Metal ceramic – well-proven and future oriented

We at Dentallabor Cera-Tech in Liestal/Switzerland, concentrate to a large extent on CAD/CAM technology and spend a lot of time advocating the cause of allceramics. Nevertheless, metal ceramic, comprises around 50% of our range of products and services, continues to remain an indispensable part of our programme.

Gold accounts for 70% of this, and trend increasing – non-precious metal alloys 50%.

The following article presents a corresponding case example.

Customer requirement and planning

The patient's tooth 11 was fractured and tooth 21 showed severe cracks (fig. 1). The requirements of the dentist were clearly defined, and communicated by oral agreement and an order form: the crowns were to be implemented as a standard restoration in metal ceramic, and at the same time blend harmoniously with the patient's oral situation.

For this reason, we decided to have the shade determination performed in the dental practice, and instead of using the casting technique, to fabricate the crown coping by milling a CAD/CAM restoration from a non-precious metal alloy. For the veneer we chose VITA VMK Master, a new metal ceramic for veneering in the classical style, and which promises brilliant shade reproduction.

The implementation

For shade determination we use – with growing enthusiasm – the VITA Linearguide 3D-Master, which is also finding increasing approval on the part of our dentist customers. We like the fact that it is based on the already known linear principle because it does not require any rethinking in terms of the concept. Also in the case described here, the dentist used this for determining the tooth shade. In addition to this, he documented the situation prior to treatment and the results of shade determinations with regard to lightness and chroma by means of digital photographs which he sent us by e-mail. Further discussion of the case took place by telephone. This procedure usually enables us to achieve a remarkably high degree of accuracy, even without the dental technician having come into contact with the patient in person.

The master model was scanned and used as a basis for the virtual framework design, and the latter was milled from a non-precious metal alloy. An important prerequisite for digitisation is that the dentist must be accurate in his preparation work, so that the preparation margin can be easily read by the scanner. The risk of cavities and porosities which could endanger the veneer, and in the event of late cracks result in work covered by guarantee, is no longer given in CAD/CAM manufacture, since the non-precious metal blanks are industrially fabricated according to unified quality standards. A further advantage of the milled non-precious metal copings is their high degree of marginal accuracy. The work required in the fitting of the copings is reduced to a minimum – only the mounting pins have to be removed, and the margin finished in such a way that it tapers thinly.

We used a silver and palladium-free alloy which has high strength values that enable it to withstand a high load capacity. This offers a high-quality, and, above all, a cost-effective alternative to all-ceramic and gold content solutions.

For the opaque application we use the SPRAY ON procedure (fig. 2), so that a thin and homogeneous layer thickness is achieved, which at the same time has good covering power. The restoration was built up using the classical dentine/enamel layering known, for instance, from VITA OMEGA 900. In this way, by using an efficient layering technique, I can quickly and easily obtain an aesthetic result. I am impressed by the stability characteristics of the ceramics. This material property is an advantage especially in the case of larger restorations.

VITA VMK Master offers a comprehensive assortment for

VITA VMK Master®
Brand-new update to a classic!

The new VITA Metall Keramik (metal ceramic) with the well-known, simple layering technique.

VITA shade, VITA made.

VITA VACUMAT New Generation – the individual, highly efficient firing system for your laboratory! Control up to 4 VITA VACUMAT 6000 M / 6000 MP premium ceramic furnaces in a simple, fast and convenient manner thanks to one-touch control! The devices feature a compact design and always ensure excellent results: www.vita-new-generation.com
If dentist and/or patient insist on state-of-the-art equipment on a metal ceramic instead of an attractive solution with natural we can offer good, competitive 

The final glaze firing achieves a shade brilliancy which awakens just a few different materials, possible to assess whether the tooth to life. There is a natural and translucent regions. As individualisation. In this case, however, because a standard solution was requested, I kept to just a few different materials, and modelled only the mame locations. I built up the incisal edge and the approximal areas by applying ENAMEL (EN1), and OPAL TRANSLUCENT (OT1) (fig. 5). The restoration was fired at 950°C, the approximal and palatal contacts adjusted, the latter in the articulator with lateral and protrusion movements under canine guidance before the finishing of the restoration. I am very impressed by the very low degree of shrinkage, which I will be pleased to take into account when layering in future. A generous application of porcelains at the approximal points in order to compensate for shrinkage is not necessary to this extent, as I am accustomed to doing with other ceramics. The final glaze firing achieves a shade brilliancy which awakens the tooth to life. There is a natural \n
**Conclusion**

Our aim is to provide an attractive solution with natural aesthetics in the VMK technique, even in cases which initially do not look very promising. If dentist and/or patient insist on a metal ceramic instead of a full ceramic highend solution, we can offer good, competitive results using our CAD/CAM system and VITA VMK Master, which is based on a combination of state-of-the-art equipment and highquality materials. Thanks to the use of a ceramic which is simple to process, pleasant to work with, and has a wide processing interval and accurate shade reproduction, which, in combination with the VITA Linearguide, enables the fabrication of crowns with natural aesthetics, time-consuming adjustments and corrections are usually unnecessary. We would appreciate a sample copy of any reprints.

**VITA Zahnfabrik H. Rauter GmbH & Co. KG**

Headquartered in Bad Säckingen/Germany, VITA Zahnfabrik H. Rauter GmbH & Co. KG has been developing, producing and marketing innovative solutions for dental prosthethics according to consistently high quality standards for over 85 years, and has been known from the very beginning as a pioneer and worldwide trendsetter. The VITA shade standard, for instance, is recognised internationally in the dental branch as a shade reference system. Users in 120 different countries benefit from the comprehensive range of products and services provided by VITA Zahnfabrik. These include analogue and digital tooth shade determination systems, acrylic and ceramic teeth, veneering and framework materials for conventional and computer-aided manufacturing procedures, dental equipment as well as a wide range of service and training facilities.

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**Product description:**

Today, the company diversifies its products range in 6 branches of industry, for the dental market (dentists and laboratories) and out-dental (jewellery, clock industry, spectacle industry, visual arts, agro-alimentary...). Dental and laryngeal mirrors (Actual, Holy, Holyclar, DMS), the abrasive discs Speedy, dental instruments (diagnostic, restoration, parodontology, extraction, dental surgery, implantology, laboratory), the burners (Miniflam, Holy, Labosflam, Maticflam, Microtorch, Protorch), dental waxes, demonstration and study models.

Our mirrors are made of french stainless steel, by automatic or handmade process, with quality control at each stage of assembly (ISO 9001:2008 certification). The amount of mirrors produced by day can reach 10.000 units. We provide personalization of the packaging and mirrors with laser etching on-demand.

**Fig. 1:** Situation before treatment. **Fig. 2:** Opague application in the VITA SPRAY ON procedure. **Fig. 3:** Completing the build-up with enamel and effect porcelains. **Fig. 4:** Final view directly after seating the restoration. **Fig. 5:** VITA VMK Master.