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**DRAFT SPECIFICATION FOR
FIBRE DISTRIBUTION MANAGEMENT SYSTEM**

SPECIFICATION NO. RDSO/SPN/TC/37/2020

Revision 4. 0

Number of Pages : 13

**TELECOM DIRECTORATE
RESEARCH DESIGNS & STANDARDS ORGANISATION
LUCKNOW-226011**

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DOCUMENT DATA SHEET		
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Title of Document RDSO Specification for FIBRE DISTRIBUTION MANAGEMENT SYSTEM		
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Approved by Executive Director/Telecom/ RDSO		
Abstract		
This document specifies technical specification of: DRAFT SPECIFICATION FOR FIBRE DISTRIBUTION MANAGEMENT SYSTEM		

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DOCUMENT CONTROL SHEET

NAME	ORGANIZATION	FUNCTION	LEVEL
Director/ Telecom-I	RDSO	Member	Prepare
Executive Director/ Telecom	RDSO	-----	Approved

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REVISIONS / AMENDMENTS:

S.No.	Date of Revisions /amendment	Page No.	Revisi on	Reason for amendment
1.	NIL	Not applicable	0	First issue
2.	27-02-2003	All pages	1.0	Based on comments from manufacturers and Railways.
3.	23-09-2003	5,7	2.0	Based on internal review
4.	02-01-2004	6	3.0	Unit of water absorption not mentioned.
5.	07-01-2009	6	Amen dment-1.0	Fibre organizer shall be non-metallic made of ABS material properties.
6.	15-11-2016	9	Amen dment-2.0	New clause add ISO document - guidelines
7.	18-06 - 2020	All pages	4.0	Revision of optical fibre cable specification & As per Railway Board Letter No. 210/Tele/9(1)/1 Pt.-I dated 31.12.2019.

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I SUMMARY :-

This specification covers the requirement of Fibre Distribution Management System (OFC Termination Box and patching shelf) suitable for mounting on a 19” rack.

II . SOURCE

Draft specification RDSO/ SPN/ TC/ 037-2000 has been prepared by RDSO/ Lucknow as part of DIC No. TC/ DIC/ OFC/ Access/ 020/ 2000.

III FOREWORD

Research Designs and Standards Organisation (RDSO) is an attached office of Ministry of Railways, engaged in design and standardization of equipment for use on Indian Railways.

RDSO/ SPN specification is issued as draft specification for discussion. This specification is circulated to customers/ Railways and field inspection units for comments.

RDSO/ SPN along with comments received from various quarters is discussed in Telecom Standards Committee Meeting (TCSC). Recommendation made by TCSC is put up to Railway Board for approval. After approval from Railway Board, the specification is given an IRS number and issued as Indian Railway Standard Specification.

In the absence of IRS specification, procurement may be made as per RDSO/ SPN/ TC/ 37/ 2020 Rev.4.0 specification.

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1.0 SCOPE :

This specification covers the requirement of Fibre Distribution Management System for optical fibre cable which is suitable for mounting on a 19" rack.

2.0 REFERENCE

In preparing this standard assistance has been derived from the following.

Generic requirement GR No G /FDM-01/02 April-2007 of TEC.

3.0 GENERAL REQUIREMENT :

- 3.1 This (FDMS) shall be manufactured as per the latest technology. It shall provide management of 24/48 numbers of fibres of armoured optical fibre cable. It shall also provide facilities for reconfiguration and testing.
- 3.2 This (FDMS) shall be of compact design, easy in handling and its constructed structure shall be inherently robust and rigid for all conditions of operation, replacement, storage and transport. It should be made of fire retarding material.
- 3.3 The FDMS should be suitable for all kind of cable construction with proper arrangements for holding the sheath, FRP, loose tubes etc.
- 3.4 The system shall be modular in design and shall be easily expandable.
- 3.5 Painting and plating shall be of good quality with the thickness not less than 50 microns.
- 3.6 This (FDMS) shall be accessible for operation, testing easy handling from the front side.
- 3.7 Bend radius of Pig tails, patch cords and optical fibres in installed condition should be better than 70 mm dia.
- 3.8 Any special tool if required for installation or operation of this (FDMS) shall be provided.

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3.9 Capacity :-

- (a) Line side shall have maximum capacity to terminate 2 nos. optical fibre cable each of < 20 mm nominal dia. Each Splice tray shall have capacity to hold at least Twelve Splices and each FDMS should have capacity to hold up to Four such splice Trays and thus making the maximum capacity of FDMS to 48 Fibres..
- (b) Accordingly, the Equipment side shall have maximum capacity to take out and terminate 48 pig tails/patch cords.

4.0 CONSTRUCTION & FUNCTIONAL REQUIREMENT :

- 4.1 Typical layout of FDMS suitable for 19" rack shall as per fig.1
- 4.2 The FDMS modules are sheet metal boxes suitable for mounting on a standard 19" rack.
- 4.3 The box is a metal chassis with pull out drawers type of splicing and patching shelves mounted on telescopic slides.
- 4.4 Each splicing shelf can accommodate max. 4 nos. of cassettes/ splice trays each capable to house minimum .12 nos. of fusion type spliced joints. The loose tubes coming into splicing shelves are stored in the storage space provided before entering into the cassettes.
- 4.5 Each Patching shelf can house max. 48 nos. of specified adaptors mounted on a adaptor fixing plate. The pigtails and patch cords are connected to these adaptors. The recording sheet provided in the label holder can store the routing information.
- 4.6 These shelves are able to slide in the front direction only
- 4.7 The FDMS shall have sufficient storage space for storing extra length of loose tubes and patch cords which shall not experience the bend below critical bend radius of 35mm
- 4.8 Identification mechanism of incoming & outgoing cables / loose tubes / pigtails / patch cords fibres and connector adopter shall be provided.
- 4.9 Type of organizer / cassette

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4.9.1 Fibre organizer shall be non-metallic made of ABS material with following properties.

S.No.	Parameter	Specified Values	Test Method	Raw material/finished product Test
(a)	Specific gravity	1.01-1.21gm/cc	ASTM-D-792	To be tested on finished product.
(b)	Vicat Softening Point	100-108 °c	ASTM-D-1525	----do---
(c)	Tensile strength	2.79 kg/mm ² – 5.58 kg/mm ²	ASTM-D-638	To be tested on raw material
(d)	Elongation	≤ 50%	ASTM-D-638	----do---
(e)	Water absorption	≤0.4%	ASTM-D-57-59	----do---
(f)	Rockwell hardness	R81-R111	ASTM-D-785A	----do---

Note: A certificate from recognized laboratory is acceptable . if the manufacturer do not have the test facility.

4.9.2 Splice trays shall allow for coiling of fibres with primary (0.250 mm) and secondary (0.9 mm) coating. Following type of splices shall be accommodated in each tray:

- a) Splicing of primary coated fibres (0.250 mm)
- b) Splicing of secondary –coated fibres (0.9 mm) to primary coated fibres (0.250 mm).
- c) Splicing of secondary coated fibres (0.9 mm) to secondary coated fibres (0.9 mm)

4.10 Dimensions

Height = 180 mm ± 10 mm

Width = 450 mm (max.)

Length or depth = 275 mm ± 10 mm

Thickness of the sheet : 1.6 mm ± 0.20 mm (IS 1852 – 1885)

Should be suitable for mounting on standard 19” Instrument rack as per IS:9606/IEC 297

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4.10.1 Suitable mounting holes along with nut bolt & locking arrangement shall be provided for mounting on a standard 19" rack.(IS 9606:1980/ IEC:297)

4.10.2 The adopter mounting plate should be designed to accept either of the following type of Optical connectors.
SC/APC, SC/UPC, FC/PC,LC/APC, EURO 2000 or as per requirement. The inside sleeves of connector should be zirconia type.

4.11 Clamping arrangement for strength member shall be of stainless steel material.

4.12 Type of connector adaptor must be SC/APC unless otherwise specified . The optical coupling loss must be < 0.5 dB.

5.0 QUALITY MANAGEMENT :

5.1 It shall be manufactured as per International Quality Standards and manufacturer shall be duly accredited for ISO 9000 series of standards.

6.0 MARKING :

The marking on the system shall carry the following minimum information on the front panel of the system.

- a) Manufacture's name , date & year of production.
- b) Model no.
- c) Type of system.
- d) Capacity for number of fibres.
- e) Identification details / cable/ fibre / labeling facility.

7.1 Following items are required for each Fibre Distribution Management system

	Item to be provided by Supplier	specified by Purchaser.
1.	Connectors / adaptors (24 fibre OFC or 48 fibre OFC)	Type of connectors
2.	Patch cords – 2 No. Pig tails-2 No.	24 fibre OFC or 48 fibre OFC)

3.	Protection sleeves (30 nos for 24 fibre & 60 nos for 48 fibre)	
4.	Iso Propyl Alcohol 100 ml for 24 fibre FDMS 200 ml for 48 fibre FDMS	
5.	Cable ties, 3 dozen	
6.	1 meter scale, 1 No.	
7.	Adhesive pads	
8.	Numbering Ferrules	
9.	Cotton Buds	
10.	Velcro strap 2 nos	

8.0 TYPE TESTS:

Two samples shall be manufactured for type tests.

8.1 All the tests as mentioned in clause 3, 4, 5, 6, and 7.

8.1.1 Fibre organizer non-metallic made of ABS material (clause 4.9) shall be carried out on one sample.

9.0 ACCEPTANCE TESTS

Tests conforming to clauses 3, 4 (excluding 4.9), 5, 6, 7 with 10% sampling shall be undertaken.

9.1 Any other test shall Be carried out as considered necessary by inspecting authority.

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10.0 Routine Test:

10.1 Routine test shall be conducted by manufacturer on all FDMS

10.2 Routine test shall be conducted as per clause No. 3, 4, 5, 6 and 7. For clause 4.9.1 Firm shall maintain raw material test report for the particular lot from which the sample has been offered. Proper record should be maintained, how many fibre organizer non-metallic made of ABS material.

11.0 All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-8.1-11 latest version (titled "Vendor-Changes in approved status") and subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor/vendors in the contracts floated by Railways to maintain quality of products supplied to Railways

