



सत्यमेव जयते

रेल मंत्रालय

**Government of India
Ministry of Railways**

अनुसंधान अभिकल्प एवं मानक संगठन
रेल मंत्रालय

**RESEARCH DESIGN AND STANDARDS ORGANISATION
MINISTRY OF RAILWAYS**

कबिल प्रबन्धन के लिए कन्ड्यूट प्रणाली के लिये तकनीकी आवश्यकताओं की अनुसूची
**SCHEDULE OF TECHNICAL REQUIREMENTS FOR CONDUIT SYSTEM
FOR CABLE MANAGEMENT**

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S. No.	Details of Amendment	Revision	Page Number	Reasons for amendment
1.	July 2020	1	7	i. Rly Board Letter no-97/Elect (TRS)/113/4, dt-05.06.2020. ii. Reviewed the testing facility & machineries based on experience.

अनुमोदित
Approved

कार्यकारी निदेशक / पी. एस. एण्ड ई.एम.यू.
ED (PS&EMU)

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Table of Contents

1	FOREWORD:	3
2	PLANT AND MACHINERIES	3
3	TESTING FACILITIES	4
4	TESTS FROM NABL ACCREDITED LABORATORY	4
5	FORMAT FOR QUALITY ASSURANCE PLAN.....	4
6	SERVICE REQUIREMENT	5
7	DISTRIBUTION:.....	6

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SCHEDULE OF TECHNICAL REQUIREMENT FOR CONDUIT SYSTEM FOR CABLE MANAGEMENT

1.0 FOREWORD:

- 1.1 This schedule of technical requirements (STR) specifies minimum essential machinery, plant & testing instruments required to manufacture flexible / rigid polyamide conduits and its accessories.
- 1.2 The firm should satisfy himself about having complied with the technical requirements of the specification and other infrastructures, testing facilities and eligibility criteria requirements as per STR before applying for registration as RDSO vendor.
- 1.3 The firm should have currently valid ISO-9001 certification including the subject item under its range of manufacture.
- 1.4 The firm is advised to regularly visit RDSO web **site** and get **them selves** updated on change being made from time to time in STR/specification.
- 1.5 **In case of any contradiction between the provision of IS/IEC/EN/DIN and STR the later shall prevail.**
- 1.6 Manufacturers may apply for vendor registration online for development of polyamide flexible/rigid conduit & **associated** fittings or polyamide rigid conduit & fittings or both as per RDSO specification. Firm will submit the compliance of machine and testing apparatus required for the manufacturing of flexible or rigid conduit, whichever is applicable.
- 1.7 It is not compulsory for any manufacturer to apply for development of all sizes of flexible/rigid conduit and **associated** fittings at a time. Manufacturer may apply for any specific size of conduit & **associated** fittings or for all sizes of conduit and fittings specified in specification. If manufacturer apply for specific size of conduit and fittings, the requirement of corrugators and moulds will be applicable for that size of conduit and fittings only. Vendor registration fee will be required on every occasion of application for any size of conduit supply.

2.0 PLANT AND MACHINERIES

S. N.	DESCRIPTION
1.	Polyamide 6 extruders and autoloader with microprocessor based temperature controller for production of flexible conduit sizes applied for vendor registration
2.	Corrugators with moulds for conduit sizes applied for vendor registration.
3.	Polyamide 6 extruder and autoloader with microprocessor based temperature controller for rigid conduit of sizes applied for vendor registration.
4.	CNC Injection moulding machine suitable for manufacturing of flexible/rigid conduit fittings.
5.	Moulds for End fittings for the sizes applied for vendor registration.
6.	Moulds for flanged connectors of sizes as per specification.
7.	Moulds for rigid spouts as per specification.
8.	Chiller of suitable size as per extruder requirement.
9.	Coilers for suitable size s .
10.	CNC thread turning machine
11.	Compressor for air supply
12.	Annealing Tank of suitable size.
13.	Tensile Testing machine.

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3.0 TESTING FACILITIES :

S. N.	DESCRIPTION	Numbers
1.	Measuring instruments like Vernier Calipers, Micrometer, Scale tape, electronic balance, stop watch, pressure gauges etc.	1 each
2.	High voltage tester (2 KV)	1
3.	Compression test apparatus as per IEC – 61386-1	1
4.	Suspended load test apparatus as per IEC 61386-1	1
5.	Spread of fire test apparatus as per IEC-61386-1	1
6.	Di- electric strength & Insulation resistance test apparatus as per IEC 61386-1	1
7.	Hot & Cold flexing test apparatus with timer and counter as per IEC-61386-23 (applicable to flexing conduit only)	1
8.	Thermal test apparatus as per IEC-61386-1	1
9.	Heating oven of suitable size for conducting suspended and thermal test on all set of test equipment simultaneously	2
10.	Tensile test apparatus as per IEC – 61386-1	1
11.	Bending test apparatus (applicable to rigid conduit only)	1
12.	Collapse test apparatus (applicable to rigid conduit only)	1
13.	Conditioning chamber for conditioning of conduit and fittings at a temperature of (23±2)°C and a relative humidity between 40% and 60%	1

4.0 TESTS FROM ACCREDITED LABORATORY

- 4.1 Test results of Ingress protection test on conduit and fitting as per IEC61386-1 & IEC-60529 will be accepted from any NABL accredited or Govt laboratory for evaluation.
- 4.2 Samples of conduit and fittings sealed by RDSO representative and manufacturer jointly will be sent to NABL accredited or Govt laboratory by manufacturer on its own expenditure with instruction that lab shall sent the results of the IP tests directly to Director, PS&EMU Dte., RDSO, Lucknow-226011 directly for examination.
- 4.3 Test results of raw material as per RDSO specification will be accepted from any NABL accredited or Govt laboratory for evaluation. Samples of conduit and fittings sealed by RDSO representative and manufacturer jointly (two sets of approximately 5kg) will be sent to NABL accredited laboratory by manufacturer on its own expenditure with instruction that NABL accredited lab shall sent the results of the raw material test directly to Director, PS&EMU Dte., RDSO, Lucknow-226011 directly for examination. Necessary IR Spectroscopy finger print of raw material shall also be submitted to RDSO.

5.0 FORMAT FOR QUALITY ASSURANCE PLAN

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5.1 R&D Organization:

The firm shall indicate the organizational structure of their R&D wing along with qualification of the personnel. Firm should have at least one Engineering Graduate with experience of more than 5 years in the field of Polymer/Plastic/Chemical Engineering.

5.2 Laboratory:

The manufacture shall have a well-equipped Laboratory to carry out various tests on the **flexible/rigid conduit and fittings**, stage inspection and inspection of the finished product.

Manufacturers shall elaborate the procedure being followed for ensuring traceability of critical components used, in house test performed on each critical components, sub assembly & completed equipments individually.

5.3 Handling/Storage/Delivery:

The manufacturer shall maintain all necessary documents and data that will help him to have consistency in producing quality product.

5.4 Documentation:

The manufacturer shall maintain all necessary documents and data that will help him to have consistency in producing quality product.

5.5 Purchase of raw material:

Raw material/equipments shall be procured only from well-proven sources, conforming to relevant standards. Critical components shall be procured from reputed OEM or their accredited agents/RDSO approved source.

5.6 Quality Control-Process:

Screening of critical components shall be carried out as a part of in-process quality control. Method adopted should be clearly explained.

5.7 Inspection and testing:

Incoming Materials :

- (i) The manufacturer shall ensure that incoming material is not used for processing until it has been inspected or otherwise verified as conforming to specified requirements. Verification shall be in accordance with quality plan or laid down documented procedures.
- (ii) The supplier shall carryout all final tests and inspection in accordance with the quality plan or documented procedures evolved on the basis or Railways specification and specified standard to completed the evidence of conformances of the finished product.

5.8 Testing/Measuring Instruments:

The instruments and equipment used **for** testing and inspection shall be of the required accuracy. The calibration record should be maintained and shall be produce at the time of inspection & shall be included in QAP document/test reports.

6.0 SERVICE REQUIREMENT

6.1 Firm should have its own website through which complaint can be logged.

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- 6.2 Firm should have a working website with facility of complaint Log in. The log in field should have minimum compulsory fields. All complaints should generate a complaint number immediately to be sent on mobile/email of complainant .The information of deputing engineer against the complaint number should also be sent on same mobile/email and finally the closure report should be sent to complainant on same mobile/email.

7.0 DISTRIBUTION :

CHIEF ELECTRICAL ENGINEER:	
1.	Northern Railway, Baroda House, New Delhi – 110 001.
2.	Central Railway, II Floor, Parcel office, CST Mumbai – 400 001.
3.	Eastern Railway, Fairlie Place, Kolkata – 700 001.
4.	South Eastern Railway, Garden Reach, Kolkata – 700 043
5.	Southern Railway, Park Town, Chennai – 600 003.
6.	Western Railway, Churchgate, Mumbai – 400 020.
7.	South Central Railway, Rail Nilayam, Secunderabad – 500 371.
8.	East Central Railway, Dighi Distt- Vaishali, Hajipur Bihar- 844 101.
9.	North Central Railway, Subedarganj, Allahabad- 211 001.
10.	South Western Railway, 1st Floor, DRM Office, Hubli 580 020
11.	South East Central Railway, Bilaspur.495004
12.	North East Frontier Railway, Maligaon, Guwahati - 781001
13.	North Eastern Railway, Gorakhpur – 273001
14.	North Western Railway, Jaipur – 302006
15.	West Central Railway, Jabalpur - 482001
16.	East Coast Railway, Bhuvneshwar, Orrisa – 751016
17.	Konkan Railway, Belapur Bhavan, Sector-11, Belapur, Mumbai - 400614
18.	Metro Railway, 33 /1 J.L. Nehru road, Kolkata- 700071
19.	Integral coach factory, Perambur, Chennai - 600038
20.	Rail Coach Factory, Kapurthala (Punjab) – 144 602
CHIEF WORKS MANAGER:	
1.	Matunga Workshop, Central Railway, Mumbai 400 019.
2.	Liluah Workshop, Eastern Railway, Howrah
3.	C&W Workshop , Northern Railway, Alambagh, Lucknow-226 05
4.	C & W Workshop,N. Rly., Jagdhari – 135 002
5.	Mechanical Workshop, NER, Gorakhpur – 273 012
6.	Carraige Workshop, Southern Railway, Perambur, Ayanavaram, Chennai–600023.
7.	SCR, Lallagudda Workshop, Lallaguda, Secunderabad - 500017
8.	Carriage Workshop, Western Railway, Lower Parel, Mumbai-400013
9.	CRWS, W. C. Railway, Nishatpura, Bhopal-462010
10.	Carriage Workshop, NW Rly., Ajmer - 305001
11.	Carriage Repair Workshop, Gadag Road, SWR, Hubli – 580 020
12.	Carriage Workshop, S.W. Railway, Mysore Vishwanath.
13.	Carriage Workshop, SE Rly., Kharagpur - 721301
14.	New Bongaigaon , Railway Workshop, Dangtal, Distt. Bongaigaon, Assam-783380
15.	Carriage and Wagon Workshop, N. C. Rly., Jhansi – 248003
16.	Carriage and Wagon Workshop, WC Rly., Kota - 324002
17.	Carriage and Wagon Workshop, Eeastern Rly., Liluha - 711204
18.	Carriage and Wagon Workshop, W. Rly., Pratap Nagar, Vadodara - 390004
19.	Carriage and Wagon Workshop, N Rly., Amritsar - 143001
20.	Central Workshop, Goldenrock, S. Rly., Trichi - 620004
OTHERS:	
1.	Director, IRIEEN, Nasik Road (Maharashtra). - 422101

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2.	Senior Professor (Elect.), Railway Staff College, Lalbaug, Vadodara. - 390004
3.	Director, IRCAMTECH, Maharajpur, Gwalior – 474 020.

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