

Calsak Corporation

Specification Sheet

GHAN 4001-OR1

Polyamide Jacketed
Optical Fiber Cable

High – Performance Plastic Optical Fiber
Eska™

MITSUBISHI RAYON CO., LTD.

ESKA OPTICAL FIBER DEPARTMENT

6-41, Kounan 1-Chome, Minato-Ku, Tokyo, 108-8506 Japan

Phone : +81-3-5495-3060

Facsimile : +81-3-5495-3212

1. Scope

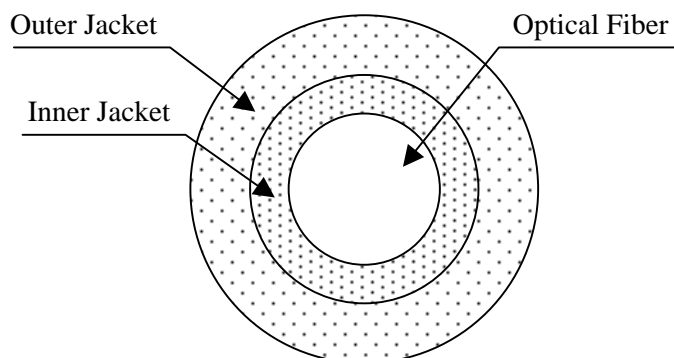
This specification covers basic requirements for the structure, optical and mechanical performances of GHAN4001-OR1.

2. Structure of fiber optic cable

Table 1

Items		Specification			
		Unit	Min.	Typ.	Max
Fiber core	Material	-	Poly(methyl methacrylate)		
	Refractive index [n_D^{20}]	-	1.482	1.492	1.502
	Diameter	μm	935	980	1,025
Cladding	Material	μm	Fluorinated polymer		
	Thickness	μm	8	-	-
Fiber	Diameter	μm	955	1,000	1,045
Inner jacket	Base material	-	Polyamide 12		
	Additional material	-	(Without flame retardant material)		
	Color	-	Black due to carbon		
	Diameter	mm	1.47	1.51	1.55
	Concentricity to the fiber	mm	-	-	0.06
Outer jacket	Material	-	Modified Polyamide		
	Color	-	Orange		
	Diameter	mm	2.23	2.30	2.37
	Concentricity to the fiber	mm	-	-	0.10
Cable	Weight	kg/km	-	-	5
	Number of fibers in the cable	-	1(simplex)		

Sectional View



3. Properties

3.1 Optical properties

Table 2

	Acceptance criterion and/or [Test condition]		Specification			
			Unit	Min.	Typ.	Max
Items	Condition 1 [70 , 10h]					
	[Wavelength (nm)]	620	dB/m	-	-	0.49
		630		-	-	0.42
		635		-	-	0.35
		640		-	-	0.25
		650		-	-	0.19
		660		-	-	0.24
		670		-	-	0.32
		680		-	-	0.34
		690		-	-	0.37
	Condition 2 [85 , 85%RH, 50h]					
	[Wavelength (nm)]	620	dB/m	-	-	0.52
		630		-	-	0.44
		635		-	-	0.35
		640		-	-	0.25
		650		-	-	0.20
		660		-	-	0.27
		670		-	-	0.34
680		-		-	0.36	
690		-		-	0.39	
Numerical Aperture ¹⁾	[Wavelength (nm)]	650 ± 25	-	0.45	0.50	0.55
Refractive Index Profile	-		-	Step Index Type		
Bandwidth	[Fiber length : 20m] [DIN EN 188000 PV304]		MHz	50	-	-
Optical insulation (Stray light : Cross talk)	Relative difference of luminous power between fiber and cable		dB	30	-	-

3.2 Mechanical properties of the cable

Table 3

Items		Acceptance criterion and/or [Test condition]	Specification			
			Unit	Min.	Typ.	Max
Adhesion Strength	Inner jacket to fiber	[Stripping length ; 30mm]	N	50	-	-
	Outer jacket to inner jacket	[Stripping length ; 30mm]	N	10	20	30
Tensile performance		[Tensile force ; 60N]	%	-	-	2.5
Flexural strength (Resistance to bending)		Gradient of force over distance	N/mm	10	-	18
Bending radius		Allowed bending radius over lifetime	mm	25	-	-
		Allowed bending radius for short time	mm	10	-	-
Shrinking		[85 , 24h]	%	-	-	0.6
Pistoning		Between Fiber and Inner Jacket [90 , 24h]	mm	-	-	0.03
		Between Inner and Outer Jacket [90 , 24h]	mm	-	-	0.50

3.3 Properties of the cable materials

Table 4

Items	Acceptance criterion and/or [Test condition]	Specification
Hydrolysis	Visual inspection [85 , 85%RH, 720h]	No deterioration observed
Flame retardance	Extinguish time (DIN 72551-5)	Within 30 second

4. Durability

4.1 Mechanical stress resistance

Table 5

Items	Acceptance Criterion and/or [Test condition]		Specification			
			Unit	Min.	Typ.	Max
Static bending	[Fiber length ; 10m]	New sample	dB	-	-	+0.2
	[Bend radius ; 20mm] [Bend angle ; 360deg.]	Aged sample [85 , 85%,1000h]	dB	-	-	+0.2
Impact	[Fiber length ; 3m] [Number of impact ; 1 time] [Impact energy = 0.1Nm (100g*100mm)]		dB	0 ^{i 2)}		
Constant elongation	Sample ; Fiber with inner jacket [3m] [Length subjected to tensile stress ; 0.5m] [Elongation ; 3% , 96h]		dB	-	-	+0.2
Isotactic pressure (Lateral compression)	[Fiber length ; 3m] probe ; DIN 72551, part 5	[Temp. ; 23] [Force ; 70N]	dB	-	-	+0.8
		[Temp. ; 85] [Force ; 13.5N]		-	-	+0.5
		[Temp. ; 85 , 80%RH] [Time ; 240h] [Force ; 20N]		-	-	+0.4
Repeated torsion	[Fiber length ; 3m] [Turn ; 10,000times, ± 270deg.] [Temp. ; -20] [Weight ; 500g]		dB	-	-	+0.1
Tensile strain at bending point	Test sample ; New sample & Aged sample [85 , 85%,1000hrs]					
	[Fiber length ; 3m] [Length subjected to tensile stress ; 1m] [Radius ; 20mm] [Angle; 180deg.] [Force; 60N] [Elongation; 3%] [Time ; 60min]		dB	-	-	+0.8
Repeated bending	[Fiber length ; 10m]	[Temp. ; 23]	dB	-	-	+0.2
	[Radius ; 15mm] [Angle ; ± 90deg.] [Weight ; 500g]	[Cycle ;10,000] [Temp. ; -20] [Cycle ;1,000]		-	-	+0.2
Abrasion	[Fiber length ; 1m] [Cycle ; 500] [Temp. ; RT] [DIN 72551, part5]		dB	0 ^{i 2)}		

4.2 Climatic resistance

Table 6

Items	Acceptance Criterion and/or [Test condition]	Specification			
		Unit	Min.	Typ.	Max
Temperature	[-40 , 3000h]	dB/10m	-	-	+0.1
	[85 , 6000h]		-	-	+0.3
	[85 , 85%RH, 3000h] Reversible attenuation rise		-	-	+0.4
	[85 , 85%RH, 3000h] After conditioning in dry air		-	-	+0.2

Note

- 1) Measured by FFP (Far Field Pattern, Fiber length = 2m)
and defined by the full width at 50% maximum.
- 2) 0ⁱ dB means no attenuation rise within measurement tolerance.

Revision Record

Product Type	GHAN 4001-OR1		Specification No.	B3HG-05
Revision No.	Revised Date	Revised Point	Cause of Revision	
1	2003/2/21	Newly Issued		