is it that many dentists are still wary of CAD/CAM composite blocks? Well, many dentists are not fully aware, or only vaguely, of the progress composites have made in the past ten years. They still remember the days of earlier mixing materials which were launched with considerable marketing hokum and claimed to be the ultimate solution. Alone in 2016, I had to process guard cases for roughly CHF 1'000 of poorly conceived hybrid acrylics where the margins had not been properly thought out at the time. It is therefore quite obvious that clinicians who have to do with such revisions do not want to hear about these "hybrid ceramics"!

In such cases, considerable powers of persuasion are required to show what true CAD/CAM composite blocks can achieve these days. Bonding is the same as for any other filling. If I want to create a proper monolake, then I must always attach a crown to the adhesive with a bonding system that fits the tooth substance, core build-up or abutment respectively; then I will end up with a good, long-lasting solution.

How do you convince customers who are resistant to advice of the benefits of the new restoration methods?

Those concerned need to experience the high quality themselves, then they quickly become aware of the high quality solutions I can offer. Recently, a patient who was very particular about shade and shaping, wanted to have two of her anterior teeth in the mandible done! Unfortunately, she had little time due to the upcoming holidays. I made the following proposal to the treating dentist: I will grind two crowns as long-term temporary restorations now for cementing. A BRILLIANT Crios milling block in VITA shade A2 was used. The result was a continuous smooth colouration from top to bottom without any discoulouration and a good match to the overall picture of the mouth. After seven weeks, the patient was no longer interested in any other type of restoration. Currently, I have again fabricated a partial crown with the flexible CAD/CAM composite blocks. After the try-in, the patient admitted not be able to detect anything new in the mouth when exploring with the tongue. The high wear com- fort of the restorations convinces even the most outspoken sceptics.

How much time do you save when processing real CAD/CAM composite blocks? I would say, actually go to 50 % faster when all is said and done – and with a result that is far more aesthetic than before. The entire fitting process is eliminated and polishing is unbelievably quick. As the name implies, BRILLIANT Crios blocks have an intrinsic fine satin gloss, e.g. they require little in terms of processing. As a rule, I would recommend a two-step approach to beginners: first core grinding and then the use of two special fine grinders.

Using the "Egg" grinding mode of my CEREC MC XL, the crowns turn out even more beautiful than with the fast mode.

Doesn't increasing digitization and the permanent use of CAD/CAM in everyday lab routines rob dental technicians of their creativity? Not at all, CAD/CAM technology is an excellent support for daily work. Whereas I used to have to tediously apply wax, I can now support cupons exactly and set maximum luster thicknesses. I have become more efficient and at the same time derive better results - what a dream combination! Despite all the craftsmanship in our profession, one cannot afford to be blind with regard to the new media. 3D printing may not be fully matured yet, but such methods will continue to dictate and facilitate our work.

When I saw the first CAD/CAM device of the 1990s years ago, I decided to be part of their development right from the beginning. At the time, I said to my wife that the amortisation costs would certainly not stop me, or, in the words of the Swiss Railways: "I am boarding the train now and I am not going to wait until it arrives in Geneva." Reservations about the initial outlay proved entirely unjustifi- ed in retrospect. I had already easily surpassed the break-even point after only half the calculated time.

In other words: Modernisation pays off...

Absolutely! It never hurts to expand one's service portfolio! Unfortunately, these days people are so afraid to look at the price first. The daily battle against the "Deep Food" mental- ity also affects us in the laboratories, but one should not be much more expensive than a steel denture with mounting. And if I can mill two crowns from a 14 CAD/CAM composite block instead of one, then the material costs are completely different. Those using to check the sums should simply make sure to use the right numbers.

And last but not least, how do you view the future of dental laboratories? If you project the present advances in materials research into the future, then dental materials will become even more accurate and reliable with regard to the special proper- ties of human teeth. Meanwhile, the high performance composites keep offering better quality and more attractive shades, but who knows, maybe we will end up growing bio- regenerative materials in our own laboratories. The dental technician as craftman and artist will definitely not be redundant!

I also have an abundance of ideas for other product innovations among other things, I personally would find tricoloured CAD/CAM composite blocks a highly attractive proposition for the future, where I could always be aware of what one is comparing. For example, I recently had to make an affordable proposal for a patient on social benefits. He did not wear dentures and refused a gold-ceram- um bridge for cost reasons. Finally, I ground a titanium framework and veneered it with composite blocs.

After grinding the crowns and binding everything, the appearance was sensational - nearly like real ceramic, but in contrast, the dentures were reimbursed without any problems by the health insurer. A "high qual- ity long-term temporary restora- tion" position enamel, dentine and incisal edge polishing finally reduced the grinding crowns or inlays. In the long term, I look forward to being surprised by smart devices created by our Swiss dental specialists as well as specialists from around the world.

When the time has come, I will defi- nitely be there; readily waiting at the "railway station".

Perfect walls

Photo: COLTENE