

**Specification For  
Non Zero  
Dispersion Shifted  
Single Mode Optical Fiber  
(G.655)**

**ISSUED : April 01, 2004**  
**SPEC NO. : CS04(10-01)C**  
**REV. : 00**





## Description

This Specification covers an uncoloured Non Zero Dispersion Shifted Single Mode fibre used to carry high bit rate optical signals including DWDM signals.

Optical fibres are made of synthesized silica with a coating of 245  $\mu\text{m}$  mechanically strippable UV cured acrylate.

Product name: NZDS SM Optical Fibre (G.655)

Product code:

## Specification

### Attenuation Coefficient:

Between 1525-1625 nm  $\leq 0.25$  dB/km

Between 1565-1625 nm  $\leq 0.28$  dB/km

Attenuation discontinuities at 1550nm  $\leq 0.05$  dB

Attenuation coefficient at water Peak (at  $1385 \pm 3$  nm)  $\leq 1.00$  dB/km

**Cutoff wavelength**  $< 1550$  nm

**Mode field diameter**  $9.0 \pm 0.7$   $\mu\text{m}$  at 1550 nm

### Dispersion

a) Chromatic Dispersion coefficient in 1530-1565 nm band:

i)  $\lambda_{\text{min}}$  and  $\lambda_{\text{max}}$  1530 nm and 1565 nm

ii) Minimum value of  $D_{\text{min}}$  1.0 ps/nm.km

iii) Maximum value of  $D_{\text{max}}$  10.0 ps/nm.km

iv)  $D_{\text{max}} - D_{\text{min}}$   $\leq 5.0$  ps/nm.km

v) Sign Positive

b) Chromatic Dispersion coefficient in 1565-1625 nm band:

i)  $\lambda_{\text{min}}$  and  $\lambda_{\text{max}}$  1565 nm and 1625 nm

ii) Minimum value of  $D_{\text{min}}$  4.0 ps/nm.km

iii) Maximum value of  $D_{\text{max}}$  14.0 ps/nm.km

iv) Sign Positive

Dispersion Slope  $< 0.07$  ps/(nm<sup>2</sup>.km)





- c) Polarization Mode Dispersion at 1550 nm
- |  |   |
|--|---|
| i) Individual Fibre                              | $\leq 0.20 \text{ ps}/\sqrt{\text{km}}$ |
| ii) Cabled Fibre PMD for 90% of fibre in a cable | $\leq 0.30 \text{ ps}/\sqrt{\text{km}}$ |
| iii) PMD Link Design Value                       | $\leq 0.10 \text{ ps}/\sqrt{\text{km}}$ |

### Geometries

Cladding Diameter	$125 \pm 1.0 \text{ }\mu\text{m}$
Core Clad Concentricity Error	$\leq 0.8 \text{ }\mu\text{m}$
Cladding Non-Circularity	$\leq 1.0 \%$
Coating Diameter	235-255 $\mu\text{m}$
Coating-Cladding Concentricity Error	$\leq 10 \text{ }\mu\text{m}$
Fibre Curl	$\geq 4 \text{ m radius of curvature}$

### Mechanical Characteristics

Proof Test	1 %
Strippability force to remove secondary coating of fibre	$1.3 \leq F \leq 8.9$
Dynamic Tensile Strength	
Unaged	$> 550 \text{ Kpsi (3.8 Gpa)}$
Aged (Aged at 85 <sup>0</sup> C, 95 % RH for 30 days)	$> 440 \text{ Kpsi (3.0 Gpa)}$
Dynamic Fatigue Parameter	$\geq 20$
Static Fatigue Parameter	$\geq 20$

### Macro Bending Loss

The induced attenuation due to 1 turn of fiber wrapped around a mandrel of 32 mm diameter shall be less than 0.5 dB at 1550 nm

The induced attenuation due to 100 turns of fiber wrapped around a mandrel of 60 mm diameter shall be less than 0.05 dB at 1550 nm





### Environmental Characteristics

Temperature Dependence of Attenuation  
Induced attenuation at  $-60^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$   $\leq 0.05$  dB/km at 1550nm

Temperature Humidity Cycling  
Induced attenuation at  $-10^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ , 95% RH  $\leq 0.05$  dB/km at 1550nm

Water Immersion  
Induced attenuation due to water immersion  
at  $23 \pm 2^{\circ}\text{C}$   $\leq 0.05$  dB/km at 1550nm

Heat Aging  
Induced attenuation due to heat aging  
at  $+85 \pm 2^{\circ}\text{C}$   $\leq 0.05$  dB/km at 1550nm

#### Retention of Coating Colour

Coated Fibre shall show no discernible change  
in colour when aged for Relative Humidity  
30 days at  $85^{\circ}$  (C) and  
95% Humidity  
20 days in dry  $85^{\circ}$  (C)  
heat

### Material Properties

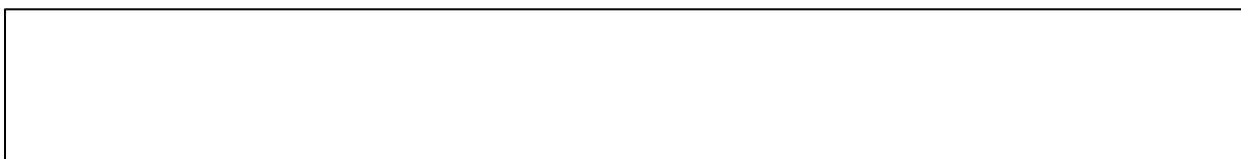
Fibre Glass  
Refractive index profile Core: Refer to Fig. 1

Cladding: Matched cladding

Glass Composition Core: Germania ( $\text{GeO}_2$ ) doped Silica ( $\text{SiO}_2$ )

Cladding: Silica ( $\text{SiO}_2$ )

Primary Coating 2 layers of UV curable resin





## Shipping Information

### Reel Dimension

Fibre is available with following type of reel.

Max. fibre length: 25.2 km

Flange Diameter:	234.95 mm
Traverse Width:	95 mm
Bore Diameter:	25.45 mm
Barrel Diameter:	152.4 mm

### Reel Length

The reel length is between 2.1 km and 25.2 km with the length distribution as follows

#### Length distribution

25.2 km	$\geq 80 \%$
2.1 to 23.1 km	$\leq 20 \%$

The actual length of each reel shall be more than or equal to contract length.

**Reel Identification** The label with ID number, barcode of ID number, attenuation at 1310 nm and 1550 nm, product code and fibre length shall be attached on each reel  
**Test Report**

Test report for each shipment shall be submitted to the customer in the form of data sheet. Test report shall consist of product name, product code, ID number and the following measured values.

1. Length
2. Attenuation at 1383 nm, 1550 nm, 1565 nm, and 1625 nm
3. Cladding Diameter
4. Core concentricity error
5. Cladding non circularity
6. Coating Diameter
7. Chromatic Dispersion at 1530-1565 nm
8. Chromatic Dispersion at 1565-1625 nm
9. Zero dispersion slope
10. Cutoff wavelength
11. Mode field diameter
12. Fibre Curl
13. PMD at 1550 nm



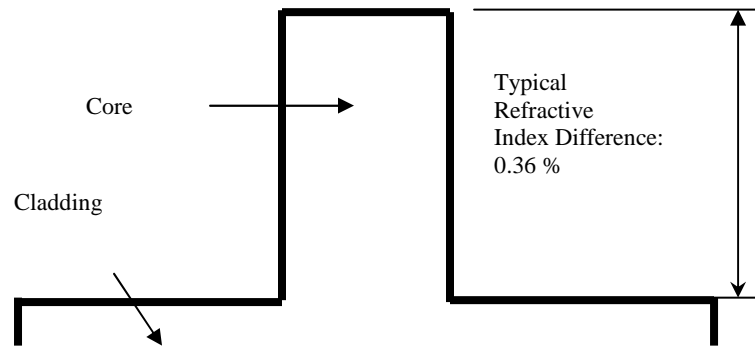


Fig. 1: Typical Index Profile of Non Zero Dispersion Shifted Single Mode Fibre

