New Products

Large Diameter Fiber Cleaver CT-105/106

Large diameter optical fibers are made of silica and have cladding diameters several times larger than those of typical telecom optical fibers. These fibers are capable of transmitting high optical power and thus used in lasers that require high power laser energy delivery and in sensors. To improve the quality of a product with a large-diameter optical fiber, the cleave angle of the fiber needs to be as small as possible. Fujikura has developed high-quality large diameter optical fiber cleavers to meet these challenges. These cleavers can cleave fibers with cladding diameters between 80μm and 1250μm, photonic crystal fibers and capillary tubes (hollow glass tube).

Features

1) Achievement of small cleave angle

·When an optical fiber is cleaved, the appropriate and optimum tension and clamp vary greatly by fiber, for example, from a fiber with a small diameter of 125 μm to one with a large diameter of 1000 μm. To achieve a small cleave angle, a fiber needs to be carefully cleaved by the setting of clamp force and tension appropriate to the fiber so that the cut on the fiber becomes small. In the new Large Diameter Fiber Cleaver, by simply selecting the correct cleaving mode for a particular fiber diameter, the appropriate clamp force and tension is set automatically, thereby enabling low cleave angle. Cleave quality also depends upon small blade intrusion and crack size, so it is also important to decrease the contact count and depth between the optical fiber and the blade. Cleaving results of a ϕ 125μm optical fiber and ϕ 1000μm optic fiber are shown in Figure 1. As can be seen, the cleave angle results of both optical fibers are very good.

2) Automatic fiber clamp system

·It is important to clamp the fiber using the appropriate clamp force, and the best clamp force depends upon the fiber diameter and any special fiber structure or properties. Generally, the clamping method for large diameter fibers requires use of the fastening power of a screw clamp, or pneumatic clamps using air pressure. Therefore special tools and equipment are required, and may be dependent upon operator practices. The new Large Diameter Fiber Cleavers allows simple operation. This has been achieved by a unique clamping system which automatically applies the appropriate clamp force by use of a motor-controlled mechanism, as shown in Figure 2.

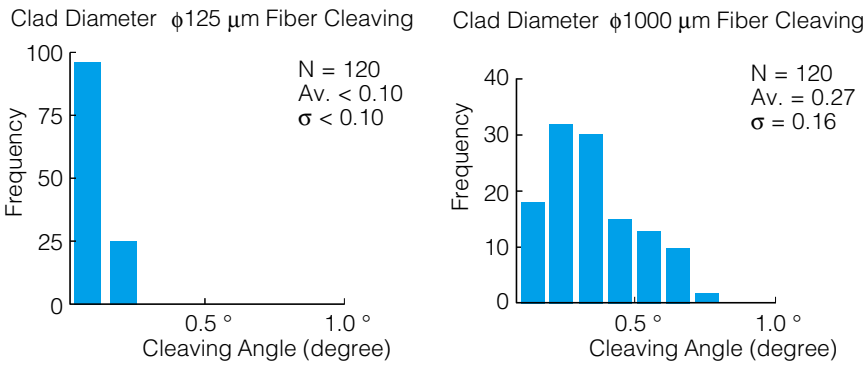

Fig. 1. Cleave Angle Performance.

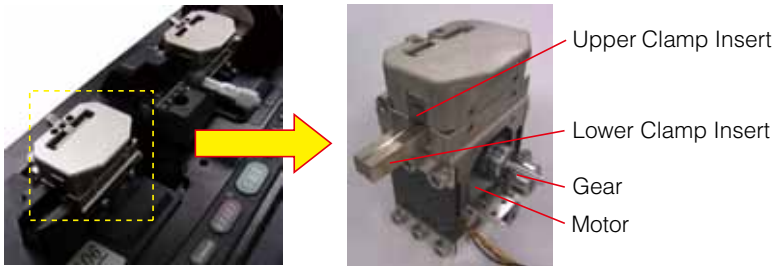

Fig. 2. Clamping System.

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3) Cleaving fibers with various cladding diameters

·The Large Diameter Fiber Cleaver can accommodate optical fibers with cladding diameters from ϕ 80μm up to ϕ 1250μm. Easily exchanged clamp insert parts are selected depending upon the fiber cladding and coating diameter. (Figure 3)

4) Cleaving fibers that have special structures

·The Large Diameter Fiber Cleaver can cleave fibers with special internal structures such as photonic crystal fibers and capillary tubes (hollow glass tube) by the ehoice of appropriate cleaving parameters. (Figure 4)

5) Backstop to enable special cleaving capabilities

·The Large Diameter Fiber Cleaver incorporates a backstop on the opposite side of the fiber from the blade. Use of the backstop prevents the fiber from bending away from the blade during cleaving, and enables cleaving using lower tension. This is an effective method to improve cleave quality when cleaving PMF or other fibers with special structures. (Figure 5)

6) Angled cleaving capability

·The CT-106 version of the Large Diameter Fiber Cleaver has an angled cleaving function. For fibers as large as ϕ 800μm, angled cleaves may be produced from 0 degrees up to 15 degrees by applying controlled torsion to the fiber using the CT-106 rotation mechanism. (Figure 6)

Fig. 3. Easy Exchange of Clamp Inserts.

Fig. 4. Optical Fibers with Special Structure.

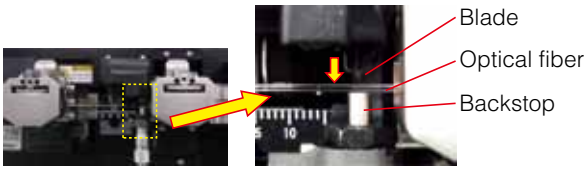

Fig. 5. Backstop Unit.

Fig. 6. Angled Cleaving Unit on CT-106.

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Product specifications are shown in Table 1 and the CT-105/106 cleavers are shown in Figure 7.

Table 1. Specifications of Large Diameter Cleavers.

Item	Specifications	
Model	CT-105	CT-106
Dimensions	240 × 134 × 155 mm	240 × 134 × 162 mm
Weight	3.5 kg	3.8 kg
Applicable Cladding Diameter	80 - 1250 µm	
Applicable Coating Diameter	80 - 3000 µm	
Coating Strip Length	5 - 40 mm	
Cleaving Blade Life	20000 times	
Angled Cleaving Capability	Not Applicable	0 – 15 degrees

Fig. 7. Appearance of Large Diameter Optical Fiber Cleaver.

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