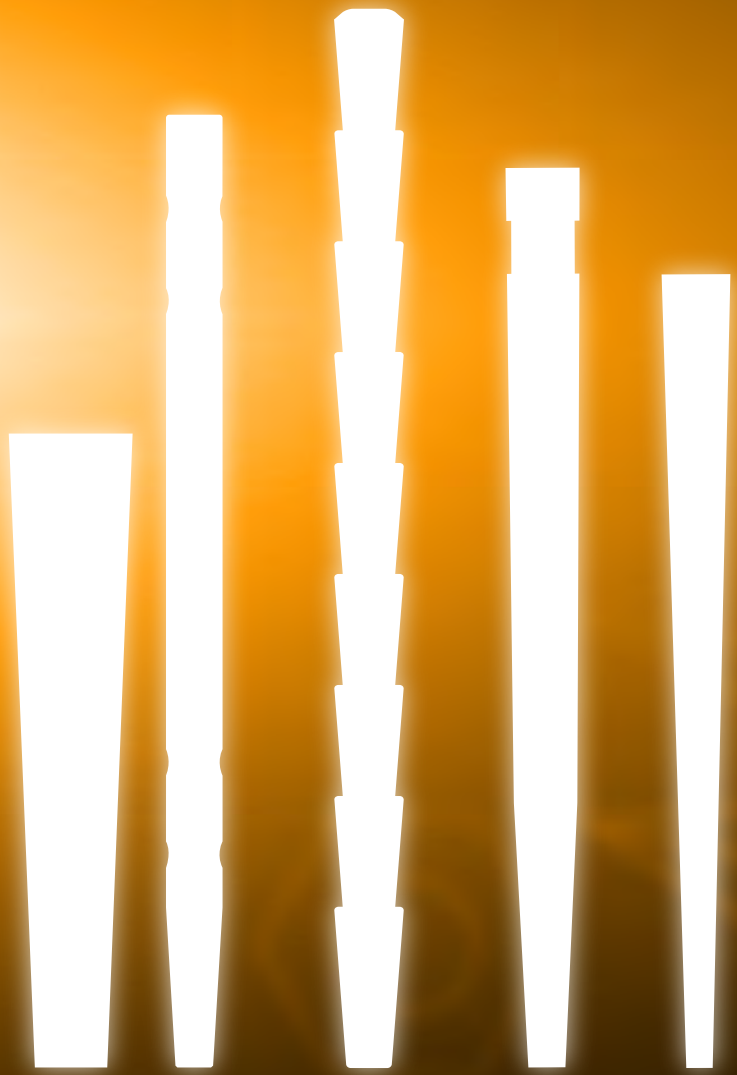
Scientific Technical Profile

ENG

Fiber posts

Fiber +

ProDentis



angelus®

Contents

INTRODUCTION

Over the past two decades, composites reinforced with fibers, especially fiber posts, have earned a special distinction in the global dental market.

The use of posts on endodontically treated teeth to serve as support for fixed prostheses has been a great challenge for Dentistry, due mainly to the condition of lower mechanical strength of these teeth when compared to vital teeth.

The post should serve as support for the future prosthesis or restoration, without causing stress and, consequently, without causing fracture of the root. Therefore, the importance of the use of posts with mechanical properties similar to tooth structures is evident.

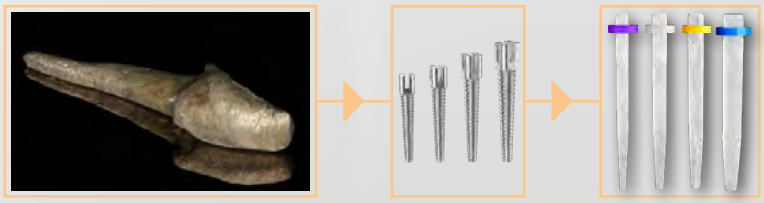
Good mechanical properties of fibers, in combination with the ease of use and aesthetics of the glass fibers, mean that fiber posts, day after day, are taking the place of cast metal posts.

With the advent of adhesive cementation, these posts have earned an even greater distinction, because their composition favors this type of cementation, since the fiber-resin structure, unlike that of metal posts, has adhesion to the dental structure and restorative materials.

Among all the benefits of fiber posts, its elastic modulus, which is very close to that of the dentin, and the reduction in the occurrence of catastrophic fractures in endodontically treated teeth are those which have caught the most attention from the scientific and clinical community.

At the time it entered the market, it was very common to hear that when a fiber post was used, the dentist would be putting dentin in place of dentin.

Evolution of the posts



HISTORY OF POSTS

The first crown-root reconstitution described seems to have been of metal, of Japanese origin, during the Middle Ages. It initiated the era of pivot teeth.

A very long period ensued, in which various attempts were made to retain the teeth.

Pierre Fauchard, in 1728, used a type of wooden post, in order to retain the crowns.

In 1880, another device created was the Richmond crown, which was a threaded tube inside the canal, which allowed for placement of a crown using a screw device.

The first author to address the retention of posts was Burgorem, in 1917.

Metal was used for this purpose for a long period, despite having some disadvantages, such as corrosion, perceptible post/tooth interface, discontinuity of the tooth/prosthetic joint, non-adhesion to the reconstruction materials, difficulties in endodontic retreatment, costs, etc.

Non-metallic materials arose from the need to resolve these shortcomings, as well as to obtain important aesthetic characteristics necessary for creating metal-free prostheses.

Resin composites, with their low elastic modulus, marked a decisive change in the concept of corono-radicular reconstitutions.

It was necessary to find a material that approximated the characteristics of the tissue over which it would be placed. Then came the idea of placing fibers inside an organic matrix, presented by Woo, in 1974.

In 1984, the idea of using materials with physical/mechanical properties close to those of the dental structure became a necessity.

In 1987, the Lyon School, concerned with intra oral corrosion, set out to make fixed prostheses of resin with the inclusion of carbon fibers, to increase the mechanical values.

With that began a new era in Dentistry, with studies that developed the current non-metallic pre-fabricated intra-radicular posts.

These posts, in addition to all the characteristics planned for their use in relation to the mechanical properties, provide a better load distribution, requiring the minimum possible from the dental structures, presenting a lower rate of root fractures. This is also obtained because these posts require less removal of the dental structure, since the opening method is quite rational and does not destroy the remaining tissues.

In non-metallic intra-radicular posts with fiber reinforcement, the reinforcement is from continuous, unidirectional fibers, and the matrix is an epoxy resin that supports the reinforcement.

The characteristics of glass fiber-based posts are: good translucency, which allows for better aesthetic qualities, high resistance to fatigue and flexure, and an elastic modulus very close to that of the dentin. Endodontic retreatment is a factor that we should consider. The structure of the core (longitudinal fibers along its axis) allows retreatments without difficulty. It is sufficient to use a drill of a diameter smaller than the axis of the post.

The orientation and arrangement of the fibers guide the drill, and the post will be destroyed within minutes, without affecting the intraradicular dentin.

Find out a little more about fibers

1. When did glass fibers emerge?

The history of glass fibers began in 1836, when a method of weaving malleable glass was patented in Europe. Starting in 1940, the development of synthetic resins promoted wide use for this type of fiber and its applications opened up a wide variety of markets.

2. What are the advantages of glass fiber?

When compared with other similar products, it has excellent resistance and rigidity for its density, it is easy to use, it is a light material, it is easy to repair, it has good corrosion resistance and great abrasion resistance.

3. In what areas are glass fibers used?

They are used in the aerospace industry, for manufacture of structures resistance to wide ranges of pressure levels and temperature; in the naval industry, for construction of ships with structures that do not oxidize in contact with water; in the automobile industry, for construction of structures that absorb impacts in case of accidents; and in the sports industry, in production of light materials with elasticity to resist fractures.

4. Use of Glass Fibers in Dentistry

As mentioned, the fibers have important characteristics

that also make them ideal in obtaining materials for Dentistry. They are used in the creation of intra-radicular posts, structures of fixed prostheses, and periodontal containments.

They provide materials that are resistant to the impact of masticatory forces, light enough not to cause discomfort to the patient, and they do not undergo oxidation like metals do, causing a metallic taste. They are elastic, allowing for significant bending without breaking, thus avoiding root fractures commonly observed with the use of more rigid materials in the creation of posts, such as metal.

Inside the posts

Description

Splendor-SAP
Parallel post and tapered sleeve.

To fill in all kinds of canals.

Exacto
Tapered post, with double taper.

Double taper: for better fit in tapered canals.

Reforpost®
Parallel post with tapered apex, serrated.

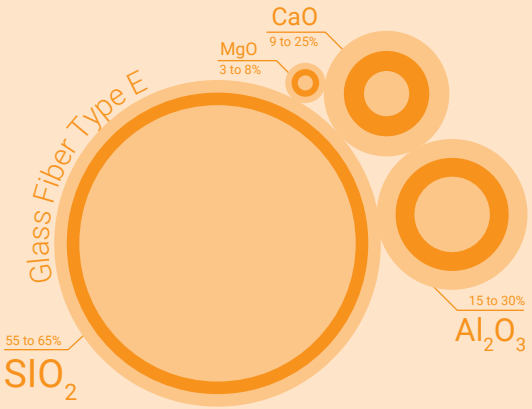
Tapered apex: in order not to weaken the apical portion of the canal.

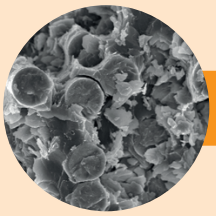
Reforpin®
Pointed, smooth taper.

Pointed: to fill the entire canal.

Composition

Splendor-SAP	Glass Fiber Type E, Pigmented Epoxy Resin
Exacto	Glass Fiber Type E, Pigmented Epoxy Resin
Reforpost® Glass Fiber	Glass Fiber Type E, Pigmented Epoxy Resin and Stainless Steel Filament
Reforpost® Carbon Fiber	Fibra de Carbono, Pigmented Epoxy Resin and Stainless Steel Filament
Reforpin	Glass Fiber Type E, Pigmented Epoxy Resin



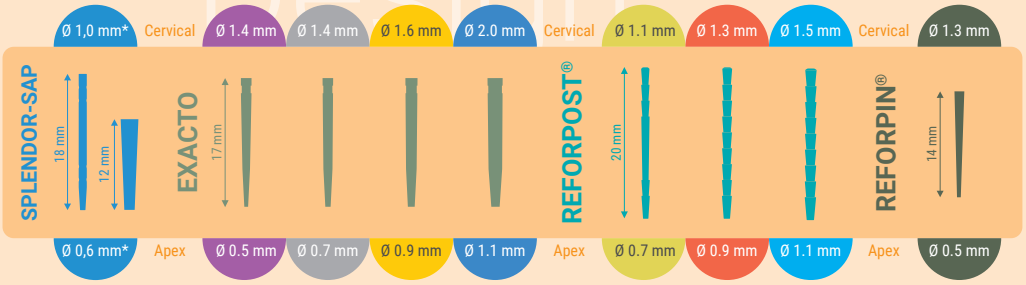


Microscopic view of the **Fiber Post**

Design

Treatment of the post

1. Clean the post with alcohol**
2. Apply Angelus® Silane* and wait 1 minute**
3. Apply the chemical adhesive



Treatment of the canal

1. Etch with Angelus® 37% Phosphoric Acid
2. Wash with water and dry with absorbent paper cones**
3. Apply the adhesive system according to the manufacturer's instructions for use.

Cementation

1. Cement with cement chemical resin or dual**

*only for cementation of fiberglass posts
**For use with self-adhesive cement, do only these indicated procedures.

Cementation

Presentations

Splendor-SAP

6254	**Kit** - 5 posts, 5 gloves and 1 bur
6255	**Refill** - 1 post and 1 sleeve
6258	**Refill** - 5 posts and 5 sleeves
6253	**Refill Bur** - 1 bur

Exacto

9087	**Trial Kit 0.5** - 5 posts and 1 bur nº 0.5
9117	**Trial Kit 1** - 5 posts and 1 bur nº 1
9127	**Trial Kit 2** - 5 posts and 1 bur nº 2
9137	**Trial Kit 3** - 5 posts and 1 bur nº 3
9147	**Kit** - 15 posts (5 nº 1, 5 nº 2 and 5 nº 3) and 3 burs (1 nº 1, 1 nº 2 e 1 nº 3)
9097	**Refill 0.5** - 5 posts
9157	**Refill 1** - 5 posts
9167	**Refill 2** - 5 posts
9177	**Refill 3** - 5 posts

Reforpost®

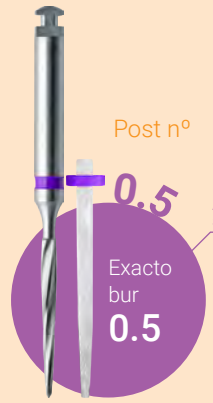
711	**Carbon Fiber Refill nº 1** - 5 posts
712	**Carbon Fiber Refill nº 2** - 5 posts
713	**Carbon Fiber Refill nº 3** - 5 posts
720	**Glass Fiber Kit** - 30 posts (10 nº1, 10 nº2 and 10 nº3), 3 Largo burs (1 nº3, 1 nº4 and 1 nº5) and 1 radiographic guide
721	**Glass Fiber Refill nº 1** - 5 posts
722	**Glass Fiber Refill nº 2** - 5 posts
723	**Glass Fiber Refill nº 3** - 5 posts
724	**Glass Fiber Mini kit** - 15 posts (5 nº 1, 5 nº 2 e 5 nº 3) and 1 radiographic guide
726	**Glass Fiber Refill nº 1** - 10 posts
727	**Glass Fiber Refill nº 2** - 10 posts
728	**Glass Fiber Refill nº 3** - 10 posts

Reforpin®

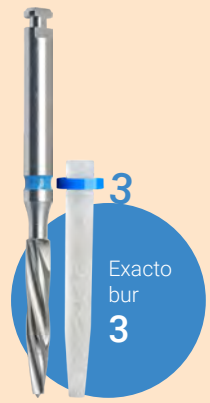
796	**Universal size** - 5 units
797	**Universal size** - 10 units

Exacto

Post nº



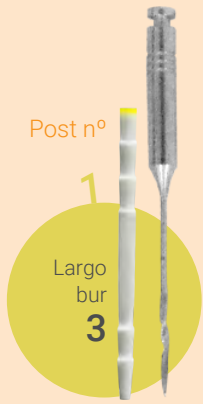
Also in more atresic channels.

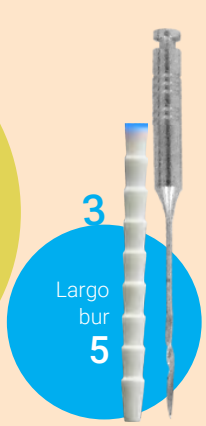


Reforpost®

Glass or carbon* fiber

Post nº

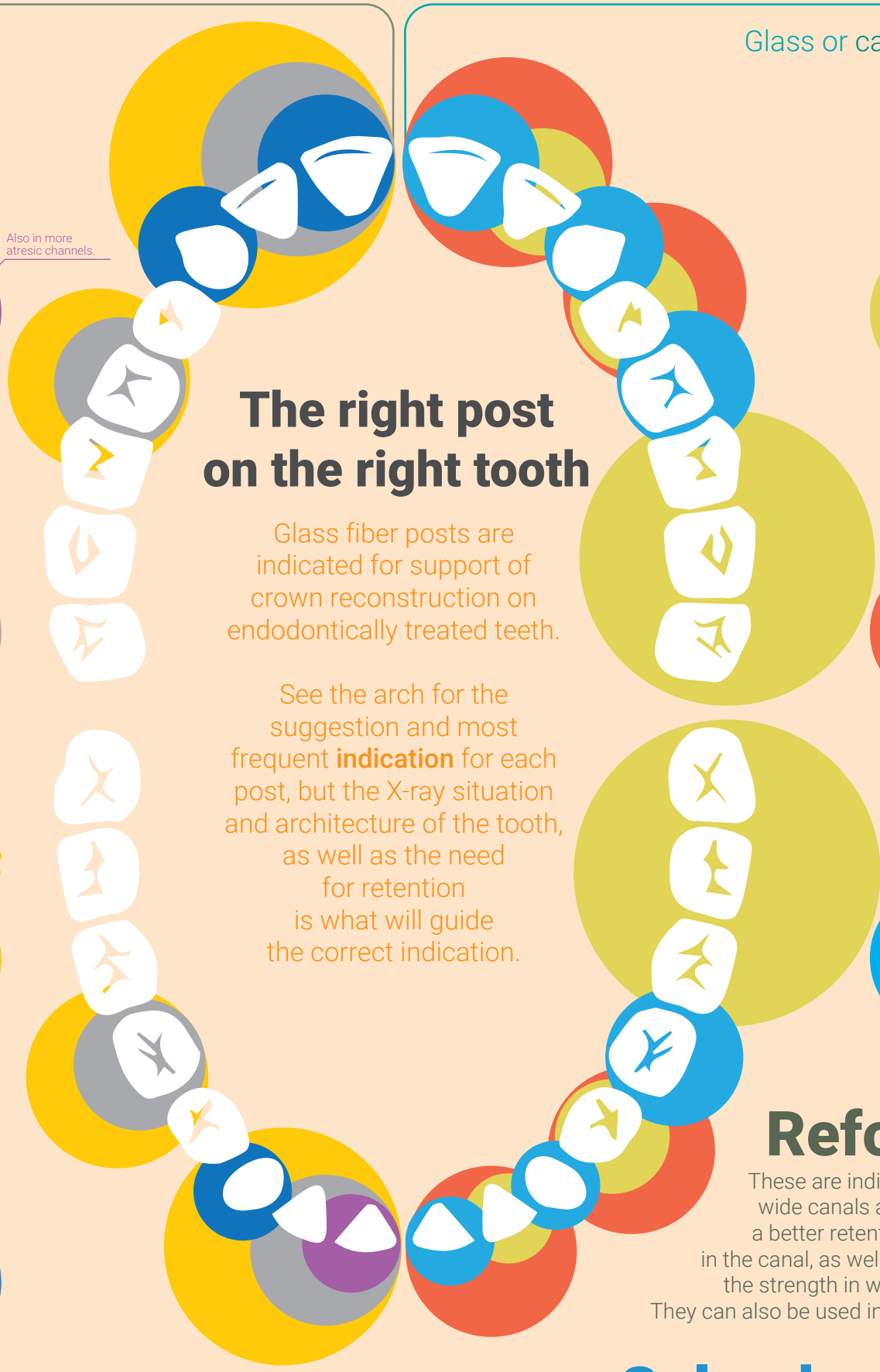




The right post on the right tooth

Glass fiber posts are indicated for support of crown reconstruction on endodontically treated teeth.

See the arch for the suggestion and most frequent **indication** for each post, but the X-ray situation and architecture of the tooth, as well as the need for retention is what will guide the correct indication.



Fit your X-ray to one of the spaces below and verify which is the best post for your case. Use the radiographic guides and find out which type of post best suits your case.

Reforpin®

These are indicated for filling wide canals and performing a better retention of the post in the canal, as well as to increase the strength in weakened roots. They can also be used in atretic canals.

Splendor-SAP

Indicated for all dimensions of canals.

*On teeth where the aesthetics may be compromised by the color of the post, it is recommended to apply an opacifier (OPAK from Angelus®)

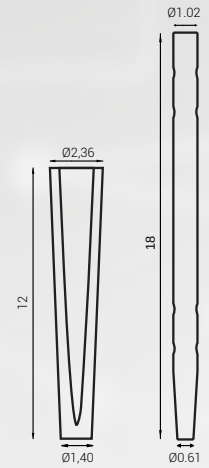
Exacto

Reforpost®

*The radiographic guides are in the Exacto Kit (Ref. 9147) and Reforpost® Glass Fiber Kits (Ref. 720 and 724)

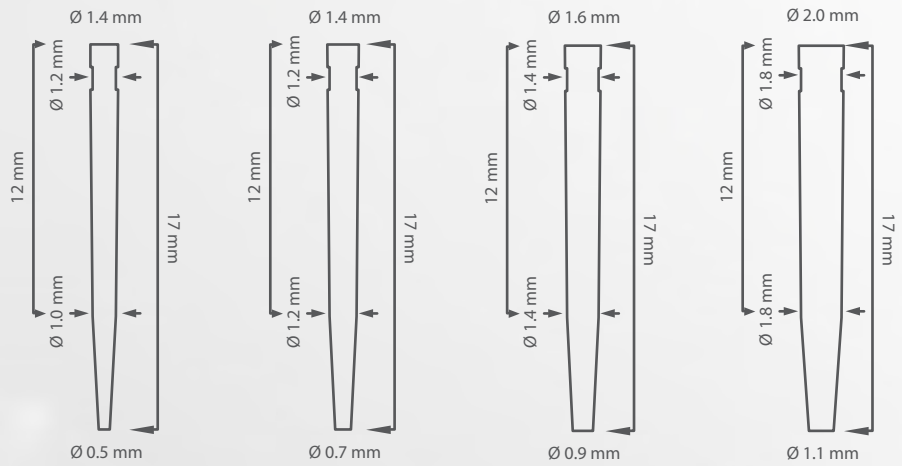
Measurements (3:1 Scale)

Splendor-SAP



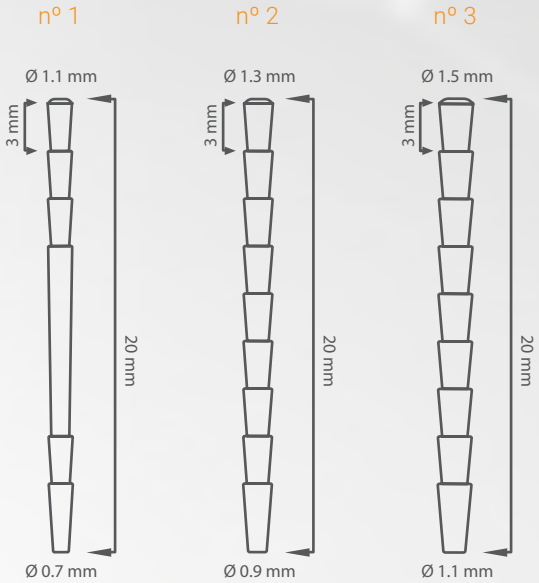
	Length Total (mm)	ø Apex (mm)	ø Body (mm)	ø Top (mm)	Taper (mm/mm)
Post	18.0	0.65	1.0	1.0	-
Sleeve	12.0	1.4	-	2.4	0.08

Exacto



		Exacto nº 0.5	Exacto nº 1	Exacto nº 2	Exacto nº 3
Cervical diameter		1.4 mm	1.4 mm	1.6 mm	2.0 mm
Apical diameter		0.5 mm	0.7 mm	0.9 mm	1.1 mm
Taper ratio	Taper 1	0.03	0.03	0.03	0.05
	Taper 2	0.10	0.10	0.10	0.10
Total length		17 mm	17 mm	17 mm	17 mm

Reforpost® Glass or Carbon Fiber



	Reforpost® nº 1	Reforpost® nº 2	Reforpost® nº 3
Cervical diameter	1.1 mm	1.3 mm	1.5 mm
Apical diameter	0.7 mm	0.9 mm	1.1 mm
Total length	20 mm	20 mm	20 mm

Reforpin®

	Tamanho universal
Cervical diameter	1.1 mm
Apical diameter	0.5 mm
Total length	14 mm

BUR
(2:1 Scale)

For Reforpost®
Glass or Carbon Fiber
nº 1

Use Bur
nº 3

For Reforpost®
Glass or Carbon Fiber
nº 2

Use Bur
nº 4

For Reforpost®
Glass or Carbon Fiber
nº 3

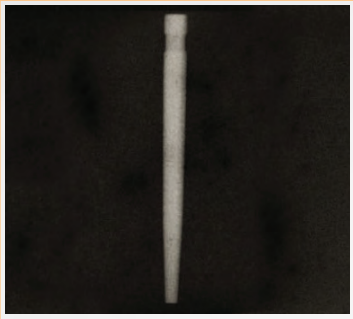
Use Bur
nº 5

Radiopacity

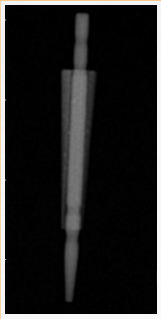
Fiber posts have lower radiopacity than metal. However, Reforpost® posts have a stainless steel filament inside that allows for radiographic viewing.

Exacto and Splendor-SAP posts have radiopacity due to the incorporation of a radiopacifier in their resin matrix.

Reforpost®



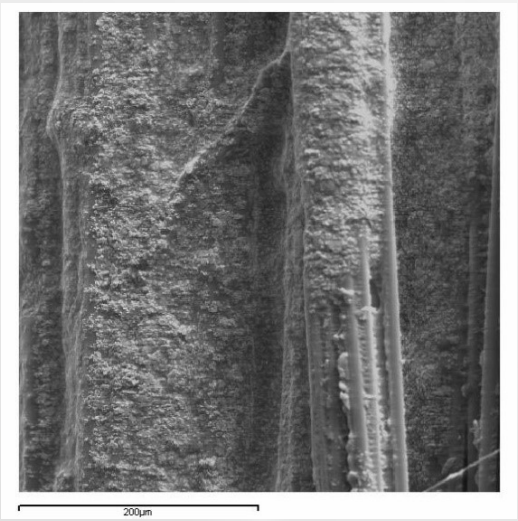
Exacto



Splendor-SAP

Arrangement of the fibers

The fibers are inside a longitudinally arranged resin matrix, which ensures their high resistance to fracture under normal physiological conditions.



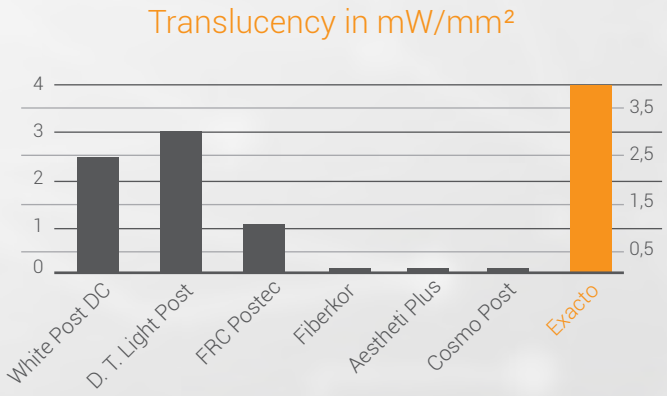
Micrography: Fibers inside the resin matrix arranged longitudinally

Translucency

The translucency of fiber posts is a very controversial issue in the literature. Various studies have shown that the use of translucent glass fiber posts is favorable for the best aesthetic quality of the restoration.

The scientific studies show us that the idea that a translucent posts helps in the curing of resin cements is not correct. Glass fibers, despite being light transmitters, do not allow enough light energy for the complete curing of resin cements in the medial and apical areas of the canals, which can lead to unsuccessful cementation.

Exacto posts have the translucency needed for the favorable aesthetic reproduction of the restorations. The use of innovative fibers in combination with an appropriate polymer matrix confers translucency to the post and highly attractive aesthetic properties to the final restoration.



(MORGAN, L.F.S.A.; PEIXOTO,R.T.R.C; ALBUQUERQUE, R,C.; CORREA, M.F.S.C; POLETO, L.T.A.; PINOTTI, M.B..; Light Transmission through a Translucent Fiber Post. Volume 34, Issue 3, Pages 299-302, March 2008.)

MECHANICAL PROPERTIES

Poison Coefficient

The Poison Coefficient measures the rigidity of the material in the direction perpendicular to the application of the uniaxial tensile load applied. It is a dimensionless number, where the values generally vary between 0.25 and 0.35 for metals, with 0.33 being adopted for the large majority of cases.

For glass fiber posts, the Poison Coefficient is 0.22.

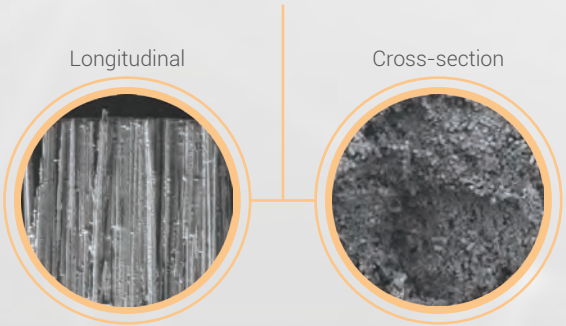
Flexural Strength

The flexural strength represents the maximum resistance to bending of a material before fracture occurs.

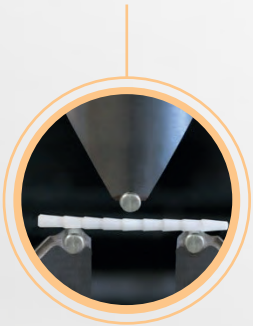
This property is clinically important, particularly in the act of chewing, when different masticatory forces occur, which induce various tensions, both on the tooth and on the restoration.

The resistance to fracture, or flexural strength, of fiber posts is increased due to the longitudinal arrangement of the fibers, and is measured according to ISO Standard 14125, using the 3-point bending test.

Arrangement of the fibers in different sections



3-point bending test



Elastic Modulus or Young`s Modulus

This is the amount of deformation of the material under a given strain.

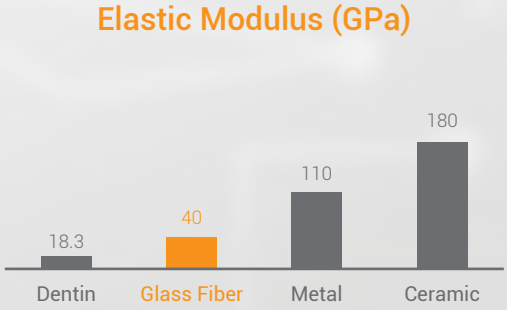
The elastic modulus of the material must be as close as possible to that of the dentin so that root fractures do not occur.

Elastic modulus of dentin: 18.3 GPa

Among the materials used, the elastic modulus of glass fiber posts is the one most similar to the elastic modulus of dentin, providing strength and longevity to the restoration of endodontically treated teeth.

Elastic Modulus of materials for use in dentistry compared to dentin

Material	Elastic Modulus (GPa)
Composite Resin	15
Glass Fiber	40
Titanium	90-100
Metal (NMF)	150-180
Ceramic	170
Dentin	18.3

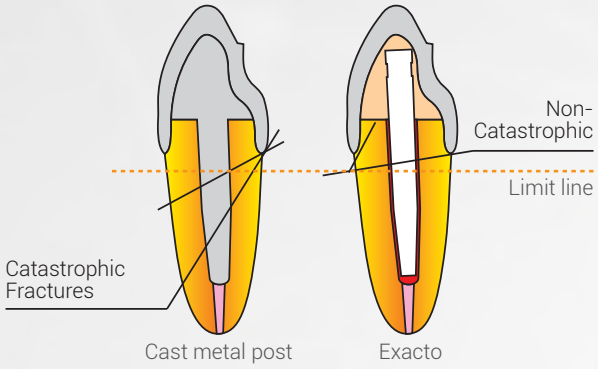


Absorption of forces

One of the big advantages of fiber posts is the fact that, when subjected to a force, they are capable of absorbing the impact without passing that stress on to the dental structure.

This is the reason why fractures are less frequent with these posts and, when they do occur, they are not considered catastrophic.

Fracture type



Comparison of root fracture type with cast metal posts and Exacto posts. Fractures with cast metal posts are considered catastrophic (below the limit line).

(SILVA, N R,; Effect of the height of the coronal remnant, the type of internal reconstruction, and the type of restorative crown on the deformation and fracture resistance of endodontically treated anterior teeth, Master`s Thesis - UFU 2008.)

Comparison chart for Angelus posts

	Reforpost® Glass Fiber	Reforpost® Carbon Fiber	Exacto	Reforpin®	Splendor-SAP
Shape	Parallel with apex conical, serrated	Parallel with apex conical, serrated	Double taper, smooth	Tapered, smooth	 Parallel post Tapered sleeve
Bur used	Wide/Peeso	Wide/Peeso	Exacto Bur	Does not use a special	Splendor-SAP Bur
Color	White	Black	Translucent	White	White
Sizes	1, 2 and 3	1, 2 and 3	0.5, 1, 2 and 3	Universal	Universal
Modulus of Elasticity* (GPa)	35-45	85-100	30-40	35-45	45
Flexural Strength* (MPa)	1000-1470	1250-1650	1000-1430	1000-1900	≥ 1200

*TESTS CONDUCTED ACCORDING TO ISO STANDARD 14125. Variables of values due to the different diameters of the posts.

RELEVANT CLINICAL CHARACTERISTICS

Ease of removal

If you need to remove the FIBER POSTS, the procedures will be easy to perform, because their structural composition do not present high resistance to attrition, and the longitudinal fibers guide the direction of the drill into the canal, facilitating its removal.

The removal technique can be done using burs or ultrasonic inserts.

Note: We recommend a thorough evaluation of the endodontic treatment, prior to placing any post.

Complete removal technique with burs

1

Cut the post at the chamber entrance

2

Make a notch on the post with a spherical diamond-tipped bur

3

Position the bur on the notch and activate it.
The post will disintegrate.

4

Re-prepared canal

Absence of corrosion

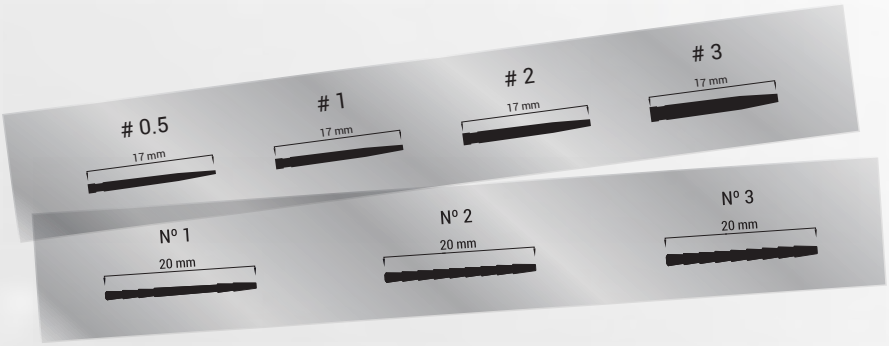
Angelus® Fiber Posts (Reforpost® Glass Fiber, Carbon Fiber, Exacto, Reforpin® and Splendor-SAP), do not suffer from corrosion over time or cause a metallic taste in the patient's mouth.

Time and cost savings

The technique of making posts with pre-fabricated fiber posts allows for creation of the post/core in a single session, eliminating steps and laboratory costs.

Measurement template

Angelus® Exacto and Reforpost® fiber post kits come with a template that facilitates the selection of the post of the best diameter for the clinical case.

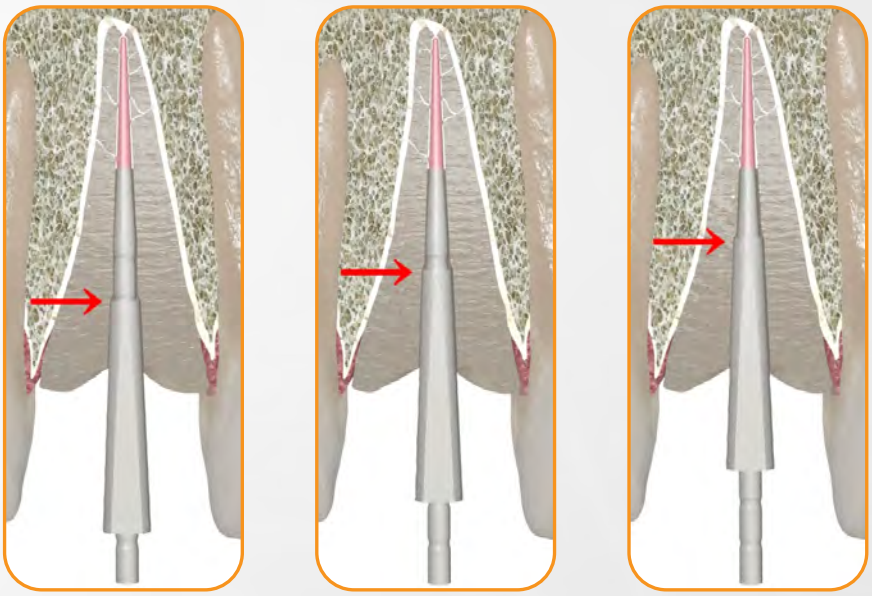


Select the post to be used in your clinical case with help from the template on page 9.

INDIVIDUAL CHARACTERISTICS

Splendor-SAP

- **Universal:** A single system to be used in different canal's morphologies: narrow, medium or wide simplify your inventory without various posts and drills sizes.



Narrow Medium Wide

SPLENDOR - SAP
Single Adjustable Post

Watch the video
Access the QR Code.

- **Anatomical: Adjustable to root canal** - The system promotes great adaptation to the canal diameter and taper.

  Adaptable to cervical region - The sleeve promotes a greater amount of fibers in the cervical region, allowing a smaller volume of cement and, consequently, greater resistance and retention to the post.

  Sleeve in oval shape - The sleeve shape adapts the oval anatomy of most root canals increasing the contact between the post and canal walls.

  Sleeve lateral opening - Allows the excess cement to flow from canal to the cervical space.
- **Increased retention:** SPLENDOR-SAP's exclusive design enables mechanical retention of the sleeve within the canal.

  Positioning the sleeve with the post fills the canal, increasing retention, minimizing risks of displacement.

  Minimally Invasive Preps: SPLENDOR-SAP can be used in canals with their original anatomical shape*, not requiring additional preparation.

  Follows the concept of "the post being adapted to the space not creating space to the post".

**Except in cases of atresic canals (less than 1,0 mm diameter).*

- **Low risk of root fracture:** The fiberglass composition of SPLENDOR - SAP provides an elastic modulus close to dentin, minimizing risks of root fracture.

- **Flexural Resistance:**

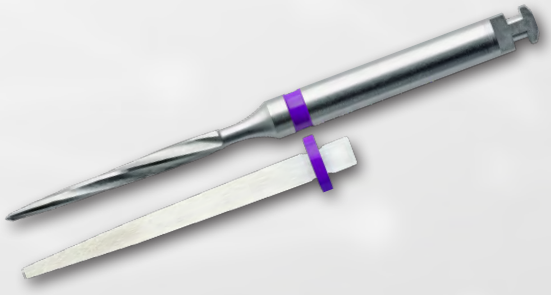
	Max Load (N)	Flexural Limit (MPa)	Deformation (%)
Av. Value	52,07*	≥1200	92,12

**The use of the sleeve increases the maximum post separation force by 3x.*

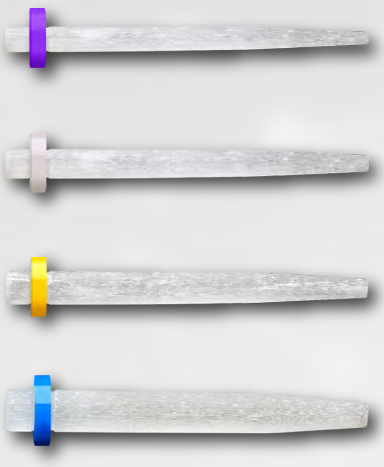
Exacto

- **Precise adaptation to the canal (post shape follows the anatomy of the canal):** the double taper and the special size enable the Exacto post to fill tapered canals more accurately, without leaving a thick line of cement;
- **Standardized bur without active tip:** Exacto burs exactly reproduce the diameter of the post and do not have an active tip, avoiding the risk of accidental perforations;

- **Special size:** Exacto posts have a smaller size (17 mm), so they can fill the canal entirely with their taper, avoiding spaces that can lead to future displacement of the post;
- **Identification colors on the post and on the bur:** to facilitate use and avoid possible errors in preparation;



- **Delimiting cursor:** the latex ring helps in delimitation of the cutting area, as well as identifying the numbering of the post:
- **Translucency:** the translucency of the Exacto posts allows for more aesthetically pleasing restorations.



Purple Exacto nº 0.5

White Exacto nº 1

Yellow Exacto nº 2

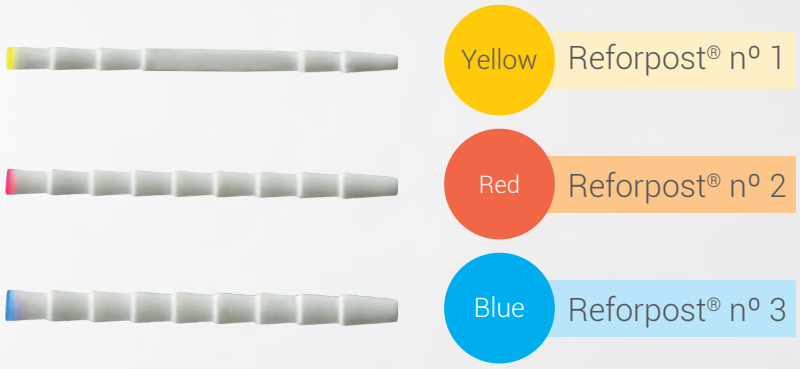
Blue Exacto nº 3

Reforpost®

- **High retentiveness:** The cylindrical, parallel shape and tapered apex of the Glass Fiber and Carbon Fiber Reforpost® make them very retentive. The additional circumferential mechanical retentions of the posts increase the area for adhesion of the cement;

- **Less wear on the tooth structure:** The use of Glass Fiber or Carbon Fiber Reforpost® in combination with the techniques of adhesive cementation allows for a smaller removal of dental structure, without the need for removal of intraradicular or coronal retentive areas. The tapered apical portion of the post also provides for less wear of dentin in the apical region;

- **Identification colors:** Better identification and agility in the work;



- **Standardized for Largo burs:**

Post	Largo Bur
1	3
2	4
3	5

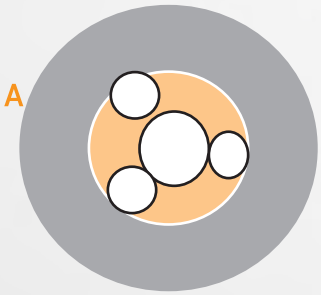
Reforpin® - Glass Fiber Accessory Posts

Wide, ovoid canals were still not an indication for pre-fabricated posts, because the filling of the canal was inadequate, with a very thick line of cement, which represents fragility for the procedure of reconstruction or restoration support.

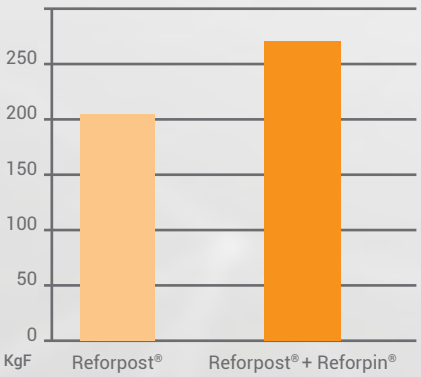
Reforpin® provides a better root canal fill, with a reduction of the cement line, as accessory gutta percha points during endodontic obturation.

The recommended technique for use, with cement filling the canal and a slight mechanical imbrication, eliminates possible risks of detachment, common in round canals (central incisors), and prevents the formation of a thick layer of the cement, especially when dealing with ovoid canals (pre-molars and molars).

With Reforpin® it is possible to resolve practically all cases of intra-radicular post insertion.



The major advantage of using Reforpin ® , however, is that it increases strength in roots that are already weakened.



(Conceição. A. B. - 2005)

Indications for Reforpin®

1. Wide canals

By inserting Reforpin® along with the main post, you can obtain an increase in the root's fracture strength and increase mechanical imbrication of the posts, providing total safety against the displacement of the post.

2. Narrow canals

In narrow channels, such as molars and lower incisors, you can avoid excessive wear of the dental structure by using only Reforpin®.

3. Teeth with no coronal remnant

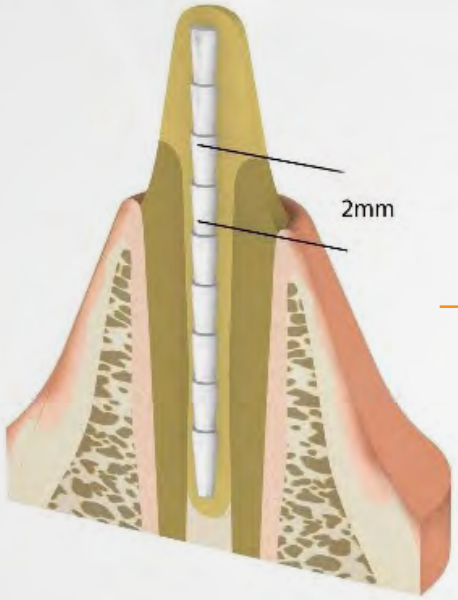
Teeth which have very little or no coronal remnant are contraindicated for the insertion of pre-fabricated posts, due to these posts having little structure in the cervical region, which is the region that mostly suffers the action of shear forces.

With the use of Reforpin®, the cervical region is protected with more glass fiber and, with that, there is greater absorption of impacts from these shear forces, not allowing for the displacement or fracture of the post.

INSTRUCTIONS FOR USE AND TIPS

Evaluation of the Clinical Case

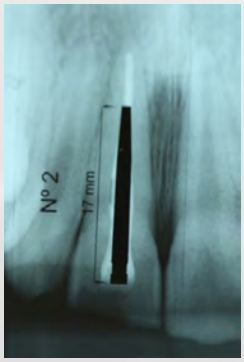
The tooth selected to receive a post must have at least 2 mm* of coronal remnant so that the forces of occlusion which are applied to the cervical region do not cause fracture or destabilization of the post.



TIP: Pre-fabricated posts should not be used on teeth that serve to support fixed extensive prostheses or abutment teeth with removable prostheses.

**Except in cases with Splendor SAP and cases reinforced with Reforpin, where a 2 mm tooth remaining is not necessary, as there is more fiber in the cervical region.*

Selection of the Posts



TIP: Use the X-ray and the template for this purpose..

Select the post according to the clinical case.

Preparation of the canal

TIP: always use heated instruments. The use of burs can lead to excessive or complete removal.

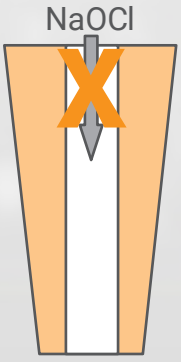
Perform partial gutta percha removal.

TIP: the bur for preparation of the post must enter and leave the canal one single time so as not to widen the canal beyond the dimension of the post.

Perform the preparation of the canal to receive the post, using the selected bur.

After the preparation, wash the canal with water.

TIP: do not use sodium hypochlorite for this cleaning, because it releases nascent oxygen and can interfere with the polymerization of resin cements.



After cleaning, etch with phosphoric acid for 15 to 30 seconds, and then wash with water.

TIP: to dry the canal, use absorbent paper points to prevent water pooling.

After acid etching, use a primer followed by an adhesive.

The adhesives most indicated for cementation of posts are those of the fourth generation, which have the adhesive and primer in separate vials. This generation of adhesives allows no adverse cement/adhesive reaction to occur, which would lead to a compromise in the polymerization of the cement.

TIP: in case of self-adhesive cements, the use of a bonding system is not necessary.

Preparation of the Post

The preparation of the post is done with the prior cleaning of the post with alcohol 70o. This cleaning process aims to remove any oil or dirt from the surface of the post, and also to increase the area of contact with the Angelus® Silane.

After cleaning, silanize the post with Angelus® Silane in order to improve the adhesion of the post to the cement.

Silane is a bi-functional compound that binds the silica present in the glass fiber with the organic matrix of the resins.

After silanization, use a compatible adhesive with the cement to be used.

If using self-adhesive cements, it is not necessary to use adhesive.

TIP: carbon fiber posts, since they do not contain silica in their composition, do not require silanization.

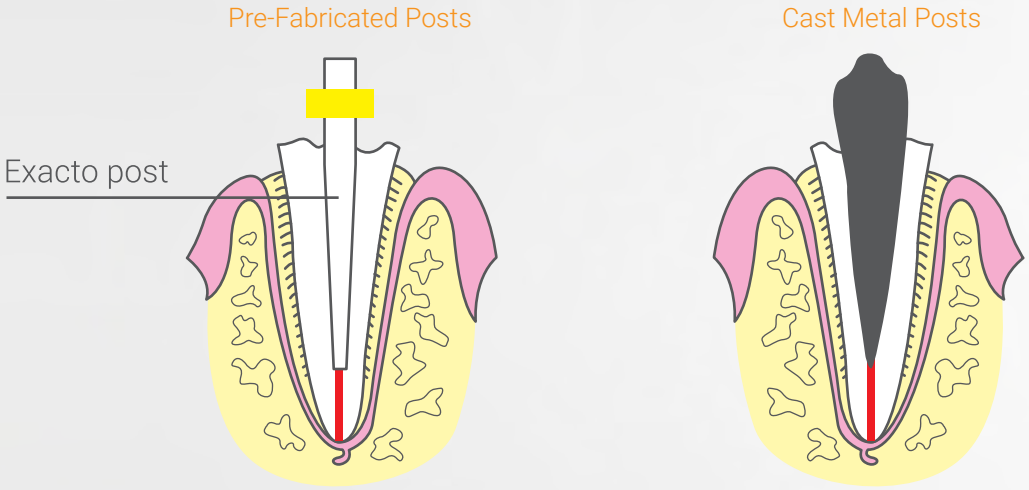
After the preparation of the canal and post, perform the cementation.

TIP: it is recommended to cut the posts before cementation in order to avoid vibration that may compromise the seating of the post. The cut should always be done with high speed cooled burs.

FAQ

1. What are the advantages of glass fiber posts versus cast metal cores?

In addition to the aesthetics and ease of use, the big advantage of glass fiber posts over cast metal cores is the conservation of the dental structure and the modulus of elasticity. The preparation for the pre-fabricated posts does not compromise the dental structure in the same way that for cast metal cores does and the fact that the modulus of elasticity of glass fibers is closer to that of dentin, so there is a lower risk of catastrophic fractures. The wear is much less accentuated, and with that, the root remains more resistant to fractures.



2. What is the indication for the tapered and parallel posts?

The clinical case is what will guide the indication. On teeth with more tapered canals (upper incisors, canines), give preference to tapered posts. On teeth with more parallel canals (lower incisors, premolars), give preference to the more parallel posts.

3. Why do tapered posts require specific burs?

Because they need to fit exactly to the canal, otherwise there may be a failure in retention due to their tapered shapes. Every tapered post requires a bur standardized to its taper ratio. The bur must enter and leave the canal only once, and should not work within the canal, to not compromise the dimension.

4. What is the latex ring on the Exacto post for?

To limit the cutting area and facilitate identification of the specific bur, which also hasthe same color as the ring.

5. Can fiber posts be used on posterior teeth?

Yes, just as with anterior teeth, the same criteria must be observed for the correct selection of the most appropriate post.

6. How should the cementation of glass fiber posts be performed?

The cementation steps are as follows:

a. Cleaning of the radicular dentin with acid etching for 15 to 30 seconds, washing and drying with absorbent paper cones;

b. Apply the adhesive system according to the manufacturer's instructions for use;

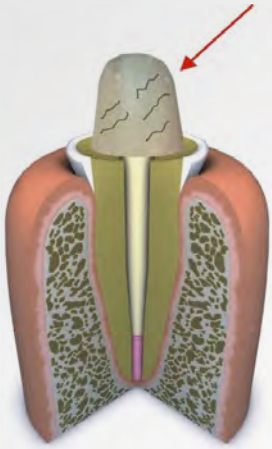
c. Cleaning of the post with alcohol for removal of oil and application of Angelus® Silane. Wait for 1 minute and gently dry with air;

d. Application of Chemical Adhesive on the post;

e. Cementation with cement with chemical or dual activation.

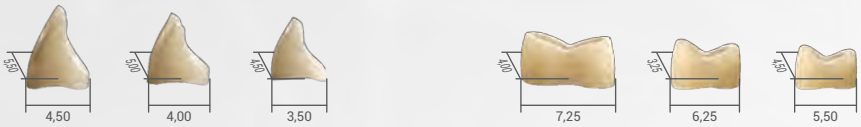
** in the case of Splendor, the post and the sleeve must be covered with cement, first the pin and then the sleeve must be inserted into the canal, removing the excess and proceeding with the polymerization.*

7. How should the crown reconstruction be done on glass fiber posts?

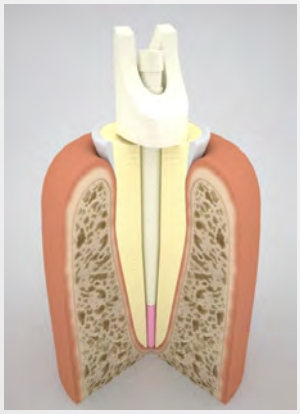


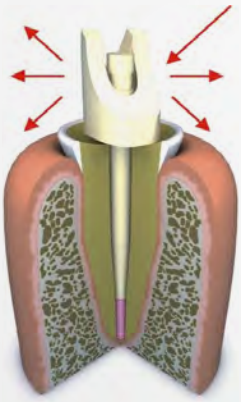
The reconstruction of the crown part is normally done with "core"-type resins, which have a higher inorganic load in their matrices. However, the resins are more fragile under compression and micro-cracks may appear over time, which would lead to displacement of the reconstruction (crown/restoration).

To resolve this, Angelus developed a system of pre-fabricated glass fiber cores.



With Reforcore, the forces applied to the tooth are dissipated and further preserve the remaining dental structure.





The Reforcore cementation technique is very simple and is performed simultaneously with the post cementation.

8. How can fiber posts be removed if there is a need for retreatment?

Bur removal technique or ultrasonic removal technique (on page 17).

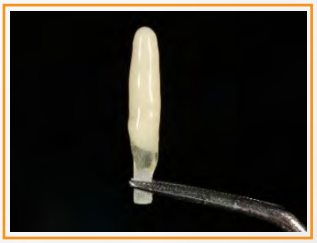
9. What is the technique of the relined post?

This technique consists in putting composite resin on the post and customizing the post to the canal. It is a technique normally used when the canal is wider or with a taper ratio that cannot be replicated with the pre-fabricated post.

The steps of the technique are as follows:

- Prepare the post in the conventional manner, silanizing it and using the adhesive;
- The canal must be isolated with water-based isolators;
- The post must be introduced into the canal along with the composite resin of choice, and must be light-cured for 3 seconds;
- Then, the post must be removed and light-cured outside the canal;
- Test the post and make the necessary adjustments before proceeding with the cementation.

10. What is the difference among Exacto, Reforpost, and Splendor posts?



Exacto and Reforpost are glove free and have so many types of drill and post sizes, while Splendor is universal: 1 anatomical size for every type of root canal. The Exacto is tapered and the Reforpost is parallel, while the Splendor has a parallel post and a tapered glove.

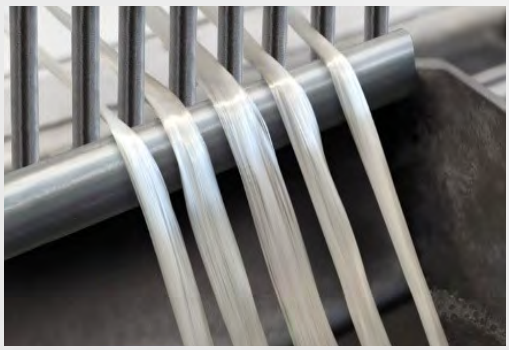
ANATOMICAL GLASS FIBER POSTS TECHNIQUE - STEP BY STEP

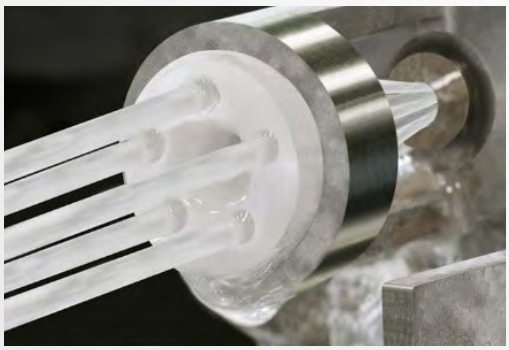
Watch the video
Access the QR Code.

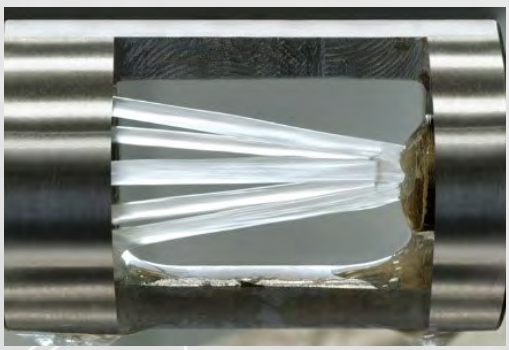
MANUFACTURING PROCESS OF ANGELUS FIBER POSTS

Angelus fiber posts are manufactured using the best practices, obeying the international regulations.

The manufacturing process has been improved over the years, seeking the best fiber/ resin concentration, in order to guarantee the best properties.







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