

AS5382/4

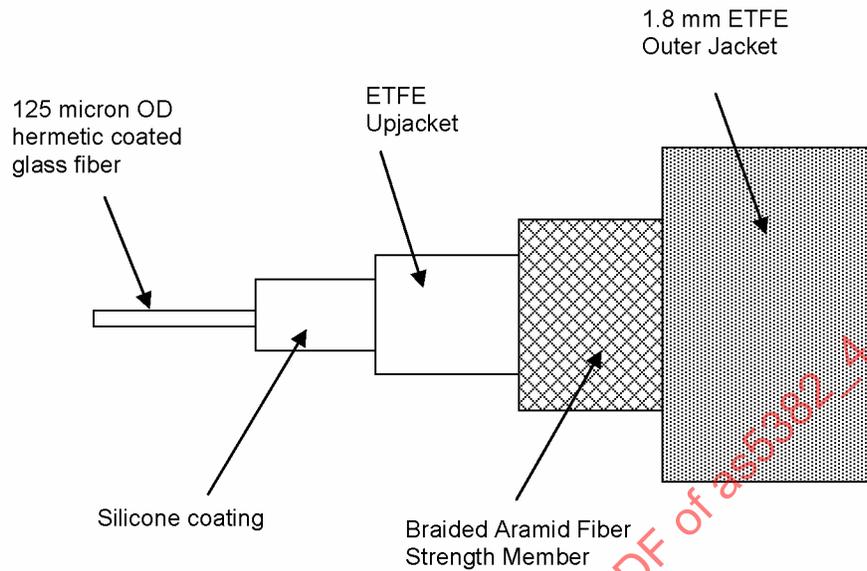


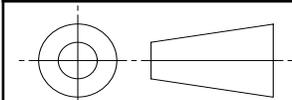
FIGURE 1 - CABLE CONFIGURATION

1. Construction Description

1.1 Optical Fiber Dimensions and Materials

Core Diameter:	4.6 μm nom. (0.00018 in)
Mode Field Diameter @ 1310 nm:	5.1 $\mu\text{m} \pm 1.0 \mu\text{m}$ (0.00020 in \pm 0.00004 in)
Mode Field Diameter @ 1550 nm:	5.8 $\mu\text{m} \pm 1.0 \mu\text{m}$ (0.00023 in \pm 0.00004 in)
Core Material:	Step Index Silica Glass
Cladding Diameter:	125 $\mu\text{m} \pm 2 \mu\text{m}$ (0.0049 in \pm 0.00008 in)
Cladding Material:	Silica Glass
Core to Cladding Ellipticity:	2% maximum
Core to Cladding Offset:	1 μm maximum
Hermetic Coated:	Yes
Coating Diameter:	450 $\mu\text{m} \pm 25 \mu\text{m}$ (0.0177 in \pm 0.001 in)
Coating Material:	Silicone
Coating Concentricity:	65% minimum

THIRD ANGLE PROJECTION



ISSUED 2004-04

CUSTODIAN: SAE AE-8/AE-8D

SAE Aerospace
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AEROSPACE STANDARD

CABLE, FIBER OPTIC, SINGLE-MODE,
4.6/125/450 μm ,
HERMETIC COATED, TIGHT BUFFER

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1.2 Cable Dimensions and Materials

Upjacket Diameter:	900 $\mu\text{m} \pm 50 \mu\text{m}$ (0.0354 in \pm 0.002 in)
Upjacket Material:	Ethylene-Tetrafluoroethylene Copolymer (ETFE)
Strength Member:	Braided Aramid Fiber
Yarn Size:	380 Denier
Number of Ends:	16
Braid Picks/Inch:	9
Outer Jacket Diameter:	1800 $\mu\text{m} \pm 100 \mu\text{m}$ (0.0709 in max \pm 0.039 in max)
Outer Jacket Material:	Ethylene-Tetrafluoroethylene Copolymer (ETFE)
Outer Jacket Concentricity:	6% of Jacket Outer Diameter

1.3 Cable Performance

Operational Mode:	Single mode
Temperature Rating:	-55 to +165 °C
Storage Temperature:	-55 to +85 °C
Outer Jacket Color:	Yellow
Finished Cable Weight:	4.0 kg/km maximum

2. Optical Fiber Requirements

Maximum Attenuation:	$\leq 1.5 \text{ dB/km @ 1300 nm, } \leq 1.4 \text{ dB/km @ 1550 nm}$
Numerical Aperture:	0.21 ± 0.02
Fiber Tensile Proof Test:	200,000 psi minimum

3. Environmental

Fluid Immersion:	See Table 1 for test fluid listing.
Freezing Water Immersion:	$\leq 0.5 \text{ dB}$ change in optical transmittance during the test with $\leq 0.5 \text{ dB}$ permanent change after test
Humidity Resistance:	$\leq 0.5 \text{ dB}$ change in optical transmittance during the test with $\leq 0.5 \text{ dB}$ permanent change after test
Wicking:	Water Penetration of 88.5 mm maximum
Fungus Resistance:	Fungus inert per MIL-HDBK-454 Guideline 4
Blocking:	No areas of localized adhesion

4. Mechanical

Cold Bend:	$\leq 0.5 \text{ dB}$ change in optical transmittance after test
Cyclic Flex:	$\leq 0.5 \text{ dB}$ change in optical transmittance during the test with $\leq 0.5 \text{ dB}$ permanent change after test Test temps: -55 °C, +25 °C, +150 °C
Impact Resistance:	$\leq 0.5 \text{ dB}$ change in optical transmittance during the test with $\leq 0.5 \text{ dB}$ permanent change after test
Crush Resistance:	$\leq 0.5 \text{ dB}$ change in optical transmittance during the test with $\leq 0.5 \text{ dB}$ permanent change after test

Corner Bend:	≤0.5 dB change in optical transmittance during the test with ≤0.5 dB permanent change after test
Cable Tensile Load and Bending:	≤0.5 dB change in optical transmittance during the test with ≤0.5 dB permanent change after test Maximum tensile load 132 N
Jacket Material Tensile and Elongation:	Tensile Strength: 900 N/cm ² minimum Elongation: 125% minimum
Durability of Manufacturer's Identification:	Required unless identification marking is under a clear jacket
Jacket Strippability:	Easily Removed, No damage to fiber at 10X

5. Thermal

Flammability:	After Flame: 30 seconds maximum Flame Travel: 3 inches maximum Tissue Flaming: None
Thermal Shock:	Temperature Range: -55 to +200 °C Maximum Cable Diameter Change of ±10% ≤0.5 dB change in optical transmittance after test
Property Retention After Thermal Aging:	750 h at 180 °C 300 h at 200 °C 100 h at 220 °C Maximum Cable Diameter Change of ±10% ≤0.5 dB change in optical transmittance after test jacket tensile and elongation: 75% of initial value
Storage Life:	Temperature Range: -55 to +85 °C No Visual Damage at 10X Magnification ≤0.5 dB change in optical transmittance after test
Temperature Cycling:	5 cycles, temperature range: -55 to +165 °C Maximum Cable Diameter Change of ±10% ≤0.5 dB change in optical transmittance during the test with ≤0.5 dB permanent change after test
Temperature Cycling With Mandrel:	5 cycles, temperature range: -55 to +165 °C Wrapped 5 times around a 0.75 inch mandrel Maximum Cable Diameter Change of ±10% ≤0.5 dB change in optical transmittance during the test with ≤0.5 dB permanent change after test
Jacket Shrinkage:	2.3 mm maximum in a 360 mm sample