FIBRAIN®
Fiber Optic Solutions

Fiber optic cables

Fibrain Sp. z o.o.
The Fiber Technology Manufacturing and Laboratory Center in AEROPOLIS, the Subcarpathian Science and Technology Park, Jasionka

ABOUT US

Overview

Fibrain, the European leader in fiber optic and FTTH solutions have opened in January 2013 a new fiber optic cables factory in the AEROPOLIS Special Economic Zone in Jasionka near Rzeszow. The cable plant is conveniently located in the direct proximity to the Jasionka International Airport and the A-4 motorway junction. The new factory significantly solidifies our market position as one of the few leaders in the FTTH-dedicated cables and other specialized cables area – quite possibly it is currently the newest and most modern optical cables factory in Europe.

The new cable plant is equipped with the latest generation automatic cable lines from Rosendahl Austria and produces a full range of optical cables used in the next generation optical networks. This unique technological base makes it possible for us not only to manufacture optical cables meeting the highest current market requirements, but also to create and manufacture innovative installer- and eco-friendly cables for future applications. The factory itself has been designed with ecology and energy efficiency in mind – the handling and loading processes are greatly optimized and so is the internal usage of packaging. The plant has a centralized raw materials moving system, which makes the logistics much more streamlined and minimizes the risk of spillage or contamination. To accommodate the expected increasing demand, the factory has a modular construction, which makes it fast and easy to expand the production capacity in the future.

MANUFACTURING

Tomorrow's technology, today

Our cables are quickly becoming a synonym for quality and not without good reasons. We control the full cable manufacturing process – from the design stage (for which we use an advanced proprietary CAD software package ELMATIX PRO, developed by our R&D department), to technology fine-tuning and implementation, product acceptance testing and qualification, to manufacturing and the final product quality control (by an internally independent quality department). The ELMATIX PRO package is a powerful and reliable tool to design optical cables and calculate their mechanical properties and reliability. The package allows designing all types of optical cables, including the most demanding ones, from ADSS cables to microcables and dry cables. The package has implemented an extensive library of cable-dedicated materials, including for example PBT (Polybutylene Terephthalate), hydrophobic thixotropic gel compatible with PBT and acrylate, bimodal HDPE, non-halogenic materials (of the LSOH and FROH groups), ultra-durable high-modulus KEVLAR® or various super-absorbing materials to prevent longitudinal water penetration.

In the Fibrain cables we use only optical fibers from the world leading suppliers. Depending on the requirements and applications we use different fiber types, from the standard G.652D to the newest bend-optimized G.657B3, fiber with the standard 1% proof test specification or high proof test (for example 2%) fibers or 200 um reduced coating fibers for ultra-dense cables. Similarly, the full palette of multimode fibers is available, from 62.5 um core OM1 to OM2 and OM3 and the recent OM4 fibers. Our cables support all possible data transmission speeds, including the current bleeding edge 100Gb/s transmission and the next 400Gb/s.

Optical cable manufacturing
Optical fibers on spools, just before tubing process

Optical cable manufacturing
Process control center

QUALITY CONTROL

Excellence promise

The best design is not enough if it cannot be translated into repeatable and consistent quality of the final product. That's why we have introduced and obey a strict technological regime in our factory. Fortunately, thanks to the modern, automatic cable lines this regime is now much easier to achieve and maintain than it used to be in the past.

The producer of the manufacturing and in-process quality control equipment, Rosendahl Austria, is the globally recognized leading supplier for the cabling industry. The cable lines installed in our plant have unique real-time in-process capabilities to monitor and control all relevant cable parameters, including fiber excess (at all cable manufacturing stages) or sheath outer diameter. Similarly, all process parameters are monitored, analyzed and stored in the online database, so every cable drum has its fully traceable birth certificate. During cable manufacturing, at every production stage the tension and twisting forces are monitored and controlled so that the allowable fiber tensile and twisting stress is not exceeded, as it would have impacted the long-term cable reliability. At this point, it should be noted that any uncontrolled stress above a certain level (comparable to the proof test level for the given fiber) which the fiber is subjected to results in a significant reduction of the fiber lifetime. It is worth bearing in mind that a cable is laid into the ground not for a year or two, but typically the expected service period is over 20 years!

Equally important is the control of the cable outer diameter, particularly for microcables. Our production lines are equipped with real-time outer diameter control systems with an instantaneous corrective action functionality, capable of detecting even sparse point defects of the geometry.

Optical cable manufacturing
In-process laser control of the cable diameter

According to the customer requirements, cable identification and marking is either jet printed (on LSOH sheaths) or by hot stamping (polyethylene sheaths). The marking durability is tested for abrasion resistance according to IEC 60794-2.

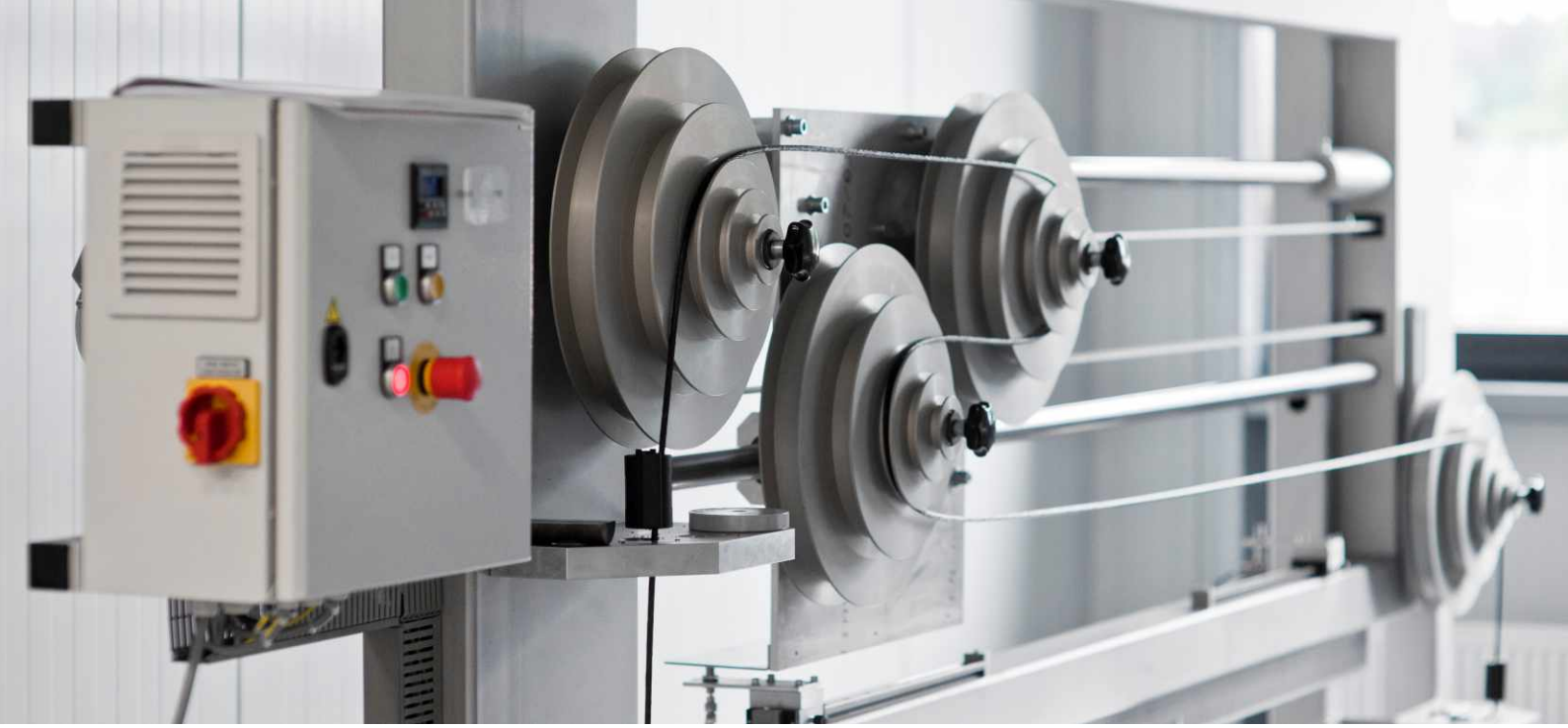
QUALITY CONTROL

Laboratory

One of the most important elements of our quality control is the internal qualification laboratory and obviously the quality control department. The quality control department is equipped with the specialized, cable factory-dedicated Photon Kinetics 8000i series optical reflectometers, with the OASYS system. Their testing capabilities include insertion loss and reflection loss measurements at 850 nm and 1300 nm (for multimode cables) and 1310 nm, 1550 nm and 1625 nm for singlemode cables.

But before a product type is approved for general availability, it has to undergo a series of tests, most often executed according to the IEC 187000 and IEC 60794-1-2 standards. This qualification-type testing is done by our internal qualification laboratory. The laboratory performs a full range of mechanical, climatic and environmental and optical tests. Besides the regular tests included in the aforementioned standards, the laboratory tests, if required, our cables for compliance with the customer internal specifications.

Quality control
Singlemode and multimode cables OTDR testing



Laboratory
Mechanical tests - flexing test apparatus

The mechanical tests performed in our laboratory include tensile performance testing (with fiber strain monitoring), crush, abrasion, impact, stripping force stability, repeated bending, torsion, flexing, kink, bend, cut-through resistance and so on.

As examples of the environmental tests it is worth mentioning the longitudinal water penetration test, -40 ºC/+70 ºC temperature cycling tests or UV resistance tests. Moreover, if even more stringent testing conditions are required, our testing capabilities does not stop here. For example, the temperature cycling test can be done at such an extreme exposure as -90 ºC /+90 ºC!

For particular cable types there are specific operational tests. Again, as an example, microcables undergo blowing tests into microducts or ADSS cables are tested for Aeolian vibrations and compatibility with suspension clamps and fittings.

One of our strengths is that we are not only limited to cable manufacturing. In fact, our experts are actively engaged in all phases of network projects rollouts, from the network design and planning phase to the installation and acceptance testing stage. We also manufacture connectivity elements and passive optical devices for telecommunications and offer training and installation services. As seasoned practitioners we can draw on years of experience and help you make your project as seamless and effortless to implement as possible. We not only supply products, rather we offer comprehensive self-contained solutions, which, backed by the competence of our sales force and technical support teams constitute a truly unique offer in the market.

Fibrain fiber optic cable factory
View on the main production floor from the conference room

OTHER PRODUCTS AND SERVICES

Our offer

FibrainDATA – structured cabling system, which offers high class components, unique design and the best technical solutions. Our own strict internal specifications resulted in a system with performance significantly better than the requirements defined in the ISO/IEC 11801, EIA/TIA-568, EN 50173 standards. We are confident that our broad portfolio, which includes everything from the U/UTP to F/UTP, U/FTP, F/FTP solutions for the 5a, 6, 7, 7a categories, will fully satisfy your needs regarding the structured cabling system. The system is complemented with fiber optics elements utilizing tight and loose tube cables for indoor and outdoor applications. With safety, reliability and environmental durability in mind, our system includes various cable types with different jackets and internal construction for different applications. The cables meet the most stringent requirements for non-flammability, self-extinguishing, no toxic gases emission and UV resistance. Fiber optic cables are available both with singlemode and multimode (OM1, OM2, OM3 and OM4) fibers, offering the current transmission speeds up to 10G and being future-proof for the next 40G and 100G applications.

Fibrain LogiWire – a complete system integrating structured cabling and other media, typically installed in modern buildings of our technological era. The system is targeted at single family housing and multi dwelling building, as well as at small enterprises (shops, offices). LogiWire integrates and helps organizing multimedia and low-voltage installations and is widely used by developers and housing co-operatives and associations. Thanks to its full integration with our other systems (the copper FibrainDATA and fiber optic Fibrain FTTH) it is possibly the most installer-friendly solution in the market to bring to one point and organize copper, coax and fiber optic media. A real must-have for modern intelligent houses and offices!

PON – a full portfolio of passive optical devices, mostly (but not exclusively) for telecommunications. The devices find applications in all types of optical networks, from access to long-haul DWDM networks. Our in-house technologies include FBT (fuse biconical tapering) and TFF (thin film filters). The portfolio ranges from power splitters/couplers (including asymmetric customized splitters) to attenuators, circulators, dispersion compensating modules to specialized CWDM and DWDM multiplexers.

Connectivity – the catalogue presents our connectorization capabilities. The portfolio includes all of the most often encountered types of optical connectors (for singlemode and multimode applications), cable bundles, different types of fanouts or assembled sets, patchpanels and wall boxes. The number of variants and possible alternatives is very large and we welcome inquiries for customized products. Our design teams and rapid prototyping capabilities guarantee short time to market for new products.

MetroJet – our modern microduct solution is the best response to the growing capacity demands for telecommunications duct systems. Functionally, a microduct system is a multi-conduit system with significantly reduced diameters of all of its elements, from pipes to cables and connectors. The microcables used in the microducts are installed by air-blowing. Thanks to our textured, unique design microcables, the installation distances obtained with our system are second to none. The system is fully certified and we offer up to 10 year system warranty for the certified, audited installations. Complementary to the system is our training module when the participants have the opportunity to practice full system installation (including cable blowing) on our internal test track.

FTTH – we started designing and manufacturing FTTH systems long before they have become popular in Europe, so our systems are backed by years of experience. We realize that every FTTH project is unique and there are always many reality constraints, which may make some technologies less applicable in the particular project. That's why we offer a very broad portfolio of complete passive infrastructure systems, so we are confident we have a solution optimal also for your project. The main FTTH infrastructure systems (and it is worth bearing in mind that each one may come in several variants) are:

- for outdoor last mile access
  - Metrojet – microducts based system.
  - AirTrack – aerial system, utilizing ADSS-type cables,
  - EAC-A8 – also an aerial system, but based on the outdoor Easy Access Cables,
  - DAC – system based on direct burial cables,
- for indoor last mile access
  - EAC-R – system based on the (typically) vertically installed, easy access riser cables,
  - DROP – system utilizing prefabricated and preterminated subscriber kits based on the drop cable,
  - VERTIJET – system based on indoor microducts, with blown-in (or pulled) prefabricated subscriber cables,
  - LogiWire – media-integration system, which organized copper, coax and fiber optic media, as well as low-voltage installations.

All our system are complete and fully self-contained, with the required mounting and connecting accessories or installing tools. We also offer training for our customers, which may end with an exam to obtain installer's certificate.

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