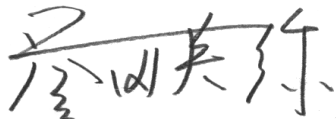


Messieurs;

S p e c i f i c a t i o n
for
200/250 μ m H-PCF
Fiber Optic Short Link Cables

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1. General

1-1. Scope

This specification covers the SUMIGUIDE^{*1} 200/250 μ m H-PCF (Hard Plastic Clad Silica Optical Fiber) cords and cables for short / medium distance data communication applications.

*1 Registered Sumitomo Electric Industries Trademark

1-2. Types and Product Codes

The types and product codes of cords and cables shall be in accordance with Table 1, Table 2 and Table 3, respectively.

Table 1 2 Optical Fibers Cord for Inside-the-Board Use

Type	Product Code
2 H-PCF Cord	DLV-HS-20/06

Table 2 Reinforced Cable

Type	Product Name	Product Code
2 H-PCF Reinforced Cable for Indoor Use	2-FOD-V	1 × DLV-HS-20/06

Table 3 Assembled Cable

Type	Product Name	Product Code
2 H-PCF Cable	2-D-	1 × DLV-HS-20/06
4 H-PCF Cable	4-D-	2 × DLV-HS-20/06
6 H-PCF Cable	6-D-	3 × DLV-HS-20/06
8 H-PCF Cable	8-D-	4 × DLV-HS-20/06
10 H-PCF Cable	10-D-	5 × DLV-HS-20/06

the letter corresponds to shows the material of the cable as below

V :Polyvinyl sheath (Indoor use)

LAP :LAP sheath (Outdoor use, Water proof)

Notice : Assembled Cables are recommended for long length cable (longer than 200m) or high tension laying procedure. LAP cables are recommended for submerged use such as the case being laid in under ground pipes.

2.Constructions

2-1 2 Optical Fibers Cord for Inside-the-Board Use

The construction of the optical fiber cord shall be in accordance with Table 4 and Fig.1 .

Table 4 Construction of 2 H-PCF Cord

No.	Item		Specification
	Type		2 H-PCF Cord
	Product Code		DLV-HS-20/06
	Fiber Type		Hard Plastic Clad Silica Optical Fiber (H-PCF)
	Core	Material	Silica Glass
		Outer Diameter	$200 \pm 5 \mu\text{m}$
		Non-circularity	less than 6%
	Clad	Material	Fluoroacrylate
		Outer Diameter	$250 \pm 5 \mu\text{m}$
		Concentricity error	less than $10 \mu\text{m}$
Theoretical NA (Numerical Aperture)			approximately 0.46
	Protective Coating	Material	ETFE
		Outer Diameter	$0.5 \pm 0.1\text{mm}$
Strength Member			KEVLAR *1 or other suitable aromatic - polyamide
	Outer Jacket	Material	Heatproof PVC (Polyvinylchloride)
		Inner Diameter	approximately 1.6mm
		Outer Diameter	$2.8 \pm 0.2\text{mm}$
Approximate Net Weight			7kg/km
Optical Fiber Identification			Colors of Protective Coating (Blue and Yellow)

*1 Registered E.I.Dupont trademark

NOTICE: 2 H-PCF Cords have continuous marking on their surface of the Outer Jacket as below.

 SUMITOMO OPTICAL FIBER CABLE 200/250 HS

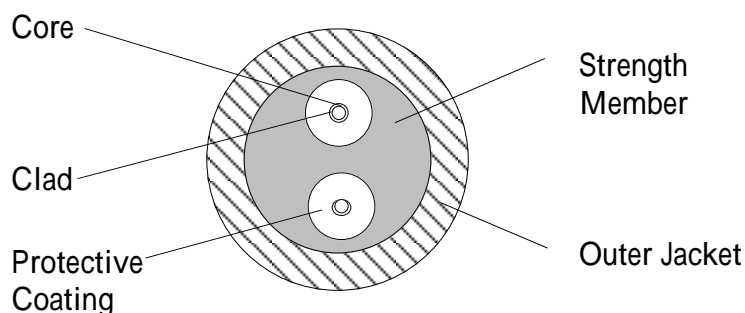
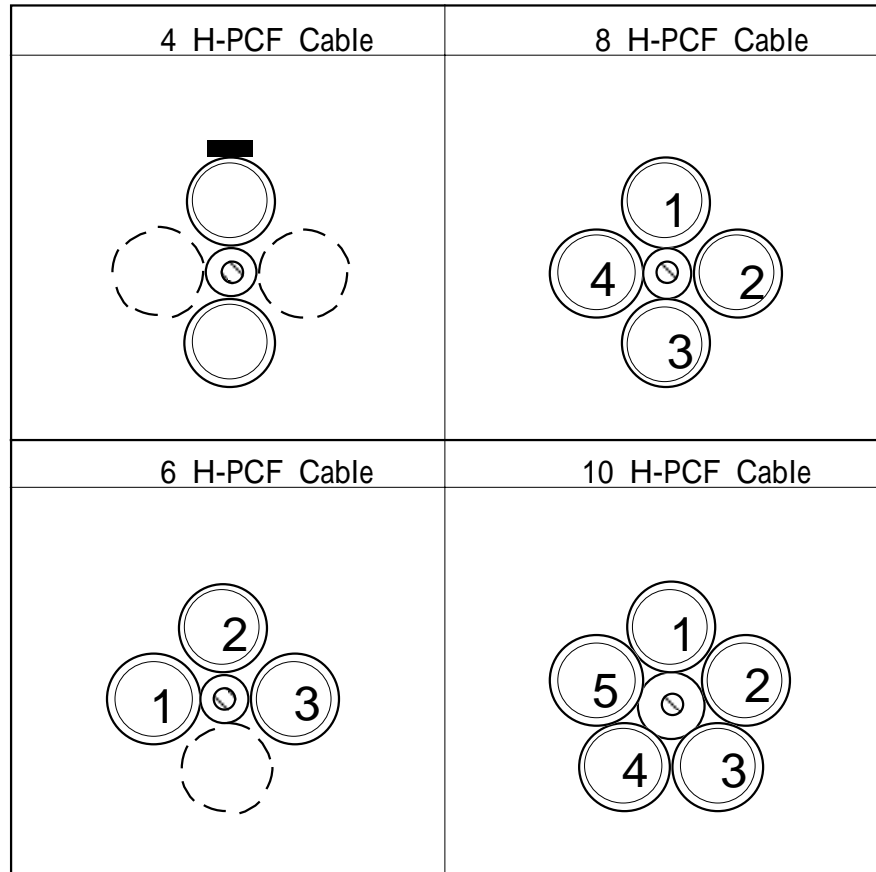


Fig.1 Construction of Optical Fiber Cord

2-2 Optical Fiber Cable

The constructions of optical fiber cables shall be in accordance with Fig.2 and attached tables.



○ : Optical Fiber Cord ○ : String Filler
 ■ : Dot Marking 1 ~ 5 : Numbering

Fig.2 Cable Core Identification

2-3. Color of Sheath


The standard colors of the sheaths are described below.

2 H-PCF cord : Yellow
 Reinforced optical fiber cable : Orange
 Other cables : Black (if otherwise specified)

2-4. Cable Identification

The marking shown in Table 5 shall be indicated to the cable.

Table 5 Cable Identification

Sheath Type	Identification Marking
Polyvinyl	Continuous marking on the Outer Jacket of 2 H-PCF Cord as below.  SUMITOMO OPTICAL FIBER CABLE 200/250 HS
LAP	The manufacturer's name or it's abbreviation and production year shall be indicated to the cable by a suitable method.

3. Permissible Rating

The permissible rating of optical fiber cord and cables shall be in accordance with Table 6.

Table 6 Permissible Rating

Item		Description	Unit	Condition
Storage Temp		-40 ~ 70		
Operational Temp.		-20 ~ 70		
Maximum Tensile Load	Cord	196	N	by careless handling (short term)
	Cable	*1	N	
Minimum Radius Bend	Cord	15	mm	by careless handling (short term)
	Cable	*1		
	Cord	45		being laid (long term)
	Cable	*1		
Crush Resistance	Cable	*1	N/50mm	by careless handling (short term)

*1 See attached table

4. Characteristics

4-1. Optical Characteristics

The optical characteristics of H-PCF optical fiber shall be in accordance with Table 7 and Table 8.

Table 7 Optical Characteristic

No.	Item	Min.	Std.	Max	Unit	Conditions
1	Numerical Aperture		0.46			Calculated value
2	Attenuation		5.0	6.0	dB/km	Lf=1km, =0.8 μ m band, Ta=25
3	Low Temp. Loss Increase		+1.0	+2.0	dB	Lf=1km, =0.85 μ m, Ta=-20 Increase from normal value (at 25)
4	Bandwidth		10		MHz· km	Lf 1km, =0.85 μ m (LED), Ta=25 , Injection NA=0.25(90%FFP)

Lf : Fiber length, : Wavelength of light source, Ta : Temperature

Table 8 Optical Characteristic (Lf < 1km)

No.	Item	Property	Unit	Condition
2	Attenuation	Lf(6-4logLf)	dB	0.1km Lf < 1km
		1.0		Lf < 0.1km
				=0.8 μ m band, Ta=25

5. Connetors

F08 Type duplex optical fiber connectors prescribed by JIS C 5977 shall be used for fiber connection.

6. Tests

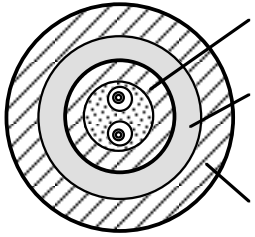
The following routine tests shall be made on the completed optical fiber cord or cables at manufacturer's works.

Table 9 Tests

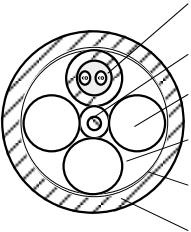
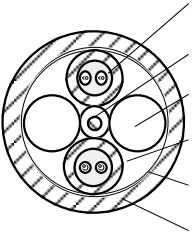
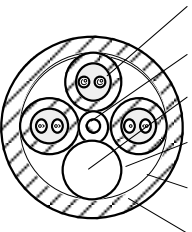
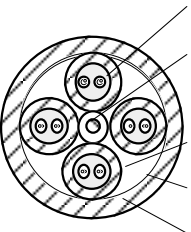
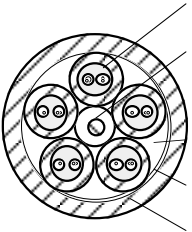
No.	Item	Property	Sampling	Test Method
1	Clad Diameter	As shown in Table 4,5 and attached Table	1 sample per same manufactured unit	Inspection with microscope
2	Sheath Thickness			JIS C 3005 Par.5
3	Cord/Cable Outer Diameter			
4	Optical Attenuation	As shown in Table 7,8	Each reel of cable*1	Cut Back Method (0.8 μ m band)

*1 In case of cord and cable with the length less than 500m, the 'sampling' for the optical attenuation test shall be '1 sample per same manufactured unit'.

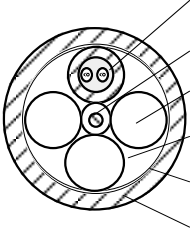
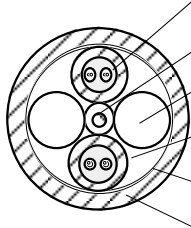
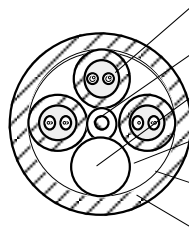
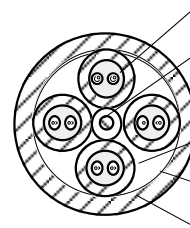
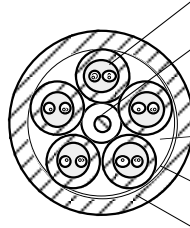
Attached Table 1

No.	Product Name		2-FOD-V
	Number of Optical Fibers		2
	Construction		
Optical Fiber Cord		See Fig. 1	
Filler		Plastic yarn	
Sheath	Material (Color)		Heat Proof PVC (Orange)
	Thickness		approximately 1.0mm
Cable Diameter		$6.0 \pm 0.5\text{mm}$	
Approximate Net Weight		30kg/km	
Maximum Tensile Load		<196N	
Minimum Radius Bend	by careless handling (short term)		>25mm
	being laid (long term)		>50mm
Crush Resistance		490N/50mm	

Attached Table 2 Assembled Cables (Polyvinyl Sheath, Indoor Use)

No.	Cable Type		2 H-PCF Cable	4 H-PCF Cable	6 H-PCF Cable	8 H-PCF Cable	10 H-PCF Cable
	Product Name		2-D-V	4-D-V	6-D-V	8-D-V	10-D-V
	Number of Optical Fibers		2	4	6	8	10
	Construction						
Optical Fiber Cord			See Table 4				
Central Strength Member	Material		Plastic Coated Steel Wire				
	Outer Diameter		1.5mm			2.4 mm	
Filler Cord			Plastic Cord			-	
Filler			Plastic Yarn or Fiber String				
Tape			Plastic				
Sheath	Material (Color)		Heat Proof PVC(Black)				
	Thickness		Approx. 1.2 mm				
Cable Outer Diameter			10.0 ± 1.0 mm			9.6 ± 1.0 mm	10.5 ± 1.0 mm
Approximate Net Weight			100 kg/km				
Maximum Tensile Load			<735 N				
Minimum Radius Bend	by careless handling (short term)		>50 mm				
	being laid (long term)		>100 mm				
Crush Resistance			980 N/50mm				

Attached Table 3 Assembled Cables (LAP Sheath, Outdoor Use, Water Proof)

No.	Cable Type		2 H-PCF Cable	4 H-PCF Cable	6 H-PCF Cable	8 H-PCF Cable	10 H-PCF Cable
	Product Name		2-D-LAP	4-D-LAP	6-D-LAP	8-D-LAP	10-D-LAP
	Number of Optical Fibers		2	4	6	8	10
	Construction						
Optical Fiber Cord		See Table 4					
Central Strength Member	Material	Plastic Coated Steel Wire					
	Outer Diameter	1.5mm				2.4 mm	
Filler Cord		Plastic Cord				-	
Filler		Plastic Yarn or Fiber String					
Tape		Plastic					
Sheath	Material (Color)	LAP Sheath (Black)					
	Thickness	Approx. 1.2 mm					
Cable Outer Diameter		10.9 ± 1.0 mm				10.5 ± 1.0 mm	11.4 ± 1.0 mm
Approximate Net Weight		100 kg/km					
Maximum Tensile Load		<735 N					
Minimum Radius Bend	by careless handling (short term)	>50 mm					
	being laid (long term)	>100 mm					
Crush Resistance		980 N/50mm					