Nanoscale fiber strengthens composites

Result is described as stronger, longer-lasting — and with low shrinkage stress

NovaPro Flow, designed and created by Nanova Biomaterials, is the first commercial dental composite reinforced by nanofibers. The in-house made hydroxyapatite nanofibers, composed of calcium phosphate minerals, are the secret to NovaPro Flow’s high strength, great handling properties and esthetic effects, according to the company.

Teeth, bones and nanofibers have the same structure, all composed of a hard inorganic mineral in a soft organic matrix. For example, the enamel of a tooth is made up of high-volume, needle-like mineral crystals (approximately 15–20 nanometers thick and 1,000 nanometers long) in a small-volume, soft protein matrix. Bone and dentin are made up of plate-like crystals (approximately 2–4 nanometers thick and up to 100 nanometers long) embedded in a collagen-rich protein matrix. By comparison, the nanofibers have a thickness under 100 nanometers in diameter, or 1,000 times smaller than human hair.

Most dental composites comprise only nanoparticles, while NovaPro Flow reinforces the composites with nanofibers, adding several advantages. The strength found in the nanofibers is due to its one-dimensional nature and large surface area. If you apply a shear force to a bunch of nanoparticles, it is easier for the particles to slide by each other. A fiber, on the other hand, has a solid connection that is stronger to resist bending, shear and tensile forces. In comparison, synthetic bulk hydroxyapatite typically has a tensile strength of approximately 50 MPa, which would not be able to reinforce a dental composite.

The large size would also lead to polishing problems. The larger surface area of nanofibers provide better transfer of strength for the fiber and the dental composite alike.

During World War I, A. A. Griffith discovered the correlation between strength and the small size of ceramic materials, such as enamel, by testing different thicknesses of glass. According to the Griffith theory, these needle-like mineral crystals can reach their theoretical strength, or maximum strength, of a material (several or tens of GPa) when their diameters are in the nanoscale. Microscopic flaws cause a material to fail, so by creating a nanoscale fiber, statistically, it limits the amount of flaws and provides the ability to reach the material’s maximum strength. In addition, such mineral crystals at nanoscale are not sensitive to cracks or stress concentration, which typically degrades when produced on a micro or macro scale. The fibers are able to bend without breaking. The high strength and low sensitivity to cracks found in natural nanocomposites are the same advantages provided by the nanofiber reinforced NovaPro Flow.

(Source: Nanova Biomaterials)
“My personal journey at LVI taught me the most cutting edge techniques in dentistry. It taught me how important it is to work on my business and most of all to love what I do and provide my patients with life changing dentistry.”

Dr. Conchi M. Sanchez-Garcia, Miami, FL

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Rhein’83 OT Equator has reduced vertical profile of 2.1 mm and diameter of 4.4 mm

Rhein’83, a global producer of precision attachments on removable prosthesis, describes its OT Equator as the smallest dimensional attachment system on the market. It has a reduced vertical profile of 2.1 mm and diameter of 4.4 mm (metal housing included). It is compatible with any implant brand.

Superior stability
Because of its shape, Equator provides superior stability when compared with traditional attachments, according to the company. It corrects divergence of up to 25 degrees, the company reports. Functionality is guaranteed by coupling of attachment and cap.

Caps are available in four colors, based on levels of retention — from a minimum of 0.6 kg to a maximum of 2.7 kg.

Caps should always be used with metal housing.

Learn more
To learn more about OT Equator, you can contact the company by email at info@rhein83usa.it or by telephone at (877) 778-8383.

You can visit the company online at www.rhein83usa.com to learn more about all of its products and services, including the OT Equator.
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Dentatus ANEW is a different narrow-diameter implant for different challenges

Since inception in the 1990s, narrow-diameter implants have evolved from being used as transitional devices to a long-term solution for patients seeking less invasive and less time-consuming procedures. Dentatus ANEW is FDA-cleared for long-term use and backed by more than 10 years of clinical research.

Today, with proven reliable results, Dentatus ANEW implants are being used as an ideal option for single crowns with tight inter-proximal spaces. They can be placed in interdental spaces as narrow as 3.5 mm.

With changes in the health care environment calling for more affordable treatment options, particularly for the geriatric patient, now is an ideal time to incorporate narrow-body implants into your armamentarium.

Dentatus ANEW is the only narrow-body implant with a screw-retained prosthetic system, according to the company. It features various abutments for both immediate and long-term screw-retained single- or multi-unit prosthetics. The introduction of the Elypse abutment enables treatment for removable prosthesis with the DentureComfort technique.

Improves stability, stops rotation
Manufactured from a one-piece Grade-5 titanium alloy, Dentatus ANEW is available in 1.8, 2.2 and 2.4 mm narrow-body diameters. According to the company, the tapering implant design improves initial stability while the square platform prevents prosthetic rotation. The surface-treated thread promotes osseointegration, offering instant support.

For more information you can call (800) 323-3136 or visit www.DentatusUSA.com. You also can visit booth No. 314 at the AAP Annual Meeting or listen to Dr. Ziv Mazor’s co-presentation of the Focused Continuing Education course, FCE1: Narrow Diameter Implants,” on Sunday, Nov. 15, from 10:15-11:45 a.m.

(Source: Dentatus)

Temporary luting material delivers natural appearance

VOCO's Bifix Temp offers high esthetics with a simple application that provides users with visually pleasing results. The translucent and tooth-like universal shade blends with highly esthetic temporaries, does not shine through and promotes natural appearance of temporary restorations. Thanks to Bifix Temp's low film thickness, temporaries can be cemented to fit without adjustment.

As a composite-based dual-cure material, Bifix Temp offers 90 seconds of working time and sets in four minutes. The light-cure mode offers the user control and easy removal of excess material via a “tack-cure” technique that activates an initial elastic gel phase. Any unwanted residues are easy to locate and remove as Bifix Temp's universal shade stands out well against the gingiva.

Bifix Temp comes in an auto-mix syringe with very short tips, making application precise and economical. To learn more, you can visit www.voco.com.

(Source: VOCO America)

LVI Core I three-day course enables dentist and team to learn together

By Mark Duncan, DDS, FAGD, LVIF, DICOI, FICCMO, Clinical Director, LVI

As a patient, I expect the best care I can find. As a doctor, I want to deliver the best care possible. That takes us to the power of continuing education, and as doctors we are faced with many choices in continuing education.

As a way to introduce you to the Las Vegas Institute for Advanced Dental Studies, or LVI, I want to outline what LVI is about and what void it fills in your practice. The alumni who have completed programs at LVI were given their training at LVI. That alone is reason enough to go to LVI and find out more.

‘Advanced Functional Dentistry: The Power of Physiologic-Based Occlusion’

While the programs at LVI cover the breadth of dentistry, the most powerful and life-changing program is generally reported as Core I, ‘Advanced Functional Dentistry: The Power of Physiologic-Based Occlusion.’

This program is a three-day course that is designed for doctors and their teams to learn together about the power of getting their patients’ physiology on their side. In this program, doctors can learn how to start the process of taking control of their practice and start to enjoy the full benefits of owning their practice and providing high-quality dentistry.

Whether he or she works in a solo practice or in a group setting, every doctor can start the process of creating comprehensive care experiences for his or her patients.

We will discuss why some cases that doctors are asked by their patients to do are actually dangerous cases to restore cosmetically. We will discover the developmental science behind how unattractive smiles evolve and what cases may need the help of auxiliary health care professionals to get the patient feeling better.

The impact of musculoskeletal signs and symptoms will be explored and how the supporting soft tissue is the most important diagnostic tool you have — not simply the gingiva, but the entire soft-tissue support of the structures not just in the mouth but also in the rest of the body.

Comprehensive care
A successful restorative practice doesn’t need to be built on insurance reimbursement schedules. An independent business should stand not on the whims and distractions of a fee schedule but rather on the ideal benefits of comprehensive care balanced by the patients’ needs and desires.

Dentistry is a challenging and thankless business, but it doesn’t have to be. Through complete and comprehensive diagnosis, there is an amazing world of thank-yous and hugs and tears that our patients bring to us, but only when we can change their lives. The Core I program at LVI is the first step on that journey.

That’s why when you call, we will answer the phone, ‘LVI, where lives are changing daily!’