



RIBE-OPTOFIT®

---

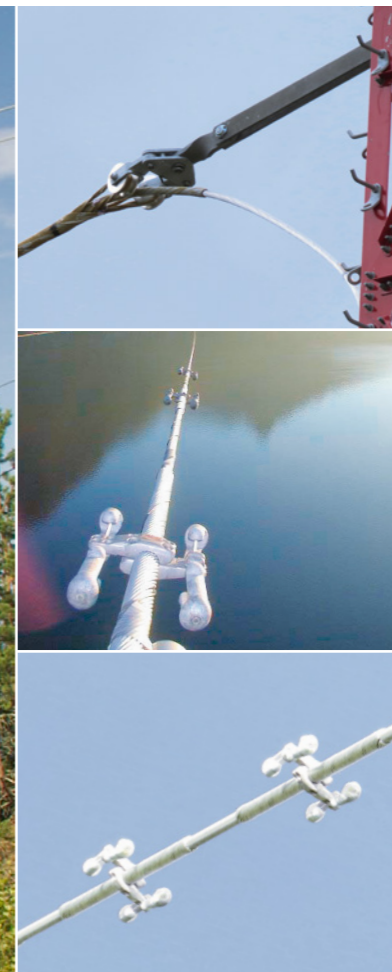
# RIBE-OPTOFIT®

PROTECT YOUR INVESTMENT

---

**RIBE®**  
ELECTRICAL FITTINGS





◀ Range of RIBE-OPTOFIT® fittings  
Special formed twin helical dead-end.

◀ Fjord crossing in Norway  
Sørfjorden: max. 1,600 m span length  
(350 kN RTS).

◀ RIBE®-Vibration damper  
In fjord crossing, long span fields

#### RIBE-OPTOFIT® Fittings

## EFFECTIVE PROTECTION FOR OPTICAL FIBER AERIAL CABLES



Optical fiber aerial cables are an established media for the transmission of information via overhead lines. The data is transmitted by means of modulated light pulses over optical fibers with a total diameter of approximately 300 µm for a single fiber in the interior of the cable.

Inadmissible radial forces acting on optical cables, cause a rapid increase in the optical attenuation at the load point, which in turn reduces the information flow through the optical fibers. The fittings used for the installation and operation of optical fiber aerial cables must therefore meet exceptional high performance standards.

RIBE-OPTOFIT® fittings are specifically designed to meet these requirements. We started developing fittings for optical fiber aerial cables as soon as these cables appeared on the market at the end of the seventies.

The range of RIBE-OPTOFIT® fittings has been proved in practice for decades and is continuously adapted to keep pace with the growing variety and constant improvement of optical fiber aerial cables. Our customers, such as electricity supply companies, optical cable manufacturers, erection firms, railway and telecommunication companies, receive the best technical solutions from the planning stage through to optimized fittings and state-of-the-art damping concepts for durable and reliable operation of their transmission lines.

### RIBE-OPTOFIT® HELICAL FITTINGS – OPTIMIZED DISTRIBUTION OF RADIAL FORCES TO THE OPTICAL FIBER CABLE

RIBE-OPTOFIT® fittings are designed to meet the increased demands on optical fiber aerial cables and even exceed the necessary mechanical requirements. The range of RIBE-OPTOFIT® helical fittings includes a suitable solution for every application. The method of operation of helical fittings has been adapted from nature and is based on the principle of a cable puller. The inside diameter of the unloaded helical rods is slightly smaller than the outside diameter of the optical fiber aerial cable. Installing these preformed helical rods creates

a spring tension and sets up the mechanical preloaded contact. A special feature of this design is that the helical fitting distributes the forces acting on the cable uniformly over a large area of the cable, which avoids mechanical loads on the optical fibers. The advantages of RIBE-OPTOFIT® helical fittings include easy installation and low load on the cable. The helical rods can be installed without tools and installation faults are impossible. The installation can be inspected visually from the ground level.





◀ Vibration dampers installed on protection rods.

◀ Aircraft warning sphere with installed vibration dampers.

RIBE-OPTOFIT® Fittings

## STANDARD AND HIGH-PERFORMANCE FITTINGS

Optical fiber aerial cables are generally divided into two types:

- Metal-armored cables (OPGW, OPPC, MASS)
- Metal-free cables (ADSS, AD-LASH, AD-WRAP, FOC)

Metal-armored cables are installed in overhead lines to replace the ground or conductor wires.

Metal-free cables are less expensive due to their design and are used mainly in supplementary installations.

Suspension fittings	Tension fittings
<ul style="list-style-type: none"> <li>• Armour grip suspension clamps</li> <li>• C-shaped supports</li> <li>• Suspension supports</li> <li>• Shunts</li> <li>• Vibration dampers</li> <li>• Steel parts for tower attachment</li> </ul>	<ul style="list-style-type: none"> <li>• AW helical dead ends</li> <li>• RW protection rods</li> <li>• Thimbles</li> <li>• Downlead clamps</li> <li>• Vibration dampers</li> <li>• Earthing connections</li> <li>• Steel parts for tower attachment</li> </ul>

Range of fittings for metal-armored aerial cables  
 RIBE-OPTOFIT® fittings for metal-armored optical fiber aerial cables are designed to resist large damage and failure loads.



Span length	Suspension fittings	Tension fittings
< 70 m	<ul style="list-style-type: none"> <li>• TG/LG suspension rods</li> <li>• Suspension pulleys with helical rods</li> <li>• Thimbles</li> <li>• Suspension pulleys</li> </ul>	<ul style="list-style-type: none"> <li>• AG helical dead ends</li> <li>• Thimbles</li> </ul>
70 - 150 m	<ul style="list-style-type: none"> <li>• TG suspension rods</li> <li>• UTA protection rods</li> <li>• Thimbles</li> <li>• Vibration dampers</li> <li>• Suspension pulleys</li> <li>• Suspension pulleys with helical rods</li> </ul>	<ul style="list-style-type: none"> <li>• AG helical dead ends</li> <li>• Thimbles</li> <li>• Vibration dampers</li> </ul>
150 - 4000 m	<ul style="list-style-type: none"> <li>• Armour grip suspension clamps</li> <li>• Spiral basin suspension clamps</li> <li>• Vibration dampers</li> </ul>	<ul style="list-style-type: none"> <li>• AW helical dead ends</li> <li>• RW protection rods</li> <li>• AG helical dead ends</li> <li>• URG protection rods</li> <li>• Vibration dampers</li> <li>• Thimbles</li> </ul>

◀ Range of fittings for metal-free optical fiber aerial cables

The design of metal-free optical fiber aerial cables precludes the use of fittings designed for metal-armored aerial cables. The application of adapted fittings for different span lengths ensures that our customers receive optimum solutions.





◀ RIBE® OPPC Termination Unit  
Brings fiber optics to ground.

◀ RIBE® OPPC Straight Joint Box  
OPPC joint for connecting two  
OPPC ends within the overhead line.

◀ RIBE® OPGW Metal Hood Joint  
Metal hood joint for all diameters.

RIBE-OPTOFIT® OPGW/OPPC Accessories

## DEVELOPED FOR MAXIMUM RESISTANCE FOR YOUR CONNECTIONS

Our RIBE-OPTOFIT® accessories offer the ideal solution for connecting fiber optic overhead cables and terminating the optical signal, and perfectly complement proven RIBE-OPTOFIT® fittings.

Optical connections of fiber optic cables require special solutions since data transmission in such cables takes place via modulated light pulses. Light pulses are transmitted inside the cables via optical fibers with a total diameter of about 300 microns. Straight joint boxes and termination units at the end points of the cable must ensure perfect transfer of the optical signal to guarantee that the line is stable and secure.

Our RIBE-OPTOFIT® range offers complete solutions for mounting and connecting fiber optic cables – all from a single source.

RIBE-OPTOFIT® OPGW/OPPC Accessories

## MAXIMUM SECURITY FOR YOUR FIBER OPTIC CONNECTIONS

Our fiber optic joints are designed for maximum resistance to all external influences. RIBE® fiber optic joint boxes perfectly protect optical fibers from water and humidity by providing an extremely high tightness class: IP 67. Aluminum cast housings provide maximum mechanical protection in such applications, where protecting sensitive fiber optic connections is an absolute necessity.

### ▶ OPGW METAL HOOD JOINTS

The universal metal hood joint 180 offers great flexibility for connecting OPGW cables since it covers all diameters from 9 mm to 28.6 mm with a single product. The hood joint installation set includes all of the parts and adapters needed to install all types of OPGW cables. This ensures fast, effective and cost-efficient on-site installation. Together with the optimized housing and connectors with variable inlet diameters, fewer single parts are needed for installation making the joint a flexible all-rounder.



Universal Metal Hood Joint Type 180  
Our metal hood joint for all diameters:

- Needed to connect two OPGW ends
- Quick and easy installation
- Low installation costs
- Reduced number of single components
- Easy to order
- No risk of missing components





◀ OPPC Standing termination unit

◀ OPPC termination unit  
Endpoint of a special formed twin dead-end consisting of protection rods, inside and outside dead-end for an OPPC with an insulator with additional weights.

▶ **OPGW METAL HOOD JOINTS**

All of our metal hood joints feature excellent properties such as high den-

sity and extremely high mechanical resistance – for connections that meet your demands.

Type	Universal Metal Hood Joint Type 180	Metal Hood Joint Type 250	Metal Hood Joint Type 290
Max. number of cable entries	4	4	6
Max. number of splices			
- with crimp splice protection	48	144	192* 288**
- with shrink tube protection	48	96	
Protection class (IP code)	IP 67	IP 67	IP 67
Fiber management	-	-	FIST Mark II

FIST is a trademark of Tyco Electronics \* Single circuit management \*\* Single element management

▶ **OPPC STRAIGHT JOINT BOX**

OPPC straight joint boxes are necessary to connect two OPPC ends.



▶ **OPPC TERMINATION UNITS**

When using OPPCs, the optical fibers are integrated in the phase conductor

and must therefore be separated from the electrical field with special OPPC termination units at both ends of the line.

Maximum voltage $U_m$ [kV]	36	72,5	145	245	420
Minimum creepage distance [mm]	1154	2407	5038	7693	12118
Arcing distance [mm]	395	730	1426	2146	3370
Pollution Severity Level	IV	IV	IV	IV	IV
Max. number of splices					
- with crimp splice protection	96	96	96	96	96
- with shrink tube protection	64	64	64	64	64



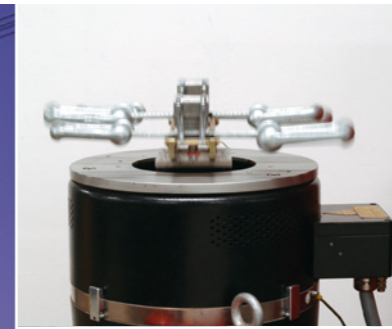
OPPC termination units  
RIBE® termination units come in different versions and cover a voltage range up to 420 kV, making them suitable for nearly all cable types.

▶ **OPGW/OPPC TUBE CUTTER**

Tool to securely cut the stainless steel tube.







◀ RIBE® Engineering  
Indoor vibration test bed.



◀ Fjord crossing in Norway  
Sunnalsfjord: 3 spans, max. 3,670 m span length (436 kN RTS).



◀ Suez Canal  
700 m span length (205 kN RTS).

RIBE® Quality & Service

## RIBE-OPTOFIT® – FOR A LONG AND UNINTERRUPTED LIFE

RIBE-OPTOFIT® fittings easily meet the highest requirements. All RIBE® solutions and products guarantee an excellent quality and a long durability – the result of perfect cooperation between development, production and sales combined with market knowledge.

RIBE-OPTOFIT® fittings ensure a long service life time and return on investment of your transmission lines. Our flexible production guarantees a constant delivery availability.

### REFERENCES FOR CHALLENGING SOLUTIONS

In the past years, RIBE-OPTOFIT® fittings have been used in the implementation of a wide range of projects throughout the world. Our damping concepts for metal-armored and metal-free optical fiber aerial cables have been successfully used in projects with large span lengths. The calculation of the damping properties includes the placement of in-span aircraft warning spheres, protection rods and in-span vibration dampers.

RIBE® Engineering

## MORE THAN 100 YEARS OF DEVELOPMENT AND EXPERIENCE

Since RIBE® was founded over 100 years ago, it has always been part of our corporate philosophy to not only develop and optimize new fittings in our own test laboratories and facilities, but to use our expertise to solve application problems as well. A fully equipped indoor vibration test bed with three spans (2x40 m, 1x30 m) is available for our qualified engineering team to perform vibration tests according to international standards and customer specifications.

Our laboratories use state-of-the-art systems for mechanical and electrical tests to enable us to react flexibly to verify the specific properties required by customers.

RIBE® Engineering can solve the customer's application problems using its own numerical simulation tools or programs created in close cooperation with noted universities such as the Technical University of Dresden or the Technical University of Darmstadt.

### REFERENCES & PRODUCTS

- Osterfjorden near Bergen  
max. 2,000 m span length  
(350 kN RTS)
- Bosphorus  
1,757 m span length  
(393 kN RTS)
- Lake Maracaibo  
2x 15 x 1,500 m span length  
(234 kN RTS)
- 3 gorges in China  
max. 1,800 m span length  
(430 kN RTS)
- Austefjord, Hundviksfjord, Storfjord  
3,106 m span length  
(695 kN RTS)

---

COMPETENCE CONNECTS

---



**RICHARD BERGNER ELEKTROARMATUREN GMBH & CO. KG**

Bahnhofstr. 8-16 · 91126 Schwabach · Germany  
Phone: +49 (0) 91 22 / 87-0 · Fax: +49 (0) 91 22 / 87-15 06  
E-mail: [electrical-fittings@ribe.de](mailto:electrical-fittings@ribe.de) · [www.ribe.de](http://www.ribe.de)