



BHARAT SANCHAR NIGAM LIMITED

(A GOVT. OF INDIA ENTERPRISE)

TELECOM QUALITY ASSURANCE CIRCLE

(An ISO 9001: 2008 Certified Organization)

II Floor, Sanchar Complex, WMS Compound
Jayanagar 5th Block, 9th Main, 47th Cross, Bangalore-560041

TECHNICAL SPECIFICATION EVALUATION CERTIFICATE

No. TSEC/BG/OFC/040.MAY 2012

Date: 11.05.2012

THIS IS TO CERTIFY THAT THE PRODUCT DESCRIBED BELOW IS APPROVED AND COMPLIES WITH THE TENDER / PURCHASE ORDER SPECIFICATION INDICATED AND IS ISSUED SUBJECT TO THE CONDITIONS STIPULATED IN THE ANNEXURE

PRODUCT : 24F Metal Free Optical Fibre Cable
with double HDPE sheath (G.652 D Fibre)
Type-I (Wet Core) Group-III

MODEL NO : 7117

SPECIFICATION NO.: Section 3 of Technical Spec. of Tender No.
CA/CNP/OFC/T-406/2011-12 Issued on 30.08.2011
Specified in CGMTS Kolkata Tender No.
BSNL/TS/P/2011-12/OFC (UG)/33 dated 15.11.2011

(SOFTWARE VERSION
IF ANY) : NIL

ISSUED ON: 11.05.2012

VALID only for CGMTS
Kolkata Tender No.
BSNL/TS/P/2011-12/OFC (UG)/33
dated 15.11.2011

ISSUED TO: M/s. KEC International Limited,
(Manufacturer) 349 & 350, Hebbal Industrial Area,
Hootagalli, Belavadi Post, Mysore-570 018.

REMARKS: Cross section construction as per Annexure A & details of raw material used as per Annexure B



DIVISIONAL ENGINEER (TSA)
For CGM, TQAC, BG-41

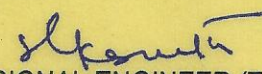
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I. TERMS AND CONDITIONS (For Optical fibre cable)

- i. Telecom Quality Assurance Circle (TQAC) may at any time and at its absolute discretion, for any reason(s) as it deems fit, suspend or cancel the TECHNICAL SPECIFICATION EVALUATION CERTIFICATE (TSEC). TQAC may modify any of the terms of the Certificate or specifications which the holder must at his own expense may comply with.
- ii. **No modification without necessary permission /approval from TQAC is permitted in design (Hardware/Software), Engineering and /or facilities in the approved model subsequent to the issue of this certificate. In case of any modification in the product without permission/approval from TQAC, the certificate shall be deemed to have been cancelled and may need fresh certificate.**
- iii. During the validity of certificate, TQAC reserves the right to inspect and or test this product at any premises where it is in use, or at the place of manufacturer. If any deterioration in performance of the approved product is noticed during inspection and / or testing or its use in BSNL network, the TQAC reserves the right to cancel/suspend the Certificate.
- iv. In case of any dispute at any stage during the validity of this Approval the verdict of the Competent Authority of BSNL QA shall be final and binding on the manufacturer.
- v. The certificate is valid only up to the date mentioned in the certificate and may be renewed, if required, by applying at least three months prior to the expiry date of this certificate. After expiry of the certificate, the case will be treated as a fresh case.
- vi. **Issue of this Approval does not ensure that the BSNL shall necessarily place order on the manufacturer for this product. It merely qualifies the product for meeting the clauses of the relevant Generic Requirement (GR). Actual supply of equipment to BSNL shall depend on their procurement policy and procedures.**
- vii. The manufacturer shall use raw materials in the manufacturing of Optical Fibre Cable from the sources approved by TQAC or its authorized agency only.
- viii. The manufacturer shall use only approved raw materials in the manufacturing of Optical Fibre Cable from the source approved by CACT Bangalore.
- ix. The Optical Fibre Cable may be tested by BSNL as per the requirements of GR, the test schedule of the O.F. cable and raw material used by the manufacturer. Any deviation and change of the raw materials used other than alternate approved sources and/or change in the construction design of the cable shall require fresh approval (TSEC).

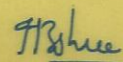
II. Infrastructure Assessment No. CGMQA/TSEC/BG/IA/11-12/075 dated 31.01.2012


DIVISIONAL ENGINEER (TSA)
For CGM, TQAC, Bangalore-41

TO:

1. Sr.DDG, TEC, K.L.Bhavan, Janpath, New Delhi
2. CGM, T & D Circle, BSNL, Jabalpur
3. Sr.GM(MM)/Sr.GM(CN), Bharat Sanchar Bhavan, Harishchandra Mathur Lane, Janpath, New Delhi-01
4. Sr.GM (QA), Bangalore
5. GM (NWP-CDMA WiMAX), BSNL Bharat Sanchar Bhavan, Harishchandra Mathur Lane, Janpath, New Delhi-01
6. DGM (QA), Bangalore
7. Applicant: **M/s. KEC International Limited,
349 & 350, Hebbal Industrial Area,
Hootagalli, Belavadi Post, Mysore-570 018.**
8. Office copy



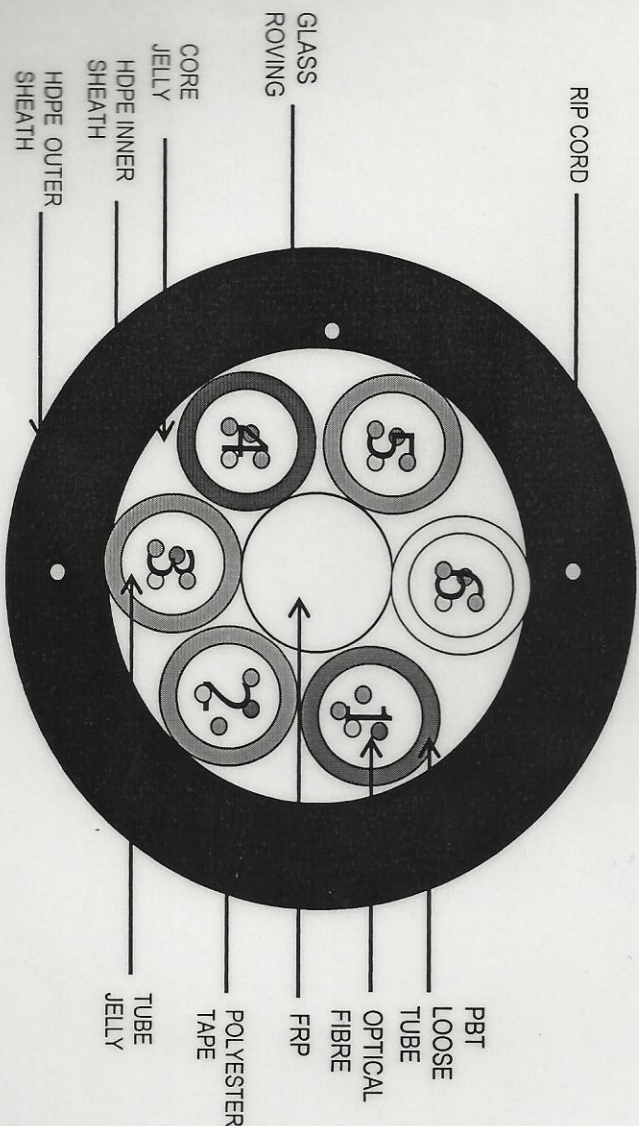

SUB-DIVISIONAL ENGINEER (TSA)
O/o CGM, TQAC, Bangalore-41

KEC

KEC INTERNATIONAL LIMITED

24F SM METAL FREE OPTICAL FIBRE CABLE: TYPE 1

[Non-Nylon type]



CROSS SECTIONAL DRAWING

Specification : As per BSNL Corporate office tender no.

CA/CNP/OFC/T-406/2011-12 issued on 30.08.2011

S.No.	COMPONENTS	DIMENSION / DESCRIPTION
1	FRP ROD, EVA COATED	CENTRAL STRENGTH MEMBER DIAMETER : 2.0 ± 0.1/0.0 mm
2	SM (G652D) OPTICAL FIBRES COLOUR	BLUE, ORANGE, GREEN AND NATURAL Cabled fibre Attenuation : ≤ 0.36 dB/km at 1310 nm, ≤ 0.23 dB/km at 1550 nm & ≤ 0.26 dB/km at 1625 nm.
3	LOOSE TUBE - 6 Nos., 4 FIBRES IN EACH TUBE	PBT TUBE OD : 1.9 ± 0.1 mm, TUBE ID : 1.2 mm Min.
4	TUBE COLOUR	1. BLUE, 2. ORANGE, 3. GREEN, BROWN, 5. SLATE & 6. WHITE
5	TUBE JELLY	LOOSE TUBE IS FILLED WITH THIXOTROPIC JELLY
6	CORE JELLY	CABLE CORE IS FLOODED WITH WATER BLOCKING JELLY
7	POLYESTER TAPE	WRAPPED OVER THE CABLE CORE
8	HDPE (UV) BLACK INNER SHEATH	MINIMUM THICKNESS 1.2 mm
9	Impregnated Non water Blocking Flexible GLASS ROVING	Mn. 20 Kg. APPLIED HELICALLY OVER INNER SHEATH
10	3 Ply RIP CORD - 3 Nos.	2 Nos. UNDER THE OUTER SHEATH, DIAMETRICALLY OPPOSITE EACH OTHER AND 1 No. UNDER INNER SHEATH
11	HDPE (UV) BLACK OUTER SHEATH with anti termite and anti rodent additive	MINIMUM THICKNESS 1.6 mm
12	OVERALL DIAMETER OF THE CABLE	13.2 mm ± 1.0 mm
13	OVERALL WEIGHT OF THE CABLE	150 kg/km NOMINAL

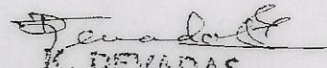
K. DEVAIAH
Sub Divisional Engineer (QA)
Telecom QA Circle, BSNL
Pondicherry-605 009
Camp at : MYSORE

SC/TECHNICAL DIVISION

ANNEXURE - BTSEC NO.: TSEC/BG/OFc/040 MAY 2012Dated : 11.05.2012

The details of the Component parts (Source, Material, Dimensions and quantity) are as below.

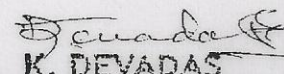
Sr. No.	Component Parts	Quantity/Source	Recommended Value	Measured Value	Remarks
1	Type of Single mode Optical Fibre	Single Mode matched clad optical fibre (G 652 D) of M/s Birla Furukuwa Fibre Optics Ltd., Goa.	Attenuation	Attenuation	OK
			1310 nm : ≤ 0.36 dB/Km	Max: 0.330 dB/Km Min: 0.300 dB/Km	
			1550 nm : ≤ 0.23 dB/Km	Max: 0.205 dB/Km Min: 0.179 dB/Km	
			1625 nm : ≤ 0.26 dB/Km	Max: 0.220 dB/Km Min: 0.180 dB/Km	
2	Refractive index of the fibre	-	To be Indicated by Manufacturer	1.4670 at 1310 nm	OK
				1.4680 at 1550 nm	
				1.4690 at 1625 nm	
3	Number of Fibres in Cable	-	24	24	OK
4	Number of Fibres in Tube	-	Four Fibres per Tube	Four Fibres per Tube	OK
5	Fibre Colour Coding used in each Tube	-	Blue, Orange, Green & Natural	Blue, Orange, Green & Natural	OK
6	Number of Loose tubes used	-	Six Loose Tubes	Six Loose Tubes	OK
7	Colour Coding of the Loose Tubes	-	Blue, Orange, Green, Brown, Slate & White	Blue, Orange, Green, Brown, Slate & White	OK
8	Material of the Loose Tubes	PBTP of M/s Ester Industries Ltd., Khatima. Grade: ESTOPLAST EP 1115	PBTP	PBTP	OK
9	Diameter of the Loose Tube	-	1.9 ± 0.1 mm	Max: 1.98 mm Min: 1.92 mm	OK
10	Number of Dummies Used & Colour	-	Nil	Nil	OK
11	Polyester tape	M/s. Aavees Laminations, New Delhi	Width 25 mm (nominal) Thickness : 24 Microns min.	Width :25.0 mm Thickness: 36 microns	OK
12	Type & number of Binder Thread used	M/s MSS Industries, Pune	-	Three	OK
13	Type & No. of Strength member(s) and their position	M/s Indore Composite Pvt. Ltd., Dhar,M.P., India	1 No.	One Solid FRP rod is used in the center of the core.	OK


K. DEVADAS
 Sub Divisional Engineer(CA)
 Telecom QA Circle, BSNL
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The details of the Component parts (Source, Material, Dimensions and quantity) are as below.

Sr. No.	Component Parts	Quantity/Source	Recommended Value	Measured Value	Remarks
14	Size of Strength member(s)	-	2.0 + 0.1/-0.0 mm	Max : 2.08 mm Min : 2.03 mm	OK
15	Qty of Impregnated Glass roving	M/s Indore Composite Pvt. Ltd., Dhar, M.P., India	20 Kgs	Min: 22 Kgs	OK
16	Type & number of Rip Cords	M/s Indore Composite Pvt. Ltd., Dhar, M.P., India	Two Nos of properly waxed 3 ply & twisted Rip cords are below the outer sheath & One Rip cord below the inner sheath	Two Nos of properly waxed 3 ply & twisted Rip cords are below the outer sheath & One Rip cord below the inner sheath	OK
17	Type of Inner Sheath, Material/Colour/Grade	BORSTAR HE 6060 of M/s Borouge, Abu Dhabi	HDPE of Black Colour	HDPE of Black Colour is used	OK
18	Thickness of Inner Sheath	-	1.2 mm (Minimum)	1.30 mm	OK
19	Outer Sheath/Jacket Material/Colour/Grade	HDP - 333 (UV) AT & AR M/s Sankala Polymers Pvt. Ltd., Naroli.	HDPE of Black Colour	HDPE of Black Colour is used	OK
20	Thickness of Outer Sheath	-	1.6 mm (Minimum)	1.9 mm	OK
21	Details of Tube Filling Compound	M/s Itco Industries Ltd., Hosur Grade: ITCOGEL T 250	Thixotropic Secondary filling compound is to be used.	Thixotropic Secondary filling compound is used	OK
22	Details of Cable Flooding Compound	M/s Itco Industries Ltd., Hosur Grade: ITCOGEL C 480	Thixotropic & Homogenous Flooding Compound is to be used.	Thixotropic & Homogenous Flooding Compound is used.	OK
23	Type of Marking on cable and the colour of the marking	-	Hot Foil Method & White in colour	Hot Foil Method & White in colour	OK
24	Moisture barrier	Filling / Flooding Compound	Filling / Flooding Compound	Filling / Flooding Compound	OK
25	Cable Diameter in mm	-	13.2 +/- 1.0 mm	Max: 14.0 mm Min: 13.3 mm	OK
26	Cable Weight in Kg/Km(Nominal)	-	140 Kg. Nom.	155.2 to 159.5 Kg/Km	OK



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