



BHARAT SANCHAR NIGAM LIMITED

(A GOVT. OF INDIA ENTERPRISE)
TELECOM QUALITY ASSURANCE CIRCLE
II Floor, Sanchar Complex, WMS Compound
Jayanagar 5th Block, 9th Main, 47th Cross, Bangalore-560041

TECHNICAL SPECIFICATION EVALUATION CERTIFICATE

No. TSEC/BG/OFC/244.FEB 2014

Date: 20.02.2014

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 ANNEXED LETTER

PRODUCT : 24F Metal free Optical Fibre Cable
With double HDPE Sheath (G.652D)

MODEL No: 7117

SPECIFICATION NO.: Section -IV-C- Technical Specifications of
BBNL Tender No. BBNL/MM/2013/001
Issued on 03.04.2013

SOFTWARE VERSION ,
(IF ANY) : NIL

ISSUED ON: 20.02.2014

VALID: Only for BBNL Tender No.
BBNL/MM/2013/001 issued on 03.04.2013

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

REMARKS: 1. Use of impregnated glass fibre reinforcement approved against TEC GR No.
TEC/GR/TX/ORM- 01/04 SEP- 09 with amendment No.1 dated 28.03.2013 and Errata No.2 dated
30.05.2013 should be verified/confirmed during BPC.
2. Cross section construction as per Annexure A and details of raw material used as per
Annexure B



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


No. TSEC/BG/OFC/244.FEB 2014

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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.Cables 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).

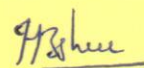
II. Infrastructure Assessment No. CGMQA/TSEC/BG/IA/12-13/068 dated 04.03.2013


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

TO:

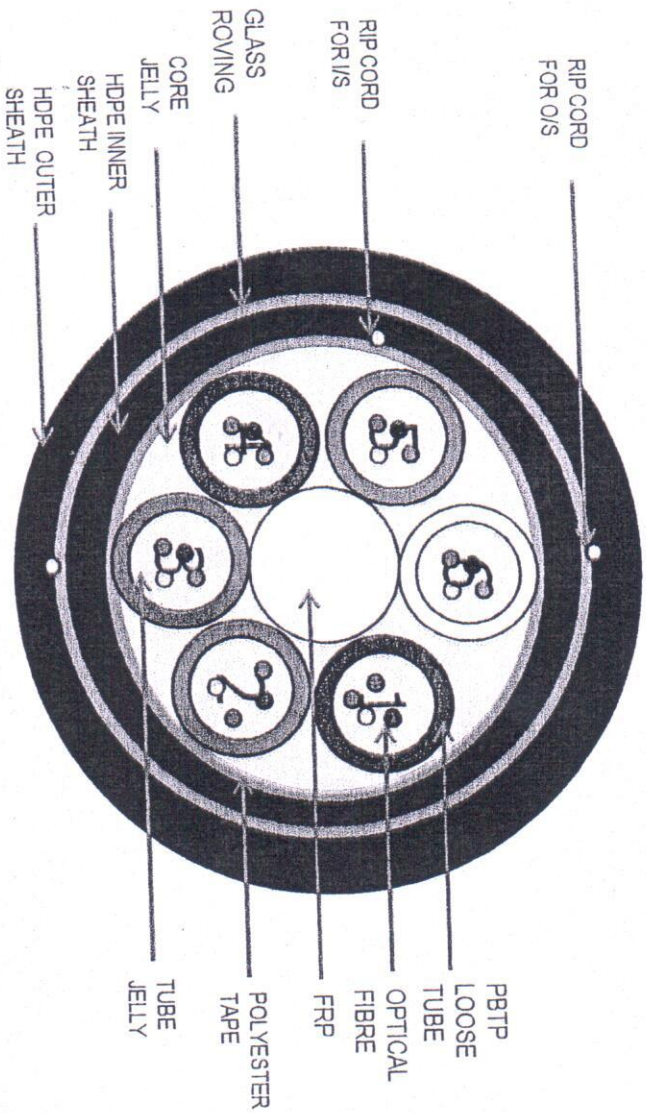
1. Sr.DDG, TEC, K.L.Bhavan, Janpath, New Delhi.
2. CGM, T & D Circle, BSNL, Jabalpur.
3. Sr.GM (MM)/ Sr.GM (CN), BSNL, Bharat Sanchar Bhavan, Harishchandra Mathur Lane, Janpath, New Delhi-01
4. Sr.GM (QA), Bangalore
5. GM(MM), BSNL Corporate Office, 3rd Floor, CDOT Campus, Mandigaon road, Chattarpur, New Delhi-110030
6. GM (NWP-CDMA WiMAX), BSNL, Bharat Sanchar Bhavan, Harishchandra Mathur Lane, Janpath, New Delhi-01
7. Addl.GM (QA), Bangalore
8. Applicant: **M/s. KEC International Limited,
349 & 350, Hebbal Industrial Area,
Hootagalli, Belavadi Post,
Mysore-570 018.**
9. 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, WET CORE**[Non-Nylon type], Model No. 7117****CROSS SECTIONAL DRAWING****Specification : As per BBNL tender no. BBNL/MM/2013/001****issued on 03.04.2013**

S.No.	COMPONENTS	DIMENSION / DESCRIPTION
1	FRP ROD, EAA 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, ≤ 0.26 dB/km at 1490 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, 4. BROWN, 5. SLATE & 6. WHITE.
5	TUBE JELLY	LOOSE TUBE IS FILLED WITH THIXOTROPIC JELLY
6	CORE JELLY	CABLE CORE IS FLOODED WITH THIXOTROPIC JELLY
7	POLYESTER TAPE	WRAPPED OVER THE CABLE CORE
8	HDPE/UV BLACK INNER SHEATH	MINIMUM THICKNESS 1.2 mm
9	Impregnated Non water Swellable Flexible GLASS ROVING	Min. 20 Kg. APPLIED HELICALLY OVER INNER SHEATH
10	3 Ply RIP CORD - 1 No.	1 No. UNDER INNER SHEATH
11	3 Ply RIP CORD - 2 Nos.	2 Nos. UNDER THE OUTER SHEATH, DIAMETRICALLY OPPOSITE EACH OTHER
12	HDPE/UV BLACK OUTER SHEATH with anti termite additive	MINIMUM THICKNESS 1.6 mm
13	OVERALL DIAMETER OF THE CABLE	13.2 mm ± 1.0 mm
14	OVERALL WEIGHT OF THE CABLE	140 Kg/km NOMINAL WEIGHT OF THE CABLE

SCHEMATIC DIAGRAM (QA), BSNL

C/O ADD. GM (QA), BSNL,
Bangalore-560 016
Camp at: Mysore


ANNEXURE - B

TSEC No: TSEC/BG/OFC/244 FEB 2014

Date: 20.02.2014

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

Sl. 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 Furukawa Fibre Optics Ltd., Goa.	Attenuation	Attenuation	OK
			1310 nm : ≤ 0.36 dB/Km	Max: 0.344 dB/Km Min: 0.291 dB/Km	
			1490 nm : ≤ 0.26 dB/Km	Max: 0.216 dB/Km Min: 0.174 dB/Km	
			1550 nm : ≤ 0.23 dB/Km	Max: 0.210 dB/Km Min: 0.170 dB/Km	
			1625 nm : ≤ 0.26 dB/Km	Max: 0.231 dB/Km Min: 0.185 dB/Km	
2	Refractive index of the fibre		To be Indicated by Manufacturer	1.4670 at 1310 nm	OK
				1.4680 at 1490 nm	
				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: 1.92 mm Min: 1.87 mm	OK
10	Number of Dummies Used & Colour	-	Nil	Nil	OK
11	Polyester tape	M/s. Rainbow Plastics India Ltd, Silvassa	Width 22 mm (nominal) Thickness : 25 Microns nom.	Width 22 mm (nominal) Thickness : 25 Microns nom.	OK
12	Type & number of Binder Thread used	Sri Venkateshwara Polythene, Ringanwada, Nani, Daman-	-	Polyester, three Nos	OK


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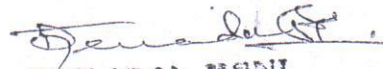
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TSEC NO: TSEC/BG/OFC/244-FEB 2014

Date: 20.02.2014

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

Sl. No.	Component Parts	Quantity/Source	Recommended Value	Measured Value	Remarks
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
14	Size of Strength member(s)	-	2.0 + 0.1/-0.0 mm	Max : 2.08 mm Min : 2.05 mm	OK
15	Qty of Impregnated Glass roving	M/s Indore Composite Pvt. Ltd., Dhar, M.P., India	20 Kgs	Max: 20.16 Kgs Min: 20.22 Kgs	OK
16	Type & number of Rip Cords	Sri Venkateshwara Polythene, Ringanwada, Nani, Daman-	Two Nos of properly waxed 3 ply & twisted Rip cords are below the outer sheath & One 3 Ply Rip cord below the inner sheath	Two Nos of properly waxed 3 ply & twisted Rip cords are below the outer sheath & One 3 Ply Rip cord below the inner	OK
17	Type of Inner Sheath, Material/Colour/Grade	BORSTAR HE 6062 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)	Min 1.24mm	OK
19	Outer Sheath/Jacket Material/Colour/Grade	HDP Black Sheathing / Jacketing Compound (for OF Cables) UV Stabilized, Grade BLS- 8888 OFC of M/s BLSPolymers Ltd. GOA	HDPE of Black Colour	HDPE of Black Colour is used	OK
20	Thickness of Outer Sheath	-	1.6 mm (Minimum)	Min 1.68 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	-	Indented and contrast colour	Hot Foil Method & White colour on Black sheath	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: 13.8 mm Min: 13.4 mm	OK
26	Cable Weight in Kg/Km(Nominal)	-	140 Kg. Nom.	140.42 to 146.57 Kg/Km	OK


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