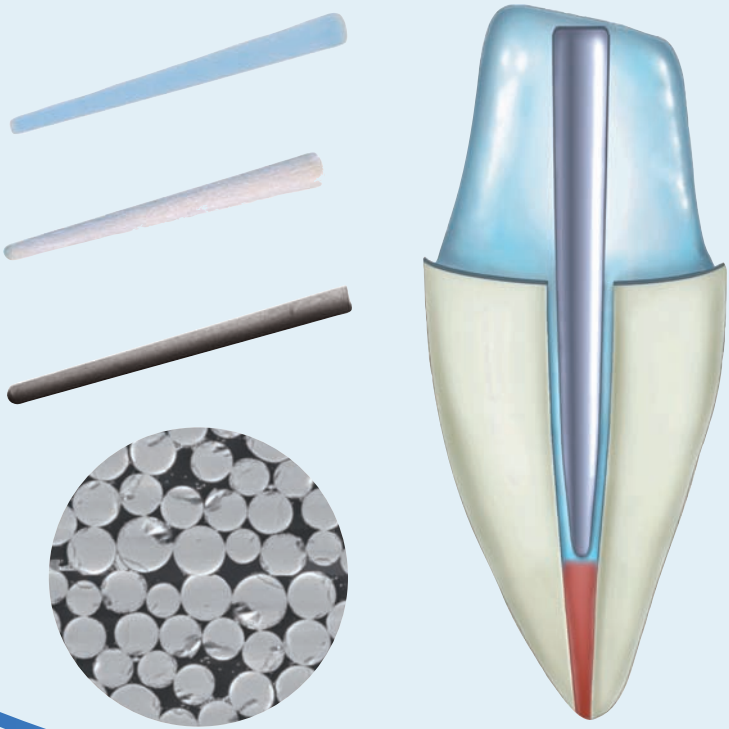
bioloren®
metal free dental solutions

20°
1998 - 2018

Fiber Posts

bioloren tutorial series



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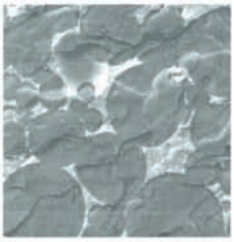
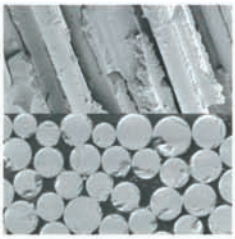
Bioloren - The company

Bioloren is a manufacturer company of dental materials, specialist in products made of fibres and composites. Bioloren projects an produces its "metal free dental systems". Bioloren quality systm has received ISO UNI EN 13485-2012. - Bioloren products are CE and ISO and FDA certified. Bioloren is owner of 7 patents.

Fibers in endontics

Fiber posts were introduced in 1989, they represented a revolution in dentistry because they have mechanical properties similar to ones of metals. Modulus of elasticity of carbon fiber was closer to modulus of elasticity of dentin than metal. This happened because fibre materials were isotropic. The sole limit of carbon fiber post was the color that was not ideal to aethestic restorations.

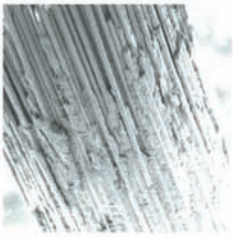




Material	MODULUS E (GPa)
Stainless steel	190 – 210
Titanium	115
Zirconium	200 - 230
Dentin	18.6
Carbon fiber	130 - 150
Glass fiber	30 - 50

Tab. 1 - Modulus of elasticity comparison

Aesthetic problem was solved with the introduction of glass fibres. They were white, resistant and with a modulus of elasticity similar to that of dentin. Glass fiber posts offer outstanding properties, high resistance to traction, absence of conductivity, no solubility, very low biochemical degradation. Thanks to these properties glass fibers posts have become a standard in endodontics.



Fiber post technology

Bioloren offers a large range of posts since the success of a reconstruction by fiber post can not depend on a single characteristic.

Fig.1 - Kit with reamers

Characteristics	Advantages
Modulus of elasticity similar to dentin	Absence of root fracture
Longitudinal fibers structures	Easy removal of the post from root canal
Absence of oxidation and corrosion	Stability of post fracture
Exceptional physic-mechanical properties	Enhanced adhesion
Cylindrical, conical, retentive and oval shape	Uniform distribution of stress and absence of periodontal traumas
Physic-chemical compatibility among post, cement, dentine and core	Creation of single tooth-post-restoration
Easy to use	Completion in one setting
Convenient price	Reduction in costs

Third generation fiber posts, besides good mechanical properties, are radiopaque too.

Fig.2 - Radiopacity of Bioloren posts

Bioloren has recently developed posts with high level of radiopacity. Among the range posts Bioloren produce detectable posts that are radio-detectable thanks to a patented radiopaque wire.

Bioloren produces 50 different types of fiber posts with a large range of shapes and diameters: from 0,8 to 2,2 mm. Among the peculiar characteristics of Bioloren posts, not considering the type of fiber, we put in evidence a good superficial micro-rugosity that increases the adhesion. All posts can be made of carbon fibers, white fiber glass and translucent material.

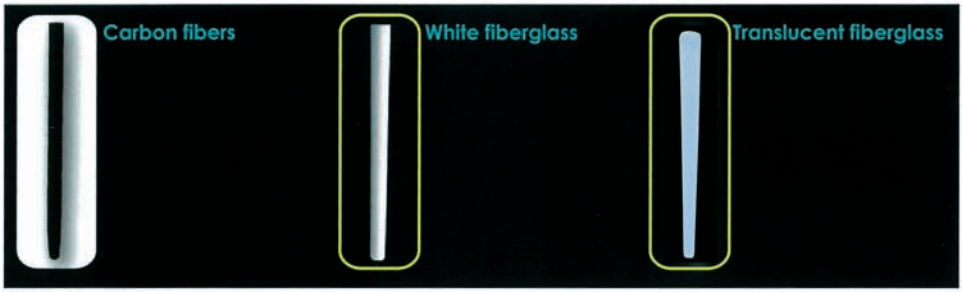


Fig.3 - Materials used for Bioloren fiber posts

Carbon fiber posts

Carbon fiber posts offers very high flexural strength, a good resilience and excellent adhesive characteristics to composite for reconstruction. The sole limit is aesthetic since they are dark. They are easy to retreat.

White fiber posts

White fiber posts have a very high flexural strength too, a very good resilience and excellent adhesive characteristics to composite for reconstruction. They have the advantage to be very aesthetic and as for carbon fiber ones they are easy to be retreated.

Translucent fiber posts

Translucent fiber posts show all physical – mechanical characteristics of previous posts and offer the advantage to favor root canal cementation thanks to feature to transmit the light of polymerization lamp deep to apex area. Aesthetic characteristic of translucent fibers make translucent posts ideal

Geometrical shapes of posts

Root canal post are recognized on the base of their geometrical shapes. The two classic types are: conical posts and cylindrical posts. Both have circular transversal section. Other type of posts produced by Bioloren are: oval or retentive.

Cylindrical (parallel) posts

Cylindrical posts produced by Bioloren have a diameter range from 0,8 mm to 2,2, mm. For each diameter Bioloren supplies the relative calibrated reamer. Cylindrical posts offer a very uniform retention along the whole axis of root canal.

Mechanical properties *

Modulus of elasticity	29 Gpa
Tensile strength	1.900 MPa
Flexural strength	1.400 MPa
Compression strength	360 MPa
Resilience (charpy test)	300 KJ/m²

***average values**

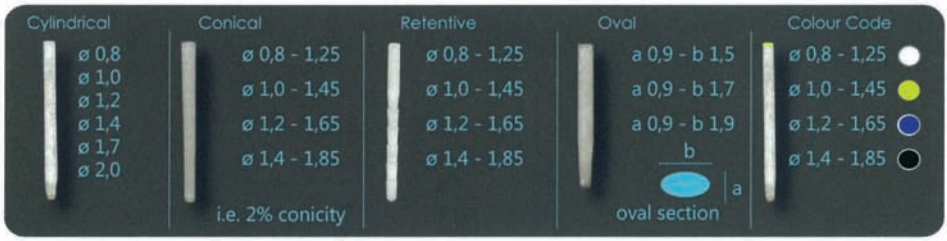


Fig.4 - geometrical shapes (examples)

Conical (tapered) posts

Conical posts are tapered in apex area, penetrate deeper into root canal and so they are more anatomical. Bioloren conical posts have a diameter range from 0,5 mm to 1,4 mm in apex area.
In coronal area there is a growing diameter according to chosen conicity. Bioloren produces posts with conicity from 2% to 10% and posts with double conicity.

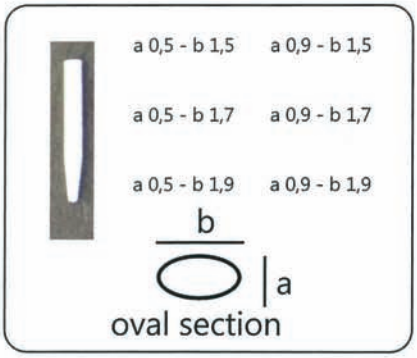


Fig.5 - Section of oval posts

Oval posts

Oval posts have been made to better adapt to anatomy of root canal that are oval. In this case an oval post results more appropriate and more conservative. The size of oval posts is characterized according to a axis and b axis. They can be used in case of canal preparation by ultrasonic instruments.

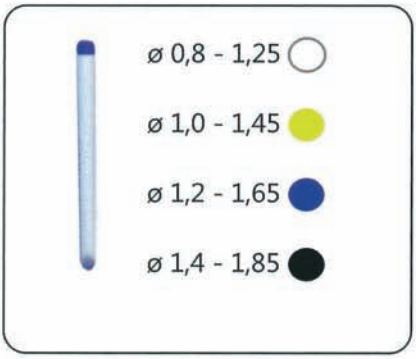


Fig.6 - Colour code posts

Color code posts

Color code posts are recognized because they have a colored head and the color depends on the size. This system permits to immediately recognize post diameter and the calibrated reamer.

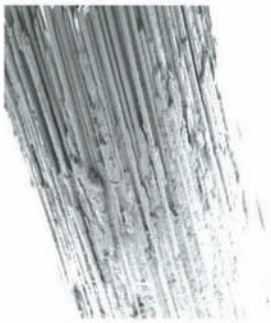


Fig.7 - Long fibers in resin matrix

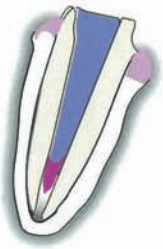
Superficial roughness

External surface of post, if observed at SEM, is not perfectly smooth and it will never be since it is a surface that is treated by the right instruments. The remained roughness, produced by tooling machines, is an advantage from the point of composite adhesion. Bioloren fiber posts show micro-roughness of 2 - 5 micron making the grip of adhesive and composite easier since this roughness increases surface contact of 30-40%.

Cementation by adhesive technique

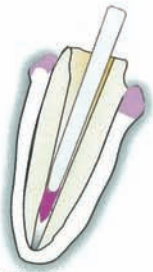
1 - Root canal preparation.

2 - Disinfection of the root canal.

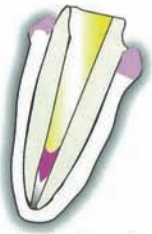


3 - Etching.

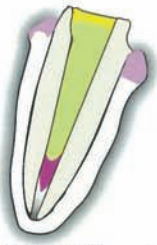
4 - Cleaning and washing.



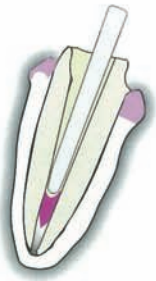
5 - Post fitting.



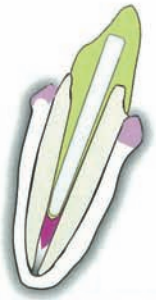
6 - Apply adhesive.



7 - Insert cement.



8 - Insert post



9 - Core build up

10 - Complete case with crown.

Advices:

Step **2** use EDTA(at 17%) and then Sodium hypochlorite

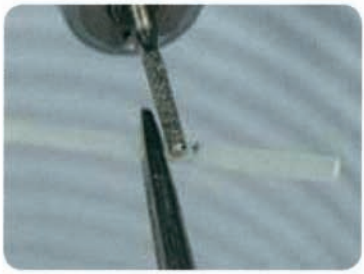
Step **3** etching with phosphoric acid solution (38%).

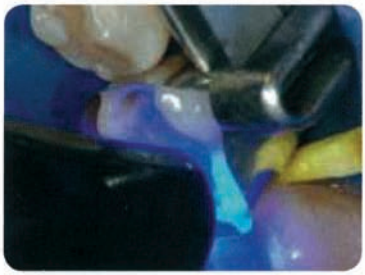
Spep **4** do not dehydrate.

Cementation technique by photos

In this clinical case we show a reconstruction by use of translucent conical fibre post. This permits the polymerization light to go deeply and reach the apex area too. During endodontic reconstruction is mandatory to isolate the area using a rubber dam. It is important to pay attention during the steps of dentin wall preparation. Both post cementation and core build up are made by using a dual cure cement (URC Bioloren).









Key points for success

- Calibrated reamers for posts
- Cements for root canal posts

Calibrated reamers for posts.

For the last step of canal preparation it is suggested the use of calibrated (Conical of cylindrical) to use with relative post shape and size. These reamers act on the sizes of the root canal and not on the head. Biolore produces reamers too.

Fig.8 - Cylindrical reamer

Fig.9 - Conical reamer

Cements for root canal posts.

Cements for root canal posts have to be dual (light and self-curing). This permits a better cementation of post since after the step of polymerization using lamp, the hardening process of cement continues as self curing. Another important characteristic is the fluidity, a cement for fiber post has to be flowable to soak completely both post and tooth.

Fig.10 - URC (Universal resin cement)

It is important that a resin cement can be used for build up. In this way it is not necessary to use different materials and it is certain the possibility to obtain a monobloc. We recommend to use a cement that releases fluoride and it is radiopaque. The color of Bioloren URC (Universal Resin Cement) is A2. In order to cement posts, Bioloren suggests to use an adhesive system composed by: AD + mono (single step adhesive), together with AD+ activator and URC in automix syringe.

Removal of residues from the canal

Before cementing posts it is important a correct canal preparation: clean the root canal by all (residues) of former treatments, prepare canal walls for a better adhesion. Remove all organic (smear layer) and inorganic waste remained into the canal. This step is carried out by EDTA 17% (chelant agent), then in order to remove organic waste we recommend to use Sodium Hypoclorite, clorexidina, H2O2 or similar products.

Canal wall preparation

The last step to remove smear layer is to use etching gel like orthofosforic acid. When finished chemical / mechanical preparation, in other words, when it is certain there is no waste in canal, including eugenol waste, there is the step of washing and drying using paper cones and light air blows. However the canal has to remain humid and not completely dry in order to improve adhesion to collagen fibers.

Use of cement and adhesive

For cementation we recommend dual cement. Apply cement by a lentulo or another system to favor the creation of a monobloc through mechanical and chemical retention in the part that adheres to the post. It is important to say that cement needs to be flowable to penetrate by few microns inside dental tubules and create tags. We suggest to use enamel dental adhesive to improve adhesive effect of resin cement.

Fig.11 - Adhesive system ad+

"ad+" Adhesive system

-Ad+ mono in 6 ml bottle and ad-activator in 3 ml bottle.

Ferule effect

In case of teeth strongly de-crowned it is necessary, before making the restoration, to create a surface for supporting the residual part of dentin. Without this, the forces in the mouth will compromise th reconstruction over time.

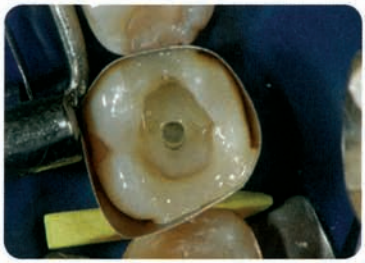


Fig.12 - Ferule effect, view from above

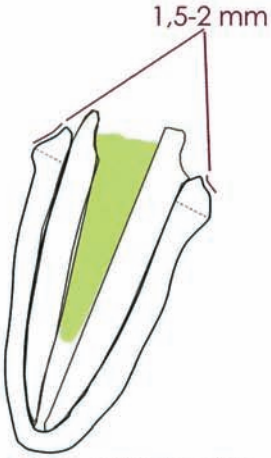


Fig.13 - Ferule effect, vertical section

Most frequent reasons of failure:

1) micro-breakages
The creation of micro breakages of dentin, not easy to see, can compromise the restora restoration during the time.

2) deterioration of seal
The seal created during canal treatment can deteriorate over time. In that case bacteria can settle in the restoration.

3) de-cementation.
Post de-cementation in many cases is due to:

- choice of not right adhesive or cement;
- presence of residues of eugenol;
- panal too dry;
- uncompleted removal of smear layer;
- discrepancy between post diameter and canal diameter;
- lack of ferule.

An answer for all needs

Bioloren research focuses on micro invasive reconstruction protocols in order to save the most possible part of dental tissues and so it has developed a large range of shapes and sizes to answer all these needs using high quality materials.

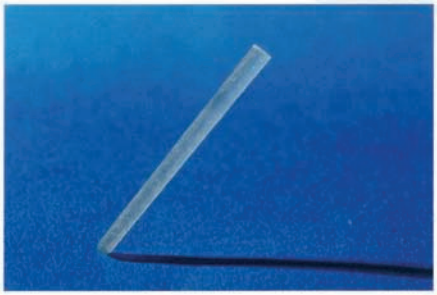


Fig.14 - Translucent Post

Tailored packaging

Bioloren answers to all needs of purchase from customers offering a complete and tailored pack:

- Kit of different sizes with or without reamers;
- Refill with or without reamers;
- Calibrated reamer for each size (cylindrical or conical).
- Dual cement and adhesives.

Fig.15 - Translucent Post - refill 10 pcs

Bioloren offer

Fiberglass white posts

Shape	Diameter(mm)
Conical	ø 0,8 - 1,25 ø 1,0 - 1,45 ø 1,2 - 1,65 ø 1,4 - 1,85
Cylindrical	ø 0,8 ø 1,0 ø 1,2 ø 1,4 ø 1,7 ø 2,0

Translucent Fiberglass posts

Shape	Diameter(mm)
Conical	ø 0,8 - 1,25 ø 1,0 - 1,45 ø 1,2 - 1,65 ø 1,4 - 1,85
Cilindrical	ø 0,8 ø 1,0 ø 1,2 ø 1,4 ø 1,7 ø 2,0
Retentive	ø 0,8 - 1,25 ø 1,0 - 1,45 ø 1,2 - 1,65 ø 1,4 - 1,85
Oval	a 0,9 - b 1,5 a 0,9 - b 1,7 a 0,9 - b 1,9

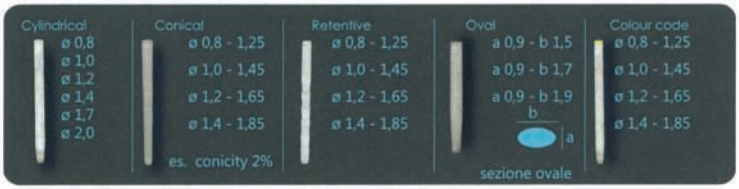
Length of the posts

Bioloren posts are usually 21 mm long. However upon request it is possible to produce posts with other lengths. Oval posts sold by Bioloren are 18 mm long.

Conicity of the posts

Conical posts have a standard side conical declivity of 2%, or 4%, 5%, 6% and also 10%.

posts dimensions.



Retentive posts

Retentive posts by Bioloren are characterized by trasversal grooves to post axis. These grooves have retentive properties because of geometrical effect in addition to those created by the micro roughness of the surface.

Oval posts

These posts are highly anatomic and adapt to different sizes of canal. They have the first axis of steady dimension and the canal opening width.

Carbon Fiber posts

The range of carbo fiber posts is the same of white or translucent post.

SPECIAL POSTS

The most technologically advanced posts for a safe and long-term reconstruction

Bioloren special posts are cementable connections (no screws). The wide range permits the dentist to choose the most suitable model for any clinical case. Ideal for recovering to broken or failed implants, prosthetic anchorage, permanent or long term meso-structures. These anchor posts are used in case of fully or partially damaged tooth crown. Depending on post model the method allows to use metal-ceramic crown or immediate building of composite crown directly by dentist bypassing the laboratory.

Monocore is a fiberglass post made of an upper part (abutment side) and a lower conical part (post side).
The upper part is easily reshaped with a diamond bur for a quick reconstruction. The lower part can be inserted in a root canal or in an implant and is self-threading. Monocore satisfies the needs of a correct reconstruction of devitalized teeth with serious coronal damage. Besides endontontics, monocore can be used in implantology too in case of failed implants as a cemented abutment.

- Micro-rough surface.
- Available in two sizes: small and large
- The fastest solution for core build-up
- Monocore permits to save cement reducing the number of layers of cement as half of the core build up is already made
- Monocore can be used jointly with another monocore in the molar reconstruction in case of pluriroots.

Adapt Post is a fiberglass post made of an upper part (abutment side) and a lower conical part (post side).
The upper part is easily reshaped with a diamond bur for a quick reconstruction.
The lower part can be inserted in a root canal or in an implant and is self-threading.
Micro-rough surface. Thanks to its big abutment part Adapt post can be used for angled implants too

Fit Post is a fiberglass post made of an upper part (abutment side) and a lower conical part (post side).
The upper part is easily reshaped with a diamond bur for a quick reconstruction.
The lower part can be inserted in a root canal or in an implant.
Micro-rough surface. Thanks to its chamfer shape Fit post can be used with the majority of implants.

Post Ball is a white fiberglass conical Post for reconstruction. Radiopaque.
Micro-rough surface.
It is provided together with a small cap to connect the ball-side.
Post ball can be used during the process of creation dentures and bars on implants like the ones from Trilor discs or Trilor arch, cutting a post and cement the post ball on the framework.
Post ball is ideal for anchorage of removable prosthesis. The particular structure of the techno-polymer avoids the ball to become oval. It is compatible with all caps with diameter 1,8 and 2,5 mm

Bicore is made of two separate parts: a post part and a stump part. It offers very good aesthetic results in case of direct restorations or prosthetic crown. It has a better capacity to absorb forces.

OUR COMPANY

BIOLOREN is an innovative Italian company specializing in "Metal free" dental systems.

The company was founded in 1998 and has since focused on the manufacture of cutting-edge dental products.

Over the years the company has earned a considerable reputation as a producer of fiber posts sold in more than 40 countries.

The quality system of BIOLOREN is certified UNI CEI EN ISO 13485. All the products by BIOLOREN are certified CE and many of them also received the prestigious American FDA.

BIOLOREN uses high quality materials and co-operates with important universities both in Italy and abroad.

BIOLOREN offers different product lines:

- Fiber posts
- Fiber ribbons
- Trilor® discs and blocks for CAD/CAM machines and Trilor® Arch for manual use.
- URC Universal resinous Cement + Adhesive system AD+

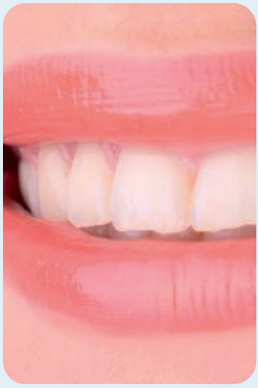
The products are designed and manufactured by BIOLOREN which owns patents for many of them.

In particular, the research team specializes in the development of fiberglass, carbon and polyethylene products.

BIOLOREN provides metal free solutions to meet the needs of all dentists and dental technicians.

The company distributes worldwide through a network of distributors.

bioloren®
metal free dental solutions



Bioloren S.r.l.
Via Alessandro Volta, 59
21047 Saronno (VA), Italy
Tel/Fax: +39 02 96703261

info@bioloren.com
www.bioloren.com

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