

Ultra-High Fiber Count Optical Fiber Cable Compatible With European CPR

1. INTRODUCTION

With the recent increase in data traffic, networks are becoming larger and larger in capacity through the development of optical fiber cable networks and data centers.

This product has been developed mainly for use around and inside data centers, and has an ultra-high fiber count structure achieved by using intermittently bonded ribbon fibers (Rollable ribbon), and also has features such as high flame resistance and low smoke generation that comply with the European Construction Products Regulation (CPR). In addition, it has high mechanical properties and environmental resistance equivalent or superior to conventional products, making it an effective solution for both indoor and outdoor applications regardless of the environment in which it is used.

2. FEATURES OF ROLLABLE RIBBONS

In order to realize an ultra-high fiber count structure that accommodates more optical fibers in a cable, this product uses rollable ribbons as shown in Figure 1. Unlike the conventional ribbon fiber structure in which adjacent optical fibers are continuously fixed with adhesive resin, the rollable ribbons are intermittently bonded to each other, allowing the shape of the ribbon fibers to be easily deformed and the ultra-high fiber count structure to be achieved by storing them densely inside the cable. On the other hand, when removed from the cable, it has the same flat structure as conventional ribbon fibers, so workability, such as multi-fiber batch fusion splicing, etc. is equivalent to that of the conventional ribbon fibers.

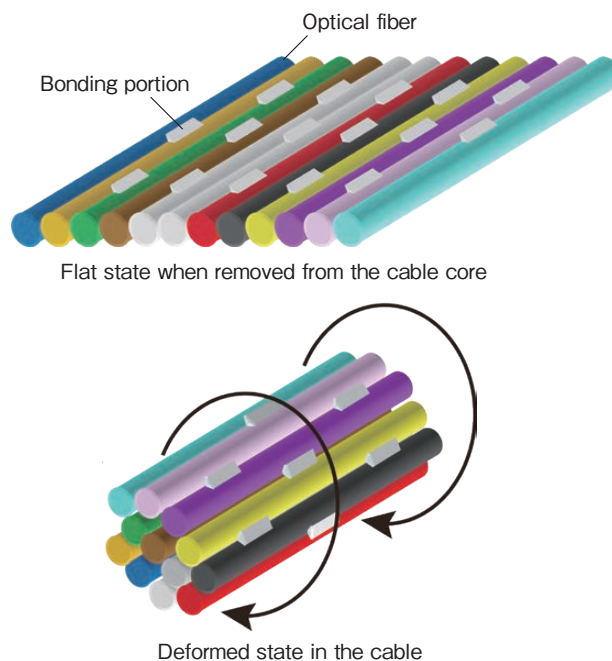


Figure 1 Structure and features of the rollable ribbon.

3. ULTRA-HIGH FIBER COUNT OPTICAL FIBER CABLE COMPATIBLE WITH THE EUROPEAN CPR

Figure 2 shows the structure of the 3456 fiber cable as an example of this product. 12 rollable ribbon fibers consisting of 12 optical fibers are bundled together to form a 144 fiber unit, and 24 of these 144 fiber units are placed in the center of the cable. The surrounding area is covered with a protection tape to ensure various cable characteristics,

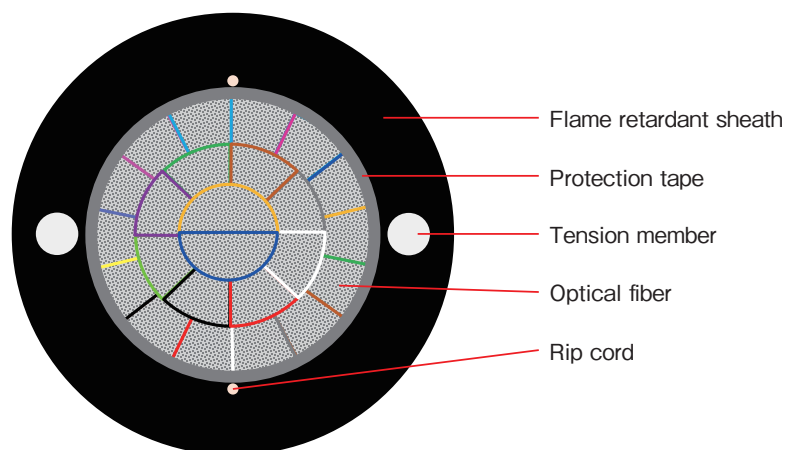


Figure 2 An example of the 3456 fiber cable.

and a flame-retardant outer sheath with tension members and rip cords arranged within the cross section are applied.

Table 1 shows the characteristics of the 3456 fiber cable. Various combustion characteristics in accordance with the European CPR show a high flame resistance and a low smoke generation and when used indoors, even if a fire should occur, the effects of the cable member combustion can be minimized.

Table 1 Example of the cable performances (3456 fiber cable).

Characteristics and evaluation conditions		Evaluation results
Cable diameter		Approx. 25 mm
Cable weight		Approx. 580 g/m
CPR certified grade		Cca/s1b/a1/d0
Attenuation	Measured @1310 nm	< 0.40 dB/km
	Measured @1550 nm	< 0.30 dB/km
Repeated bending	10 times the radius of cable outer diameter	< 0.10 dB/km
Compressive strength	2200 N/100 mm	< 0.15 dB/km
Impact resistance	1.0 kgf, 1 m	< 0.15 dB/km
Temperature cycling	-30 - +70°C	< 0.15 dB/km

- CPR certified grades are Cca: flammability, s1b: smoke emission, a1: acidity of produced gas, d0: combusting droplets, respectively.
- Each mechanical property and temperature property are evaluated at a measurement wavelength of 1550 nm.

While possessing such a high flame resistance, the cable has mechanical and environmental resistance characteristics equivalent or superior to those of conventional cable for outside use only, making it possible to use the cable for both indoor and outdoor use. This feature eliminates the need to install separate outdoor and indoor cables, as has been the case in the past, and enables an efficient network construction with reduced cable installation and connection works by directly pulling cables from outside to inside the data center or directly connecting multiple buildings on the data center campus.

4. CONCLUSION

This product has an ultra-high fiber count structure that uses the rollable ribbon fiber technology. It has features such as high flame resistance and low smoke generation that comply with the European CPR, while at the same time possesses mechanical properties and environmental resistance equivalent or superior to those of conventional products. These features allow the product to be used both indoors and outdoors, and it is expected to contribute to the construction of safer and more efficient optical fiber networks, especially when applied around and inside data centers.

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