

# Perforated tube fiber protection sleeve

Ultra-Small, 360° full-coverage protection

ARRAYEDFIBEROPTICS  
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## Working principle

### 1) Serious flaws of traditional fiber protection sleeve

Current fiber protection sleeve was invented by Japanese researchers 44 years ago in 1981. There are major flaws in the current fiber protection sleeve. As shown in Figure 1,

- (a) Because the optical fiber does not have its own dedicated space, the hot-melt glue tube flows uncontrollably after melting, causing the optical fiber to bend slightly, resulting in significant additional loss and even fiber breakage.
- (b) The ceramic semi-cylinder is a poor thermal conductor which results in uneven melting of the hot melt glue during the curing process.

### 2) Protection principle of perforated tube fiber protection sleeve

As shown in Figure 2, the new fiber protection sleeve features a hollow metal tube as strength member, offering excellent thermal conductivity. During operation, the optical fiber passes through the hollow tube. The plastic in the heat-melting tube melts into a liquid, which is then squeezed into the tube through the through-holes by the heat shrink tubing, refilling the hollow tube and enveloping all the optical fibers. This "protective cage" provides 360° protection for the optical fiber, with a high degree of symmetry.

Figure 1 shows the operating principle of the current fiber protection sleeve;

Figure 2 shows the operating principle of the perforated tube fiber protection sleeve;

Figure 3 shows photos of the perforated tube fiber protection sleeve;

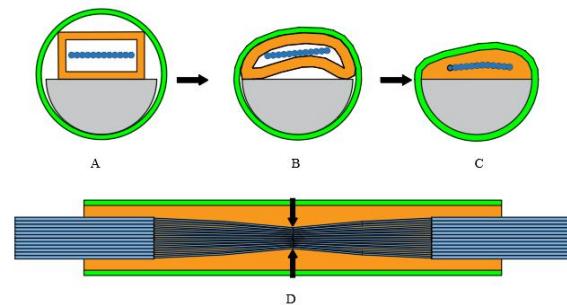


Figure 1: The ceramic fiber protection sleeve

A: Before shrinking  
B: During shrinking  
C: After shrinking  
D: After shrinking(fibers bundle together)

The spliced fiber experiences micro-bending, significant additional loss and even fiber breakage.

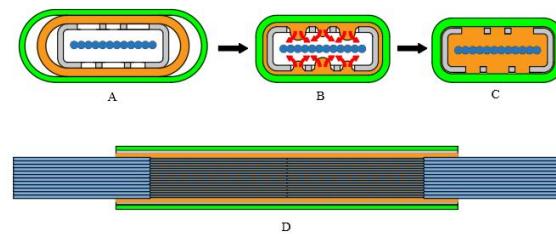


Figure 2: The perforated tube fiber protection sleeve

A: Before shrinking  
B: During shrinking  
C: After shrinking  
D: After shrinking

The spliced fiber experiences little additional loss and is well protected by a rigid cage.



III



The actual product after protection

II



Perforated tube fiber protection sleeve (ribbon fiber)

I



Perforated tube

Figure 3: The perforated tube fiber protection sleeve

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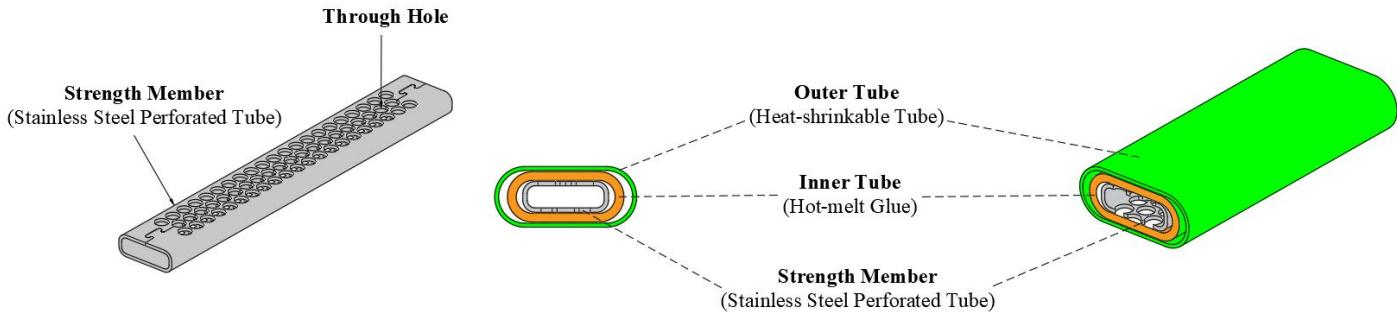
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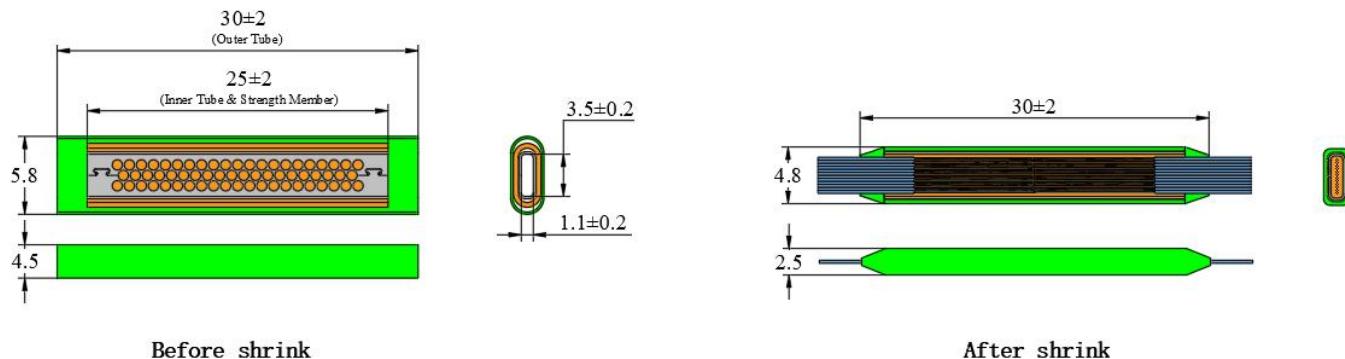
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## Product Structure



## Product Size



## Product Feature

- The optical fiber has its dedicated space, and additional insertion loss due to protection is minimized;
- The optical fiber is protected by a "cage" that provides 360° all around protection. External force cannot be transmitted into it, and squeezing the protection tube will not affect the fiber inside;
- Through hole pattern can precisely control the flow behavior of the hot-melt glue;
- The perforated tube protection sleeve is much smaller and takes up minimum space;
- Low production cost is achieved;

## Product Specifications

PARAMETER	VALUE
Outer tube	Polyolefin based on Polyethylene
Inner tube	Ethylene-Vinyl Acetate
Strength member	Stainless steel
Weight	0.5 g/pcs
Packaging	50 Pack
Heating conditions	Not less than 150°C/50s
Operation temperature(after shrink)	-40°C to 85°C
Storage condition(before shrink)	-40°C to 60°C
Free of hazardous substances according to RoHS 2011/65/EU.	

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