

DENTAL  
**VISIONIST**  
**VITA VIONIC® DENT DISC multiColor**  
The milled tooth for long-lasting full and partial dentures

**VITA teeth made from  
multichromatic composite discs  
VITA VIONIC DENT DISC multiColor**  
Lukas Wichnalek and Arbnor Saraci



**Occlusal freedom with  
VITA VIONIC DENT DISC multiColor**  
Marc Wagenseil



**Precision-fit premium teeth  
from the polychromatic disc**  
Lukas Wichnalek, Norbert Wichnalek,  
Arbnor Saraci, Patricia Strimb



# VITA teeth made from multichromatic composite discs VITA VIONIC DENT DISC multiColor

*Lukas Wichnalek and Arbnor Saraci, Zahntechnik Wichnalek – HIGHFIELD.DESIGN, Augsburg, Germany*

When fabricating combination prosthetics, it was common practice to make basal and occlusal modifications to prefabricated teeth. Every tooth had to be handled individually and adapted to the framework structure. The next logical step was to fabricate the dental material on frameworks individually using a single CAD/CAM-supported mould. The VITA VIONIC DENT DISC multiColor comes from a company whose knowledge of prefabricated teeth has grown historically for 100 years and is part of the company's DNA and name:

VITA Zahnfabrik. The multichromatic disc made of the proven VITA MRP (microfiller reinforced polymer matrix) composite formulation now offers the well-known quality and esthetics of VITA premium teeth for combination prosthetics, which are created using the design software to perfectly fit the patient. In the following interview, Lukas Wichnalek and Arbnor Saraci (both of Zahntechnik Wichnalek – HIGHFIELD.DESIGN, Augsburg, Germany) report on their successful use of the disc.

## Final result

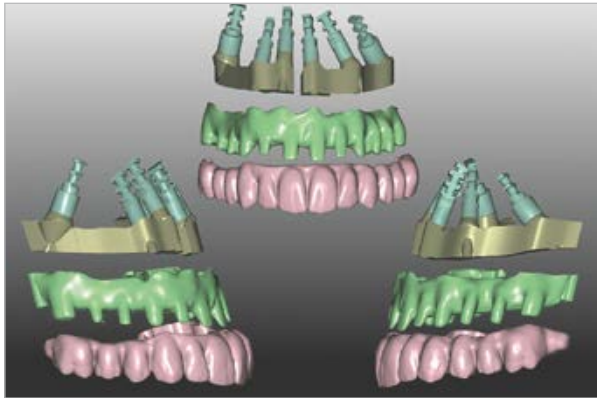


**What made you choose VITA VIONIC DENT DISC multiColor for the CAD/CAM-supported fabrication of combination prosthetics?**

**What kind of work do you use the material for?**

*Lukas Wichnalek:* VITA premium teeth have been proven clinically and in the laboratory. We use the VITAPAN EXCELL, the VITAPAN LINGOFORM and the VITA PHYSIODENS ourselves. When we learned that there was going to be a multichromatic disc made of the same composite material that would offer the same workability - abrasion resistance and esthetics for the digital workflow - we were immediately intrigued.

*Arbnor Saraci:* The VITA VIONIC DENT DISC multiColor allows us to create the tooth material individually and accurately in the CAD software using a single cast in the proven quality of the prefabricated teeth. We use the composite material for implant and partial prosthetics. The need to tediously grind out individual teeth to adapt them to framework structures is now a thing of the past in our laboratory.



Construction with zirconia bridges, a secondary framework made of PEEK, teeth made of VITA VIONIC DENT DISC multiColor.

**What would some other alternatives for fabricating the tooth elements be, and what advantages does the VITA VIONIC DENT DISC multiColor offer in this context?**

*Lukas Wichnalek:* Prefabricated teeth can still be milled and adjusted. Composite layering on the secondary framework is also an option, but it is extremely time consuming and requires experience. The injection technique with flowable composite is also possible, although the production of a prototype takes quite a long time to prepare in advance, which means that no shade gradient can be created.

*Arbnor Saraci:* In contrast, the shade gradient is already integrated into the VITA VIONIC DENT DISC multiColor, and I obtain a tooth material that is absolutely free of air bubbles after the CAD/CAM-supported fabrication. In terms of abrasion resistance and overall longevity, dental arches that are milled out in one piece are certainly more durable than manually layered or injected composite.



The tooth material can be ground out of the VITA VIONIC DENT DISC multiColor in wafer-thin layers.

# Removable Complete and Partial Dentures

## What is your process for preparing the VITA VIONIC DENT DISC multiColor? How did the finishing process go?

*Lukas Wichnalek:* The dental material comes out of the milling unit with high precision. As a result, the micromorphology that we select from our tooth database is already beautifully achieved. After removing the workpiece from the VITA VIONIC DENT DISC multiColor, I can immediately concentrate on the fine details, i.e., the micromorphology, texture and polish.

*Arbnor Saraci:* The composite material of the VITA VIONIC DENT DISC multiColor is really easy to process and polish. We first use cross-cut milling cutters, and then fine diamond-coated grinding instruments. This is followed by a simple pre-polishing using the VITA ENAMIC Polishing Set Technical, and a short high-gloss polishing using VITA Polish Hybrid (which is matched to the material), as well as a brush with goat hair bristles and a leather buff.



The implant-prosthetic components were a perfect fit.



The delicate dental arch made of VITA VIONIC DENT DISC multiColor can be precisely positioned on the secondary framework.



The dental arch attached to the secondary framework showed vivid translucency.



The base is then built up using a cold-curing polymer and sandblasted for individualization.

**What feedback have you received from practitioners regarding the esthetics of the VITA VIONIC DENT DISC multiColor?**

*Lukas Wichnalek:* Since, the shade matches the VITA shade standards, so you automatically buy the right shade with the blank. This is a huge advantage, especially when it comes to partial dentures. The shade accuracy with the VITA VM LC flow veneering composite is also a great advantage, in terms of quickly creating a basic shade harmony between telescopes and the tooth material from the VITA VIONIC DENT DISC multiColor.



The finished implant-prosthetic restoration after mucogingival reproduction with the veneering composite VITA VM LC flow.

*Arbnor Saraci:* And the real highlight is that the disc and its integrated shade gradient ensure that the tooth material has a natural appearance. The balanced shade gradient automatically creates a vibrant translucency in the thinner incisal edge. This is why the teeth that are individually fabricated from VITA VIONIC DENT DISC multiColor are so popular with our customers, and above all, the patients.



Macroscopic view of the posterior teeth with natural translucency and shade gradient.



Lateral view of the vibrant tooth material from the VITA VIONIC DENT DISC multiColor.



The VITA VIONIC DENT DISC multiColor offers the esthetics and functionality of a VITA premium teeth.



# Occlusal freedom with VITA VIONIC DENT DISC multiColor

*Marc Wagenseil DD, RDT, VITA International Speaker, Edmonton AB, Canada*

I had the opportunity to challenge myself, as well as the digital technology. An implant-supported full class 1 denture in the upper jaw was to be manufactured using the most recent 3shape software (3shape A/S, Copenhagen, Denmark) and polychromatic composite disk VITA VIONIC DENT DISC multiColor (VITA Zahnfabrik, Bad Säckingen, Germany), which has

recently arrived on the market, for the subtractive manufacturing of denture teeth. The interaction of traditional experience with new technology inspired me to once again break new ground, and to challenge the status quo and my own professional complacency when treating complex implant cases.

## Case study

The patient came to the practice because he needed a new restoration in the edentulous upper jaw. Since the patient did not like the fit, the foreign body sensation or the functionality of a conventional denture, implant insertion had been suggested in advance, to which the patient consented. The new full denture was to be stabilized on top of four implants with Novaloc abutments (Straumann, Freiburg, Germany). In the treatment plan, we decided to manufacture the full denture

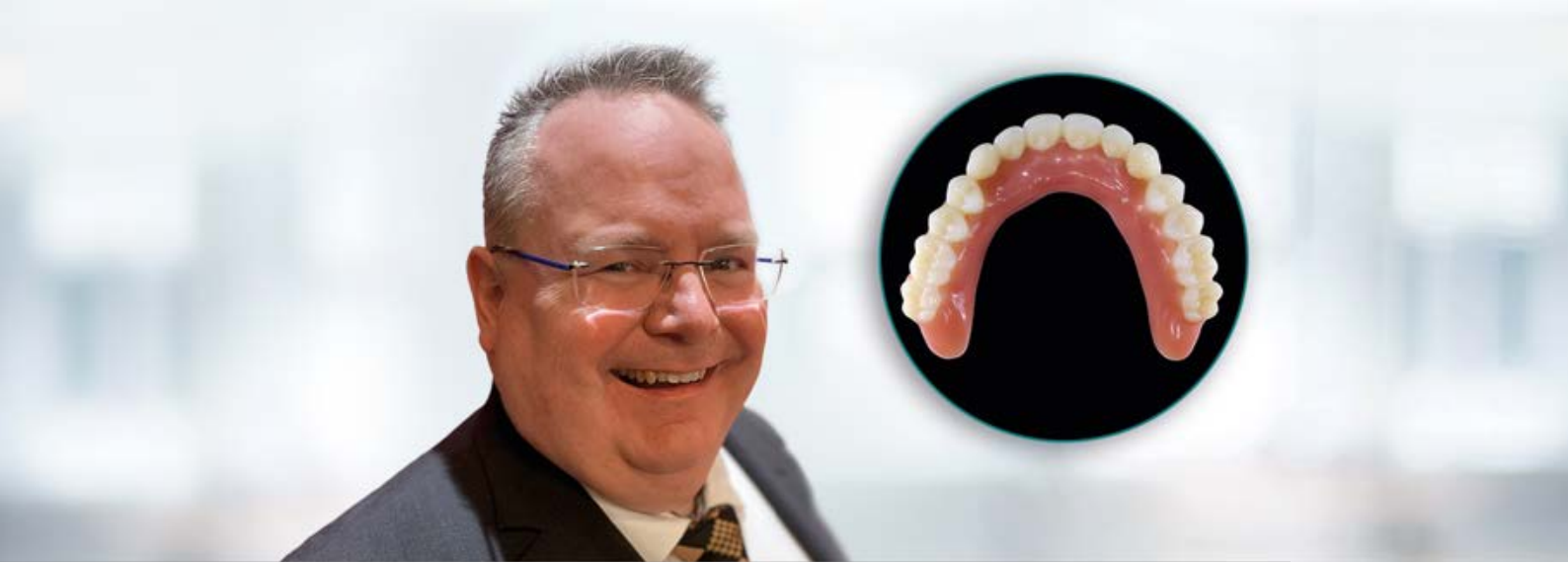
using the digital workflow. The goal was to show whether the digital denture could be manufactured more easily, and whether a similar or even better fit could be achieved after integration, compared with conventional full dentures. Of particular interest here was the integration itself, as well as whether the abutments had to be integrated into the denture base in the treatment chair or in the laboratory.



The upper jaw after the insertion of the four implants.



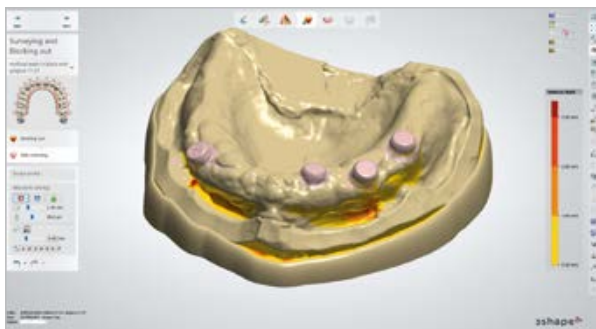
Final result.



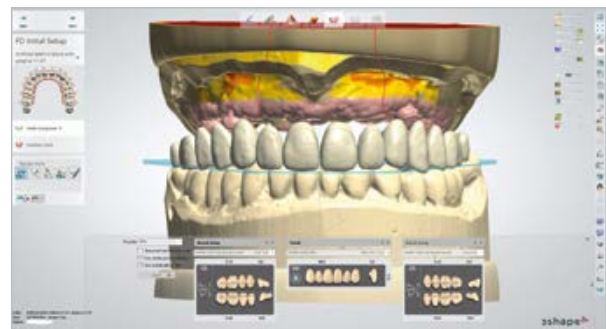
**The treatment phase included the following steps:**

1. The palate portion was to be freely designed.
2. The base from the VITA VIONIC BASE DISC HI should not be additionally reinforced.
3. The angulation of the implants should not be corrected. This decision was made because of the flexible angulation compensation with the different Novaloc Locators. They make it possible to compensate for the leverage provided by the extended free end. At the same time, the strain on the implants was reduced despite the unfavorable positioning while chewing. A prosthetic correction of the angulation would only increase and strengthen the leverage effect. A trouble-free, occlusal freedom in centric was also essential in order to provide even more compensation for the load stress.

4. The focus was on making the occlusal morphology of the teeth functional within the patient's chewing cycles, while at the same time transferring the freedom of movement concept to the VITAPAN LINGOFORM posterior teeth. The VITA VIONIC DIGITAL VIGO denture tooth library, available in the 3shape software, is based on the design of the VITA VIONIC VIGO prefabricated teeth, which are in turn based on the design of the VITAPAN EXCELL anterior teeth and the VITAPAN LINGOFORM posterior teeth. Their basic functional principle was automatically transferred to the patient's occlusion. Note: The VITA VIONIC DENT DISC multiColor is made from the same VITA MRP (Microfiller Reinforced Polymermatrix) composite formulation as the premium teeth VITAPAN EXCELL and VITAPAN LINGOFORM.



The virtual model during the analysis and block-out phase.



The virtual setup with the selection of tooth shapes

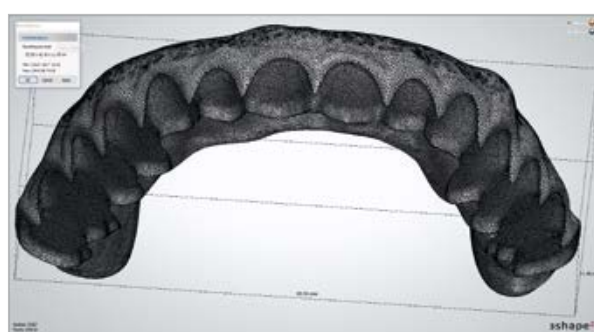
# Dentures on Mini-Implants.

5. Treatment continued with intraoral scans of the lower dental arch and the alveolar ridge in the upper jaw. Note: The updated version of 3shape software (3Shape Dental System 2022) includes an option for the prosthetic implant components used in this treatment. Once the scans and registration were uploaded, the design of the denture began. VITA VIONIC VIGO 045 and 22L were the teeth selected. The posterior contacts were adjusted and confirmed in order to implement freedom in centric.



Checking the occlusal contacts and the freedom in centric.

6. The dental arch and denture base were manufactured subtractively and fixed using VITA VIONIC BOND.  
7. Due to the virtual integration of the Novaloc Locators in the software and the high milling precision, the matrices clicked into the denture base after subtractive manufacturing. To ensure a secure bond, the matrices were also integrated into the denture base using DTK adhesive (Bredent, Senden, Bavaria).



The STL file of the dental arch for the denture.

## Background information

**Freedom in centric:** Freedom in centric is defined as a “flat area” in the central fossa in which the antagonist cusps have 0.5 to 1 mm of eccentric freedom of movement upon contact, unaffected by tooth inclination. All natural teeth work according to this concept, but very few denture teeth have it integrated.

**Why is freedom in centric important?** This concept is important because denture teeth are not innervated. This means that a patient cannot feel when the teeth are in occlusion or if they are almost in occlusion. It is important to note that there is food between the teeth during chewing and it is not possible to create perfect centric contact with each individual chewing cycle, as is possible in the articulator during the manufacture of dentures. And then there is also the fact that full dentures are supported by mucous membranes. When considering these two aspects, it is actually inconceivable

that a patient with full dentures can always return precisely to centricity. For the same reason, the natural dentition – even if we can feel our teeth during the chewing process – cannot achieve precise centricity after each chewing cycle. This is also the main cause of instability and tension within the denture.

**Why was freedom in centric important for the success of this treatment?** Due to the distribution of the implant abutments, a free occlusal concept without interference was important for preventing a leverage effect. A prefabricated tooth with a locked centric would not allow this compensation to achieve a good denture fit and the desired function. This applies in the present case, especially with regard to the pronounced free end distal from the area of the implant support. For this reason, the patient needs a flexible and adjustable occlusal design.

<sup>1</sup>Schuyler CH. Freedom in centric. *Dent Clin North Am* 1969 Jul; 13(3): 681-6.



## Matrix

As already described, special attention was paid to the locators because the matrices were integrated into the denture base in the laboratory and not at the patient's chair. As a result, we had to check whether the dimensional transfer of the implant position into the software, in conjunction with the precise subtractive manufacturing, would make it unnecessary to integrate the matrices on the patient chair-side. Bonding in the laboratory can reduce chair time by 1.5 to 2 hours. That is much more comfortable for the patient

because less work needs to be performed inside the mouth. However, the matrices can also be fixed in the laboratory with an accurate model and a careful, precise conventional procedure. Subtractive manufacturing of the base and bonding of the matrices in the laboratory was effective and accurate in this case. Due to the complex implant distribution, a precise relationship between implant head and matrix was a must, especially in this clinical situation.



VITA VIONIC BASE DISC HI and VITA VIONIC DENT DISC multiColor.



The completed digital denture.



Basal view of the denture with the integrated matrices.

# Dentures on Mini-Implants.

## Summary

- Analog or digitally manufactured denture teeth that are designed with occlusal freedom provide stability, flexibility and adaptability to the patient's chewing cycle. The occlusal design can be modified in the production of tooth material with the VITA VIONIC DENT DISC multiColor to obtain the desired reliability and function.
- Hitting and sliding on the main cusps is the main cause of these well-known denture problems.
- This treatment plan demonstrates the challenges of dealing with one's own professional complacency, and the digital workflow for the production of implant-supported dentures.
- The VITA VIONIC DENT DISC multiColor enabled an easy to implement and time-saving workflow that created a high-quality denture.



The upper denture in situ.

## Summary

As denture professionals, we have to create this form of care specifically for each patient and not expect them to simply adapt to their new dentures. In order to achieve this, denture teeth that are adaptable must be used. On the other hand, self-reflection is important to prevent complacency and to allow an adaptation of the skills needed for the specific requirements of the patient case. Freedom in centric is the possibility of moving within the centric contact and therefore not to be blocked in a bite. This concept allows for flexible occlusal adjustment to the patient's needs, but has only been integrated into a few prosthetic tooth designs available to us. In this case, the successful treatment can be attributed to precisely this freedom, which is contained in the VITA tooth library and in the subtractively manufactured dental arch from the VITA VIONIC DENT DISC multiColor.

If we want to be superheroes for our patients, we need to think outside the box when it comes to complete dentures. Digital workflow manufacturing is another viable "tool in your arsenal" to provide your patients with consistent, high-quality removable dentures. It matters what type of teeth you use for traditional or digital manufacturing. Find out about the freedom in centric of the VITAPAN LINGOFORM posterior tooth set and the VITA VIONIC DIGITAL VIGO denture tooth library with the VITA VIONIC DENT DISC multiColor. Freedom is great!

The author is grateful to his patients, VITA Zahnfabrik, Aurum Lab Calgary, and especially, Jason Atwood.

# Digital solutions. VITA quality.



## VITA VIONIC® WAX For the fabrication of try-ins

Shades: white / pink  
Geometries: Ø 98.4 mm / H 30 mm



## VITA VIONIC® BASE DISC HI For the fabrication of denture bases

Shades: classic pink / classic pink translucent / soft pink / dark pink  
Geometries: Ø 98.5 mm / H 30 mm



## VITA VIONIC VIGO® Prefabricated denture teeth

Shades: VITA classical A1–D4®: A1, A2, A3, A3.5, B3, D3Bleach shade: 0M1  
Geometries: 8 x upper anterior and 4 x lower anterior tooth moulds, 4 x upper and lower posterior tooth moulds



## VITA VIONIC® DENT DISC multiColor For the fabrication of denture teeth

Shades: VITA classical A1–D4®:  
A1, A2, A3, A3.5, B1, B2, B3, C2, C3, D2, D3  
Bleach shade: 0M1  
Geometries: Ø 98.4 mm / H 20 mm



## VITA VIONIC® BOND Bonding

Packaging: VITA VIONIC BOND I (Dose, 2ml)  
VITA VIONIC BOND II (bottle, 1ml)  
Microbrush (3 Stk.)



## VITAVM® LC flow For sealing interdental spaces and for individualization

Shades: Available shades include five gingiva shades



## VITA AKZENT® LC Characterization

Recommended variants: white, cream, pink, dark-red, blue, Glaze



## Precision-fit premium teeth from the polychromatic disc

*Lukas Wichnalek, Norbert Wichnalek, Arbnor Saraci, Patricia Strimb Zahntechnik Wichnalek – HIGHFIELD.DESIGN, Augsburg, Germany*

Manually adjusting denture teeth to a model casting framework is tedious work that does not allow for true precision. There is a fair amount of guesswork involved, as it is ground out until it fits, and often more of the basal tooth is sacrificed than would have been necessary. With the digital workflow, innovative materials for removable partial dentures, which now enable custom-fit prosthetic components based on the lock-and-key principle, have been introduced. These only need to be bonded together using modern adhesive systems.

This means that high-precision production technology is replacing the guesswork of manual grinding. In the following, Norbert Wichnalek, Lukas Wichnalek, Patricia Strimb and Arbnor Saraci (all Zahntechnik Wichnalek – HIGHFIELD.DESIGN, Augsburg, Germany) show how the polychromatic VITA VIONIC DENT DISC multiColor is now being used to create precision-fit premium teeth in a digital workflow, and discuss the advantages this offers.

### Initial situation vs. final results





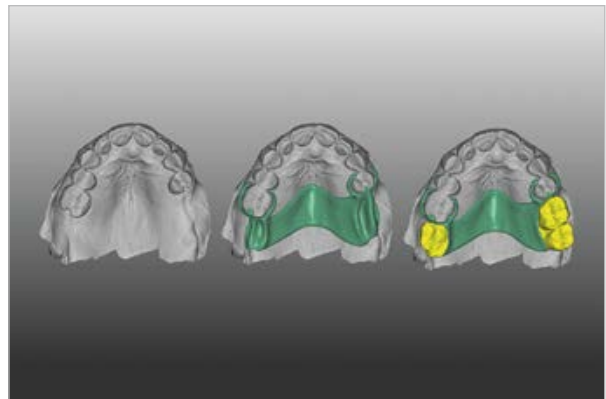
### A routine case

A patient in his early 60s presented at a dental practice for a routine visit. Teeth 17, 26 and 27 were missing in his upper jaw. Due to the free-end situation, mastication was limited. The patient also wanted the situation to be stabilized so that he could later be fitted with fixed implants. The dentures needed to be as inconspicuous as possible, be as comfortable as possible and not too expensive. The decision was made to use a clasp denture with a PEEK framework in order to avoid exposing any metal clasps, and to offer the desired level of comfort, thanks to its low weight. The tooth material on the

denture saddles was to be milled out of the VITA VIONIC DENT DISC multiColor in shade A3 with a precise fit. As with the proven VITA premium teeth, the polychromatic disc is based on the same VITA MRP composite formulation, ensuring high abrasion resistance and a long service life. The shade gradient integrated into the composite crown provides a basic natural appearance, which is why the material is also ideal for use in the anterior region.



The initial situation with the missing teeth 17, 26 and 27.



The design of the denture components in the exocad software.

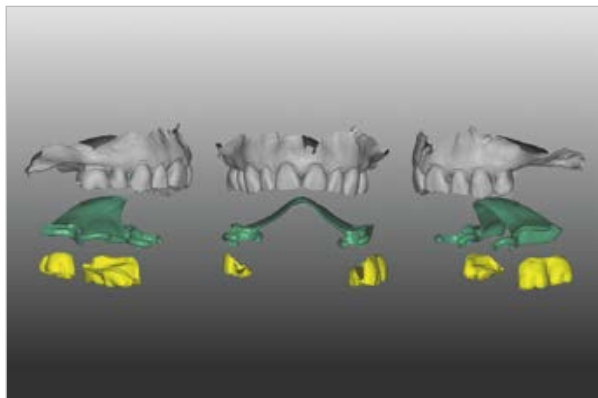
### Optimum adhesive gap and individual occlusion

After the intraoral scan of the dental arches and the habitual final bite position, the prosthetic components were designed to fit together precisely in the exocad software (exocad, Darmstadt, Germany). The framework structure was designed using Juvora Dental PEEK natural (Juvora, Lancashire, UK). The precision-fit tooth material from the VITA VIONIC DENT DISC multiColor then followed on the saddles, with the saddle base being incorporated into the design. Teeth 26 and 27 were also given an interlocking design, and the adhesive gap was kept even and

as small as possible to ensure the greatest possible stability. If the adhesive gap is too small, the bond will be weaker; if the adhesive gap is too large and inhomogeneous, this can result in chipping. It was possible to functionally design the occlusion to match the natural opposing dentition. Both prosthetic components were then fabricated one after the other in the imes-icore 350i PRO milling unit (imes-icore, Eiterfeld, Germany) with CAD/CAM support.



# Clasp Prosthesis.



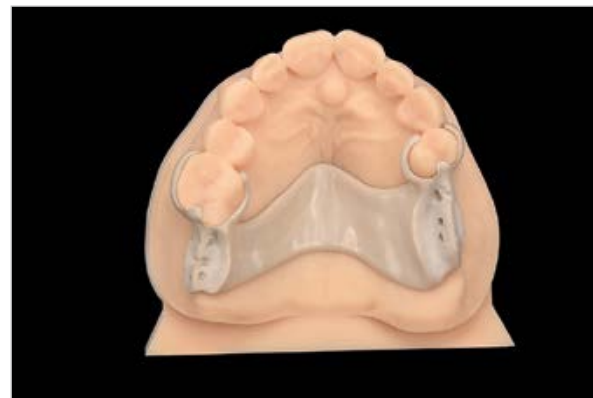
Individual elements for the clasp prosthesis.



The dental material fabricated with CAD/CAM support in VITA VIONIC DENT DISC multiColor.



Teeth 26 and 27 were produced with the basal parts interlocked.



The framework of the partial denture was fabricated from PEEK, supported by CAD/CAM.

## Elaboration and bonding

The tooth material was finished and the micromorphology determined using standard grinding tools. This was followed by a simple pre-polishing using the VITA ENAMIC Polishing Set technical and a short high-gloss polishing using VITA Polish Hybrid (both VITA Zahnfabrik, Bad Säckingen, Germany), as well as a brush with goat hair bristles and a leather buff. The basal adhesive surfaces of the prepared tooth material and the complete saddles made of PEEK were

first cleaned and conditioned in a vacuum plasma chamber – normal practice in our laboratory – using oxygen and argon as the ignition gas. Afterwards, conditioning was done with 50 µm aluminum oxide and the universal VITA VM LC Primer. This was followed by controlled adhesive cementation of the denture components using the cold-curing polymer resin VITA VM CC.



The precise fit of the tooth material on the saddles of the framework structure.



The tooth material was also used to mill basal parts from a single cast.



The individualized dental material made from the polychromatic composite disc VITA VIONIC DENT DISC multiColor.



Conditioning of the adhesive surfaces by sandblasting with 50 µm aluminum oxide.



The chemical bond of the prosthetic components was established using the universal VITA VM LC PRIMER.



The cold-curing polymer resin VITA VM CC was used for cementation

# Clasp Prosthesis.



The resulting excess material clearly shows the homogeneous adhesive gap.



Removal of excess using the microbrush.

## Gingival reproduction

The basal, vestibular and oral parts of the saddle were then completed with cold-curing resin. After sandblasting again with 50 µm aluminum oxide and conditioning the base with the VITA VM LC Primer, deeper blood vessels in the area of the mobile gingiva and in the interdental areas were established with the light-curing composite stain VITA AKZENT LC EFFECT STAINS dark-red (VITA Zahnfabrik, Bad Säckingen, Germany). After suitable fixation with the polymerization light, VITA VM

LC flow GINGIVA 4 (G4/brown-red) was used to create a thinly tapering mucosa, which also created a fine, definitive gingival margin around the teeth in the vestibular area, which was no longer subtractive as it progressed. After 90 seconds of intermediate curing, cervical and interdental contouring was performed with GINGIVA 1 (G1/dusky pink).

## Characterization and finishing

The palatal tooth and base areas from the VITA VIONIC DENT DISC multiColor were not individualized gingivally. To prevent an oxygen inhibition layer, final curing was carried out in 180 seconds using the Otoflash G171 polymerization device (NK Optik, Baierbrunn, Germany) in a wavelength range of 280-580 nm under an inert gas device with nitrogen. The entire saddle area was then washed off, sandblasted with 50 µm aluminum oxide, and the tooth material in the fissures and

interdentally characterized with the composite stains VITA AKZENT LC EFFECT STAINS russet and khaki. Finally, a uniform gloss level was established with a wafer-thin application of VITA AKZENT LC GLAZE. After another 90-second curing period – as described above – the high-gloss polish was applied with a cotton buff using light pressure.



A fine definitive gingival garland was created with VITA VM LC flow GINGIVA.



The gingival individualization of the saddle area was carried out with composite stains and castable veneering composite.

### Discussion and conclusion

The VITA VIONIC DENT DISC multiColor now makes it possible to create removable prosthetics with premium teeth from the disc individually, and as required. Only the dental material that is needed is produced with CAD/CAM support. The "guesswork" involved in the tedious and time-consuming process of grinding out prefabricated teeth is a thing of the past. The ability to fabricate interlocking and integrated parts of the base into the tooth material provides maximum durability. The optimized design of the adhesive gap also ensures stability and a reliable bond. The polychromatic VITA VIONIC DENT

DISC multiColor offers an inherently natural appearance, meaning that finishing and polishing are usually all it takes to achieve the desired esthetic effect. The basic shade accuracy of the composite shade to the VITA shade standards, in combination with the equally accurate and coordinated material components from VITA Zahnfabrik, provides true added value for fabricating removable partial dentures reliably and efficiently.



Occlusal view of the finished partial denture.



Occlusal view of the integrated partial denture.



## The advantages

### **Material quality.**

Abrasion resistant for durable denture teeth.

### **Esthetics.**

Integrated shade gradient for a more natural effect. Good polishing characteristics.

### **Flexibility.**

Simple, safe processing. Compatible with conventional milling systems.



# VITA VIONIC® DENT DISC multiColor

Composite milling blanks for tooth elements in final partial and full dentures.

## Available shades

12 x VITA classical A1–D4-/Bleach-shades:

0M1, A1, A2, A3, A3.5, B1\*, B2\*, B3, C1, C2\*, C3\*, C4, D2\*, D3

## Available geometry

Ø 98,4 mm / h 20 mm

## CAD technology partner for VITA Digital Prosthetics

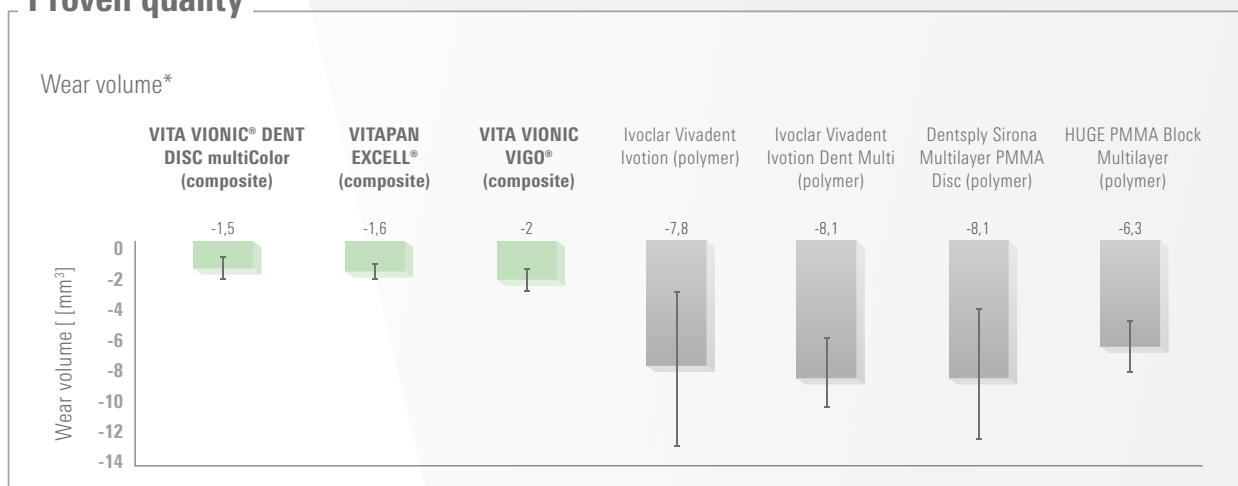
- exocad GmbH
- 3Shape A/S

## Validated for the systems:\*\*

- imes-icore GmbH (CORiTEC® one+, 150i series, 250i series, 350i series, 650i series)
- vhf camfacture AG (R5, S5, K5+, K5, E5)
- Dentsply Sirona (inLab MC X5)
- DGSHAPE/Roland DGA (DWX Line)

\*available first half of 2024 / \*\* Further validations are in progress

## Proven quality



\* Source: Regensburg University Hospital, Polyclinic for Dental Prosthetics, Report No. 2302\_02, 4/2023



## VITA VIONIC® DENT DISC multiColor

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