SCIENTIFIC TECHNICAL PROFILE

Interlig®

Reinforcement Fiber

angelus®

FDA APPROVED

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INTRODUCTION

Glass fibers were initially used by several industrial segments, primarily by aerospace and automotive, in addition to the naval industry.

Their physical properties such as low thermal and electrical conductivity, and their high strength and low weight drew the attention of the dental area, which saw in this material an alternative for the replacement of metal structure in fixed prostheses. With that, in addition to aesthetics, strength and biocompatibility were also gained.

Fiberglass is used where strength and lightness are required. Its use in Dentistry was limited starting in the 60s. Later, with the progress in the techniques of silanization and adhesion, the use of fiberglass in restorative dentistry and periodontics was revolutionized. The aesthetic quality and high mechanical strength allow elaborating immediate restorative work that is conservative, with high longevity and low cost.

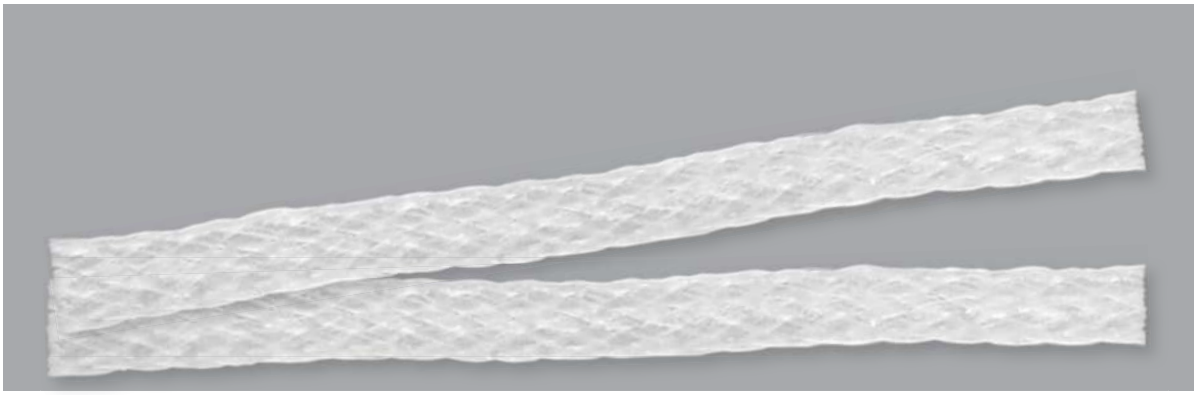
The splinting procedure is straightforward and the fiberglass has allowed this technique to be carried out in a quick, aesthetically pleasing and functional manner.

Evolution of splinting

About Interlig®

Interlig® is a reinforced composite material with glass fibers, for use in the clinic, with a range of applications: temporary periodontal or orthodontic immobilization, for emergency treatment of teeth lost due to periodontitis, pre-surgical splinting, for the reinforcement structure of fixed prosthesis, either mediate or immediate, for making intraradicular cores, for space retaining in primary or permanent dentition, for reinforcement of acrylic structure (provisional, total prostheses), for reinforcement of large restorations of composite resin.

Interlig® glass fibers are intertwined, which facilitates the use by the dentist. Their maleability is superior than that of the polyethylene fibers.



Interlig® can be cut with any cutting instrument, and does not require special equipment.

The glass fibers are impregnated with light-cured composite resin, and for this reason, no other type of adhesive or resin is needed to impregnate them. Pre-impregnation facilitates handling and improves bonding between the glass fibers and the composite resin.

The fibers are pre-impregnated with an unfilled resin matrix, using an immersion process with controlled time and temperature, in order to guarantee complete absorption and, consequently, guaranteeing the better mechanical performance of the product.

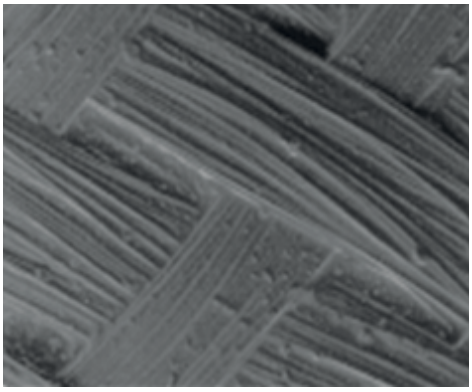
TECHNICAL DATA

Composition

- Glass fibers (60 ± 5% by weight).
- Impregnated composite resin (40 ± 5% by weight): Bis-GMA, diurethane, barium glass ceramics, silicon dioxide, catalysts.

Technical Data Sheet

Color	Translucent
Arrangement	Braided
Length	8.5 cm
Width	2.0 mm
Thickness	0.25 mm
Fiber content by weight	60%
Composite resin content by weight	40%
Flexural strength	131 (± 15) MPa (ISO 10477)
Expiration date	2 yeats
Polymerization time	20 seconds (per segment)



Braided fiber arrangement

FEATURES AND BENEFITS

- **Aesthetics:** the translucency of Interlig® fibers and of the resin matrix provides high aesthetic resolution;
- **Strength:** the structural composition of Interlig® fibers and their preparation for dental use ensure their high resistance to bending, ensuring their indication for a wide range of clinical situations;
- **Versatility of use:** Interlig® width can be adapted for use in various clinical activities;
- **Excellent bonding to composite resin:** the pretreatment of the Interlig® fibers allows for perfect adhesion to resins in use in the clinic;
- **Convenience of use:** does not require special tools for cutting and comes already impregnated with resin;
- **Reversible and minimally invasive technique:** due to its adhesion to the adhesive and resin systems, work done with Interlig® does not require invasion of the tooth structure;
- **Time-saving:** work with Interlig® can be performed directly in the mouth, allowing for its completion in one session;
- **Low cost:** compared to traditional techniques, using Interlig® allows you to perform more attractive and durable work, with a better cost-benefit ratio;
- **Packaging in sachets:** Interlig® comes wrapped in special sachets providing easy handling and protection of the fibers against the action of light and heat.

INDICATIONS

A. Splinting: periodontal, orthodontic and avulsed or extracted teeth;

B. Reinforcement of provisional restorations and direct and indirect prostheses (with natural or artificial teeth):

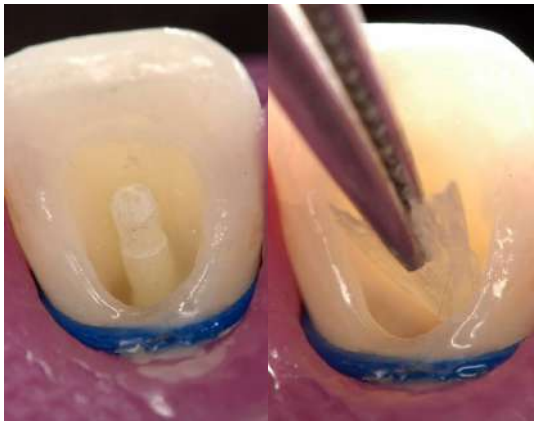
B1. Direct (office): extracted, avulsed or artificial tooth;

B2. Indirect (laboratory): artificial tooth.

C. C. Reinforcement and repair of acrylic resin prostheses;

D. Reinforcement of extensive restorations of composite resin:

D1. For anterior teeth;



D2. For posterior teeth;

PRESENTATION

REF	PRODUCT NAME	PRESENTATION
483	Interlig®	Box with 3 sachets of 8.5 cm each

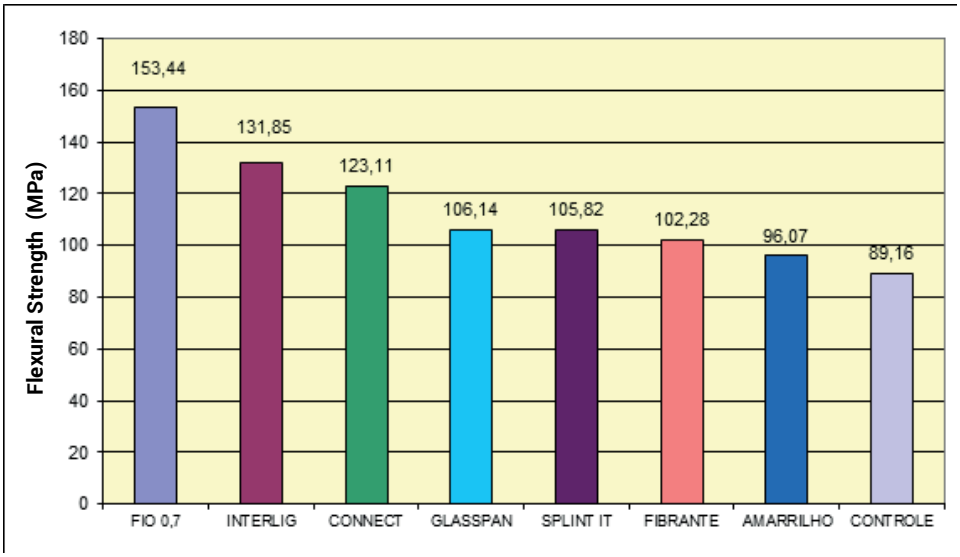
TESTS AND IN VITRO STUDIES

Effect of various reinforcements on the flexural strength and fracture type of a resin for provisional prostheses.

BASTOS, L. G. C.*, FERREIRA, P. M., RUBO, J. H.

The purpose of this study was to determine the effect of various reinforcements on the flexural strength and the type of fracture presented by specimens made of a polymethyl methacrylate resin (PMMA), when subjected to a three-point load test. Seven types of reinforcements constituted the experimental groups with ten specimens each: a wire 0.7 mm in diameter; a braided ligature wire; an Interlig® fiberglass braid (Angelus®); a Splint-It! interwoven glass fiber (Jeneric-Pentron); a Fibrante unidirectional glass fiber (Angelus®); a Connect polyethylene fiber (Kerr); and a GlasSpan flexible ceramic fiber (GlasSpan). The control group, also with ten samples, was composed of unreinforced specimens. The making of the specimens and the mechanical test were performed following modified standard ISO 10477. The analysis of the fractures was concurrent with the development of a new classification system dividing them into four types: Absent, Partial, Unseparated Total, and Separated Total.

The analysis of the results (ANOVA, $p < 0.05$) showed no statistical difference between the groups. The Tukey test found that the groups reinforced with 0.7 mm wire; Interlig® fiber and Connect fiber had significantly increased flexural strength. The fractures of the reinforced specimens were considered more favorable, with predominantly the Absent and Partial types occurring.



Graphical representation of the average values, in MPa, of Flexural Strength for each group.

Evaluation of flexural strength of full prosthesis base of thermopolymerizable acrylic resin, reinforced with glass fibers.

Dissertation submitted to the College of Dentistry of Bauru, of the University of São Paulo, as part of the requirements for the Master's degree in dentistry, in the area of Oral Rehabilitation. Bauru 2003

ELISEU AUGUSTO SICOLI

The search for materials that increase the fracture resistance of full prosthetic bases has been a constant, both on the part of researchers, and by patients seeking consulting of the clinic. A system that can increase resistance will bring more confidence to the full prosthetic user and greater durability to the prosthetic piece. Glass fibers are a material widely used in the naval and aeronautical industries, which currently has some indications in dentistry. In this study, we tested the flexural strength of specimens of acrylic resin with three types of pre-impregnated glass fibers, manufactured in Brazil (Fibrante, Interlig® braided and Interlig® unidirectional - Angelus®), according to ADA Specification No. 12. After the execution of the tests, the results were analyzed by one-variance analysis and Tukey test. We conclude that Interlig® unidirectional fiber had better performance, being statistically significant, and that the other two types of samples, although the specimens fractured at a greater force than the control group, were not significant.

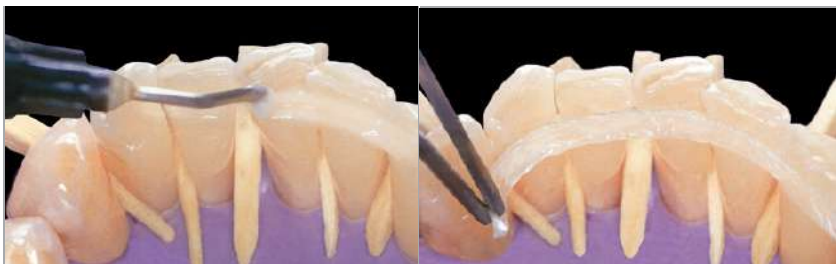
INSTRUCTIONS FOR USE AND TIPS

A. PERIODONTAL SPLINTING

TIP:
The making of the groove is an optional procedure and depends on the clinical situation.

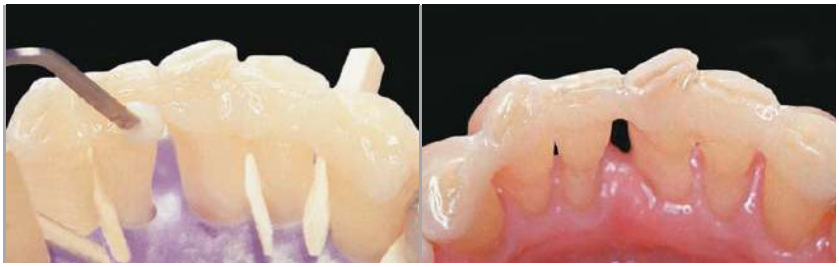
- Make a groove 0.8 mm deep and 2 mm wide;

- Etch with 37% phosphoric acid for 30 seconds, apply the adhesive, and light-cure each segment for 20 seconds;



TIP:
Use fluid resins to fill the groove

- Apply the composite resin, filling in half of the groove, position Interlig® in the groove, and light-cure each fiber segment for 20 seconds;



TIP:
The finishing and polishing is the same used for composite resin restorations.

- Apply a composite resin to cover the fiber, light-cure, and do the finishing and polishing.

B. MAKING DIRECT FIXED PROSTHESIS

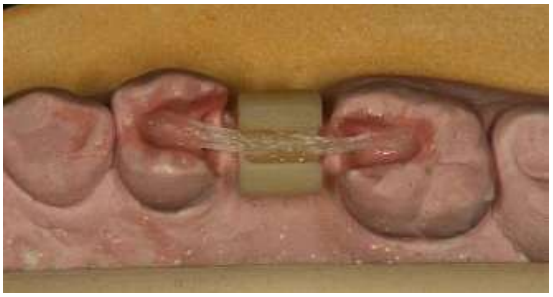
- Create a 0.8 mm deep groove, 2 mm wide, in the support teeth and the tooth extracted;

- Place the extracted tooth with some composite resin on the facial surface; do not do acid conditioning right now, since this resin will be removed; light-cure the resin. Follow the technique for etching and adhesion in the INSTRUCTIONS FOR USE AND TIPS A (pg. 13);

- End result after insertion of the Interlig® fiber.

C. INDIRECT FIXED PROSTHESIS (ON WORKING MODEL)

- Take the impression after fabrication of the cavities;



- On the working cast, position the Interlig® fiber and the pontic (Fibrex-Lab Pontic System);

- After light-curing the fiber, cover the whole structure with composite resin;

- Proceed with the final cementation.

D. REINFORCEMENT OF EXTENSIVE RESTORATIONS

- Insert the Interlig® fiber cut into small pieces into the deep part of the cavity and cover with composite resin. Light-cure for 20 seconds and complete the same layers as many times as necessary to fill the cavity;

- Always finish the restoration with a last layer of composite resin;
- Do the occlusal adjustment, finishing and polishing.

WARNINGS AND PRECAUTIONS

- Interlig® fiber components can be allergens. Avoid direct manual contact prior to polymerization. Wear gloves, mask and protective eyewear. In case of accidental contact, wash the area immediately with water. If any irritation persists, seek medical attention.

- Keep in a dry, ventilated place, protected from light and from excessive heat (ovens, heaters) and away from products with eugenol. It should be kept at room temperature up to 28°C.

- Store the remaining fiber in the package immediately after use to avoid excessive exposure to light.

- Do not leave Interlig® fiber exposed. In case of exposure to the oral environment, you can remove it superficially with drills and cover it with composite resin;

- Do not allow the structures formed by Interlig® to cause occlusal interference;

- Correction of parafunctional habits (e.g., clenching, grinding) is indicated before the use of Interlig®.

FAQs

1. **What are the indications for Interlig®?**

- Periodontal and orthodontic splinting;
- Splinting of traumatized teeth;
- Preparation of provisional direct and indirect adhesive prostheses;
- Reinforcement of extensive restorations.

2. **What treatment should be performed on the fiber before use?**

- Interlig® is already a silanized and impregnated fiber, so it is not necessary to do any kind of treatment before use.

3. **What is the advantage of industrial impregnation of the fiber with resin?**

- Pre-impregnated fiber has ten times more strength than fibers that do not come impregnated. For a complete resin absorption by the fiber, in addition to the appropriate volume of resin, silanization treatment of the fiber and resin immersion for periods of over 24 hours is necessary.

4. **What is the advantage of Interlig® glass fiber over polyethylene fibers?**

- Glass fibers have higher strength (131 MPa) than polyethylene fibers (86 MPa).

5. **How do you cut Interlig®?**

- Interlig® can be cut with any cutting tool.

6. **What are the measurements of Interlig®?**

- Each strip of Interlig® has 8.5 cm of fiber.

7. **Why does Interlig® come packaged in sachets?**

- The sachet packaging allows for a more suitable protection of the fiber against light and improves the conditions of storage of the material.

8. How many clinical cases can be done with one strip of Interlig®?

- Each strip of Interlig® is enough for up to 3 treatments of periodontal splinting.

9. Can Interlig® glass fiber be touched?

- Glass fiber, unlike polyethylene fibers which receive a cold gas plasma treatment, can be touched without altering its properties.

10. What are most important precautions when using Interlig® glass fibers?

- Glass fiber has to be completely covered with resin, because it is hydro conductive. If the fiber is exposed and incorporates water, there is loss of its properties;
- The fiber, since it is impregnated with light-cured composite resin, must be kept protected from light.

11. How long can Interlig® stay in the patient's mouth in cases of splinting?

- Provided that the fiber remains covered with resin, there is no time limit for keeping Interlig® in the patient's mouth.

12. How many elements can be splinted with Interlig®?

- There is no limit for this procedure, provided that the principles of tooth mobility and patient occlusion are observed. In more extensive cases, the use of two layers of Interlig® is recommended®.

13. For cases of splinting is it necessary to make grooves?

- The groove is only required if the treatment is permanent;
- For temporary use, it is not recommended to make grooves.

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