

JIS

JAPANESE INDUSTRIAL STANDARD

F01 Type Connectors for Optical Fiber Cords

JIS C 5970—1987

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In the event of any doubt arising,
the original Standard in Japanese is to be final authority.

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F 01 Type Connectors for Optical Fiber Cords

C 5970-1987

1. Scope

This Japanese Industrial Standard specifies, based on JIS C 5962, F 01 type connectors for optical fiber cords, hereinafter referred to as "optical connectors", applicable for quartz multi-mode optical fibers, multi-constituent multi-mode optical fibers and quartz single-mode principally used in main optical transmission lines.

- Remarks 1. The F 01 type optical connector is an optical connector equipped with screw (M 8 x 0.75) clamp, of a type having such systems that are, ① optical engagement system: butt joint system; ② mechanical engagement system: plug-adaptor-plug system and ③ optical fiber array system: ferrule system (outside diameter ϕ 2.5 mm).
2. The units and numerical values shown in { } in this Standard are based on traditional unit system and are currently the criteria in force.

2. Definitions

For the purpose of this Standard, the definitions of JIS C 5962 shall apply.

3. Structure of Type Designation

The structure of type designation shall be as specified in 3.1 of JIS C 5962.

Applicable Standards:

JIS C 5961-Test Methods for Connectors for Optical Fiber Cords

JIS C 5962-General Rules of Optical Connectors for Glass Fiber Cords

JIS C 6820-General Rules of Optical Fibers

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4. Classification and Grading

4.1 Class The classes (type designation) of optical connectors shall be as given in Table 1.

Table 1. Classification of Optical Connector

Type designation	Shape of optical connector	Shape of ferrule array	Grade	Applicable optical fiber cord JIS C 6820	Shape and dimension	
CN F01 SPM 123 B 11	Plug	M	B	OFC 2.8-Y-S SM-10/125	Attached Fig. 1	
CN F01 SPM 124 B 11						
CN F01 SPM 125 B 11						
CN F01 SPM 126 B 11						
CN F01 SPM 127 B 11						
CN F01 SPM 128 B 11						
CN F01 SPM 129 B 11			C	OFC 2.8-Y-S SM-10/125	Attached Fig. 2	
CN F01 SPM 123 C 11						
CN F01 SPM 124 C 11						
CN F01 SPM 125 C 11						
CN F01 SPM 126 C 11						
CN F01 SPM 127 C 11						
CN F01 SPM 128 C 11			F	OFC 2.8-Y-S GI-50/125	Attached Fig. 3	
CN F01 SPM 129 C 11						
CN F01 SPM 124 F 11						
CN F01 SPM 126 F 11						
CN F01 SPM 128 F 11						
CN F01 SPM 130 F 11			C		Attached Fig. 4	
CN F01 SPM 123 C 12						
CN F01 SPM 124 C 12						
CN F01 SPM 125 C 12						
CN F01 SPM 126 C 12						
CN F01 SPM 127 C 12						
CN F01 SPM 128 C 12			F		Attached Fig. 5	
CN F01 SPM 129 C 12						
CN F01 SPM 124 F 12						
CN F01 SPM 126 F 12			C		Attached Fig. 6	
CN F01 SPM 128 F 12						
CN F01 SPM 130 F 12						
CN F01 PAFB	Adapter	F—F	B	—	Attached Fig. 6	
CN F01 PAFC			C			

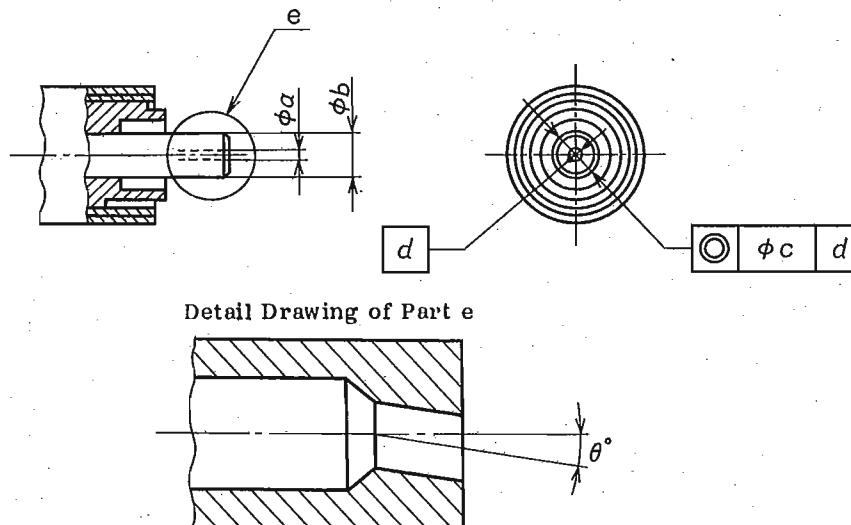
4.2 Grade The grades of optical connectors shall be as follows:

(1) Plug The grades of plugs shall be as given in Table 2.

Table 2. Grading of Plug

Grade	Insertion loss dB ⁽¹⁾		Dimensions of ferrule mm			Angle θ°
	OFC 2.8-Y-SSM-10/125	OFC 2.8-Y-SGI-50/125	Tolerances on dimension a	Dimension b	Dimension c	
B	1.0 max.	—	+0.001 0	2.499 ± 0.000 5	0.001 4 max.	0.5 max.
C	—	0.6 max.		2.499 ± 0.001	0.004 max.	
F	—	1.5 max.	+0.002 0	2.499 ^{+0.001} _{-0.002}	0.01 max.	1.0 max.

Note ⁽¹⁾ The value when the plug is connected with the master optical connector is shown.



(2) Adapter The grades of adapters shall be as given in Table 3.

Table 3. Grading of Adapter

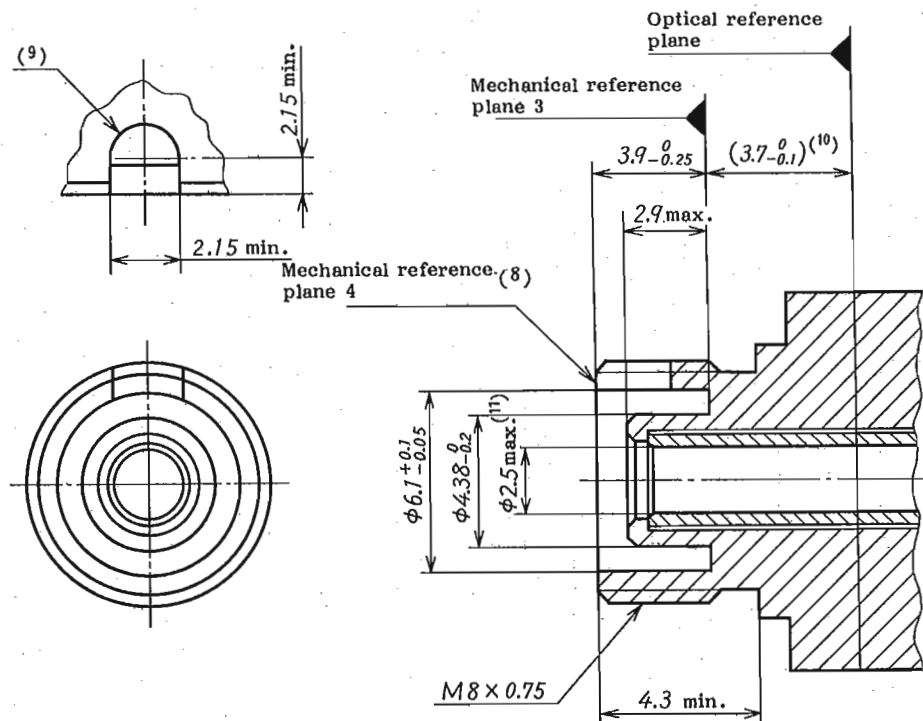
Grade	Insertion loss dB ⁽¹⁾	
	OFC 2.8-Y-SSM-10/125	OFC 2.8-Y-SGI-50/125
B	1.0 max.	—
C	—	0.6 max.

5. Construction

The construction, shapes and dimensions of optical connectors shall be as shown in Figs. 1 and 2. The dimensions of individual connector shall be as given in Attached Figs. 1 to 6 as specified in Table 1. If the dimensions are specified in Figs. 1 or 2 and also in any one of Attached Figs. 1 to 6, the later has precedence.

Fig. 2. Joint of Optical Connector (Adapter)

Unit: mm



Notes ⁽⁸⁾ Mechanical reference plane 3 and mechanical reference plane 4 are the mechanical reference planes corresponding to mechanical reference plane 1 and mechanical reference plane 2 given in the joint of plug (Fig. 1), respectively.

⁽⁹⁾ This shape may be other than R form.

⁽¹⁰⁾ This dimension is the designed distance from mechanical reference plane 3 to the ferrule end plane in the adapter when the adapter is under optical connection being engaged with the plug, and it is not subjected to the measurement.

⁽¹¹⁾ This dimension is that when an elastic sleeve is used, and it shall be larger than $\phi 2.5$ when a non-elastic sleeve is used.

6. Performances

The performances shall be as given in Table 4.

Table 4. Performance

No.	Item	Test method JIS C 5961	Conditions to be applied	Performance
1	Fitting	4.3	—	Engagement without mechanical abnormality.
2	Insertion loss	5.1	Kind of optical fiber cord to be used: As specified in Table 1. Kind of light source: Multi-mode optical fiber: A or B Single-mode optical fiber: E or F Measuring method: Method 1 or method 3 (for plugs) Method 4 (for adapters)	To comply with Tables 2 and 3.
3	Resistance to vibration	6.1	Initial measurement item: Insertion loss Test method: Sweeping endurance test Severity: Vibration frequency range: 10 to 55 Hz Amplitude (one side) 0.75 mm Number of sweeping cycles 24 Test conditions: 24 cycles (48 cycles in total) on each of two axes including fitting axis. Final measurement item: Insertion loss, mechanical damage	Insertion loss (initial measurement value): To comply with Tables 2 and 3. Insertion loss (final measurement value): To comply with Table 5. Mechanical damage: No detrimental damages such as deformation, crack and loosening shall appear.

Table 4 (Continued)

No.	Item	Test method JIS C 5961	Conditions to be applied	Performance
4	Resistance to shock	6.2	Initial measurement item: Insertion loss Severity: Peak acceleration 981 m/s² (100 G) Duration: 6 ms Velocity change: Half-sine wave 3.7 m/s or Saw tooth wave 2.9 m/s Test condition: 3 times (12 times in total) in each of both directions on two axes including fitting axis Final measurement item: Insertion loss, mechanical damage	Insertion loss (initial measurement value): To comply with Tables 2 and 3. Insertion loss (final measurement value): To comply with Table 5. Mechanical damage: No detrimental damages such as deformation, crack and loosening shall appear.
5	Repetitive operation	6.3	Initial measurement item: Insertion loss Number of repeated operations: 500 Final measurement item: Insertion loss	Insertion loss (initial measurement value): To comply with Tables 2 and 3. Insertion loss (final measurement value): To comply with Table 5.
6	Gage retension force of adapter	6.4	Detail of gage: $\phi 2.499 \pm 0.0005$ mm	Gage retension force: 2.9 N {0.30 kgf} to 5.9 N {0.60 kgf}

Table 4 (Continued)

No.	Item	Test method JIS C 5961	Conditions to be applied	Performance
7	Ferrule pressure	6.5	Measurement position: Optical reference plane (see Fig. 1)	Ferrule pressure: 7.8 N {0.80 kgf} to 11.8 N {1.20 kgf}
8	Strength of connection at joint	6.6	Applicable optical fiber cord Kind: As specified in Table 1. Length: 1 to 2 m Initial measurement item: Insertion loss Tensile force: 147 N {15 kgf} Final measurement item: Insertion loss, mechanical damage	Insertion loss (initial measurement value): To comply with Tables 2 and 3. Insertion loss (final measurement value): To comply with Table 5. Mechanical damage: No detrimental damages such as deformation, crack and loosening shall appear.
9	Robustness of optical fiber cord clamp (tension in axial direction)	6.11	Applicable optical fiber cord Kind: As specified in Table 1. Length: 1 to 2 m Initial measurement item: Insertion loss Final measurement item: Insertion loss, mechanical damage	Insertion loss (initial measurement value): To comply with Tables 2 and 3. Insertion loss (final measurement value): To comply with Table 5. Mechanical damage: No detrimental damages such as deformation, crack and loosening shall appear.