

Draka Communications - a member of Draka Holding N.V. located in Amsterdam - offers a versatile and reliable range of copper and optical fiber cables for the transmission in the data and telecommunication industry. Our long-lasting expertise in cable and fiber business has been the basis for us holding a major market position today. Draka Communications is located in more than 30 countries in Europe, Asia, North America and South America.

Value Innovation is a way of looking at the world. What we can do to help our customers do more, make more, save more and achieve more? A lot. We help our customers to stay ahead. By combining market insight with technological know-how and building strong, long-lasting relationships, we add value to their business with advanced communication solutions and services that are designed to last. No matter how complex your challenge, we have a product or solution that will do more than meet your needs. And if for some reason we don't, we'll make it for you.

New applications, breakthrough cables, custom connectors or complete network designs - it's all part of what we call Value Innovation, and it's what drives us, with the LongLine, Draka, is offering a brand new fiber to all those that have long distance, high capacity data transport needs, across oceans or continents. The Draka LongLine™ offers more while limiting your total cost of ownership. It is a future proof solution for any ultra long haul system.

### Why Draka's LongLine™ fiber?

- Record effective area; extremely low sensitivity to non linear effects
- Low loss, low PMD and finely tuned chromatic dispersion characteristics
- Unique set of characteristics for present and future very high bit rate transmissions
- Low macro and micro-bending losses, suitable for any cable design
- Field proven reliability of Draka's optical fibers for decades

#### Further information

Interested by these new exciting possibilities?

Want to get the complete Draka LongLine™ datasheets?

Please contact us at one of our locations, for which full details are provided below.

#### Draka LongLine™

Shrinking the world  
with longer distance,  
higher capacity,  
lower cost cable



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## Draka's LongLine™ fiber

### Longer distance, higher capacity, lower cost

#### It's benefits

##### Longer distance

The Draka LongLine™ offers a unique combination of a record effective area and of a very low attenuation on the C- and L-bands. The record surface area limits the nonlinear effects. Higher power can be launched to maintain the optical signal to noise ratio longer in the safe region. Of course the very low attenuation further increases the gain in distance.

In submarine +D/-D architectures, span length can be increased by more than 5% compared to the prior state of the art. In terrestrial systems, compared to standard single mode fiber (G.652.D), the gain in distance is at least 15%.

##### Higher capacity

In DWDM transmission, nonlinear effects impact system designs by reducing the number of transmitted channels and the bit rate per channel. With its record effective

area the Draka LongLine™ dramatically reduces the nonlinear impairments, enabling compact channel spacing and high bit rates. It perfectly meets today's and tomorrow's requirements for high capacity and high bit rate: 10, 40, 100 Gbps and higher, whatever the modulation format. In addition, the very low PMD and the possibility to perfectly compensate for the chromatic dispersion are leveraging the benefits of the reduced sensitivity to nonlinear effects.

##### Lower cost

Alleviating the limitations of nonlinear effects on system design results in more capacity, longer distance; coming to this simple conclusion: the cost per bit is dramatically reduced. Take for instance submarine transmission systems: the number of repeaters is reduced, and the burden of the link design is lightened, making it less complex. CAPEX and OPEX are reduced, and so are the failure risks.

#### It's characteristics

##### Trench designs

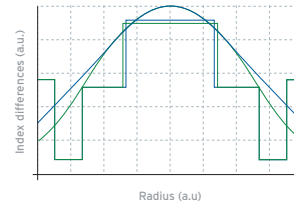
Trench design and PCVD. Those are the secrets of the Draka LongLine™. PCVD, a Draka's proprietary process, is an unique enabling technology for the industrialization of trench designs. Trench design and PCVD are at the deep root of the success of the Draka BendBright™-XS, the industry leading fiber for FTTX applications. For this BendBright™-XS application, trench design has been used to drastically decrease the macro- and micro-bending sensitivities of fibers while keeping same effective area and same cable cutoff wavelength as those of a standard single-mode fiber.

##### Low loss and very high effective area

In the LongLine™, dedicated to ultra long haul applications, the trench is used to enlarge the effective area and control the cutoff behavior while slightly improving the bending performances compared to those of a standard single-mode fiber.

In practice, the trench allows to confine the mode tail so that lower bending sensitivities than those of a standard single-mode fiber are obtained with a

*Trench confines the mode so that bending sensitivity is lowered, cutoff is controlled and loss is reduced*



much larger effective area (+50% increase, from 80 to 120 $\mu\text{m}^2$  at 1550nm). The macro-bend losses for a 10mm radius at 1625nm are ~5 times less than for a standard single-mode fiber, and the micro-bend losses (fixed-diameter-drum method of the IEC TR 62221) are ~2 times less than for a standard single-mode fiber with same coating.

This mode confinement and the more general protective effect of the trench also allow to reach very low attenuation levels of 0.185dB/km at 1550nm.

##### Finely tuned chromatic dispersion characteristics

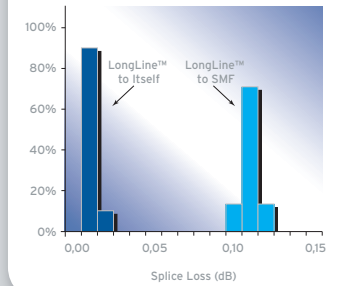
The dispersion characteristics are similar to those of fibers with effective areas around 105 $\mu\text{m}^2$  used in submarine transmissions and can thus be easily compensated for with commercially-available negative-dispersion fibers in such systems.

These dispersion characteristics are also very close to those of a standard single-mode fiber (~10% difference). As a consequence, dispersion-compensating modules coming from standard productions and used in terrestrial transmissions can straightforwardly be employed for the compensation of LongLine™ fiber over the entire extended C-band. The residual dispersion of a link made of Draka LongLine™ fiber and of a standard dispersion-compensating module is in the range of 0.05.

##### Splicing

Splicing Draka LongLine™ is advantageously comparable with standard practices. Due to Draka original trench-assisted design, the LongLine™ fiber does not incorporate any specific glass material making it fully compatible with standard splicing equipment and procedure.

*Bidirectional OTDR measurement at 1550nm.*



When splicing Draka LongLine™ to enhanced Single Mode Fiber, splice loss as low as 0.11 dB can be readily achieved. Customized splicer settings are naturally required to ensure optimal splicing performance. Specific splicing parameters are currently under development and will be available for applicable splicing models.