



RESEARCH DESIGNS & STANDARDS ORGANIZATION

Manaknagar, Lucknow – 226011

Document No: **TDG 0041**

Document Title : Schedule of Technical Requirements for manufacture and supply of Metal Liners for use with Elastic Rail clips

1.0 Amendment History:

S. No.	Amendment Date	Version	Reasons for Amendment
1.	10/07/2019	1.0	First issue under new documentation system for ISO 9001:2015.
2.	30/05/2022	Ver. '0'	Decontrol of item vide Railway Board's letter no. 2022/Tk-II/7/1 dated 09.02.2022 & 22.02.2022

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2.0 Purpose:

This guideline is based on Indian Railway Standard Specification for Metal Liners for use with Elastic Rail Clips T-56-2020 issued by Track Design Dte. of RDSO. The purpose is to specify technical and other requirements in context with adequate space needed for storage of raw/finished material, manpower and plant/ machinery & equipment required for manufacture and supply of metal liners.

3.0 Scope of Application

To specify Technical Requirements for manufacture & supply of Metal Liners for use with Elastic Rail Clips

4.0 Procedure / Details

Procedure/details are annexed.

5.0 Referenced Documents:

1. Indian Railway Standard Specification for Metal Liners for use with Elastic Rail Clips T-56-2020
2. ISO apex documents of RDSO

6.0 Referenced Documents of External Origin

None.

7.0 Associated Records

None.

8.0 Responsibility and Authority

Activity	Responsible	Approver	Supporting	Consulted	Informed
Creation, maintenance of this document	ED/Track-II/ Director/Track Design-IV	PED/INFRA-I	DD/AIE/ADE	M&C Dte.	All approved vendors through website
Compliance of directives contained in this document	DD/AIEADE	Director/Track Design-IV	-	-	-
Requirement of deviation from this directive	ED/Track-II/ Director/Track Design-IV	PED/INFRA-I	DD/AIE/ADE	M&C Dte.	-

9.0 Abbreviations

PED/Track Design	Principal Executive Director/INFRA-I
ED/Track-II	Executive Director/ Track Design-II
RDSO	Research Designs & Standards Organisation
ADE	Assistant Design Engineer

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A. SCHEDULE OF TECHNICAL REQUIREMENTS (STR) FOR MANUFACTURE OF METAL LINERS

The vendors seeking approval shall comply all the requirements as under:

- i) **Space:-** Covered area with adequate space for storage of finished material should be available.
- ii) **Stacking of Raw Material:-** The rolled bars to be used for manufacturing of metal liners should be stored heat wise separately so that they do not get mixed up.
- iii) **Manpower:** Sufficient experienced man power like manager, supervisor, lab. In charge, quality control persons and workmen should be available. They should possess qualification depending upon the scope of their works.
- iv) **Technical Requirements:** plant/ machinery and equipments required are listed as under:

List of plant/ machinery and equipments

S.No.	Item	No.	Capacity
	MANUFACTURING FACILITIES		
1.	Power Press	2 nos.	150-200 T
2.	Bench Grinder	1 no.	
	TESTING FACILITIES		
3.	A well lit, clean & properly ventilated physicallaboratory cum inspection room provided with easily maintainable floor & platform should be available.		
4.	Chemical Testing:		
i)	Optical emission spectrometer should be available in the laboratory for carrying out chemical analysis to determine the carbon, sulphur, phosphorous, silicon and manganese percentage in the material else the firm should possess a no objection certificate from RDSO for carrying out chemical analysis of material spectrographically from RDSO approved / accredited by Accreditation agency / Government owned spectro source as and when required by them within specified time frame. In such case, distance of spectro labfrom firms work should preferably not be more than 100 km for sake of smooth working / Inspection.	Spectrographic facility	Distance of spectro lab from firm's work should not be more than 100 KM for sake of smooth working/ inspection
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S.No.	Machines/Equipments	No.	Capacity
5.	Brinell Hardness Tester (BHN / HB) scale equipped with inbuilt camera for capturing image of indentation and capable of displaying image and measuring its size in fully automatic mode along with provision for displaying hardness as well. The system should have facility of storage of image and test results with details of sample. The salient features of Machine shall be as per Annexure –I.	1 no.	3000 kgf
6.	Standard test block within the range of 100- 200 BHN	1 no.	
7.	Vernier Callipers	1 no.	
8.	Dish or trays made of porcelain, heat resistant glass or a corrosion resistant glass or a corrosion resistant alloy of suitable size to store the hot acid for dipping the liner to check the surface defects	1 no.	
9.	Hot Plate	1 no.	
10.	Universal Testing Machine with bending facility of Class one or better (as per Clause 7 of IS 1828 part I : 2005 or latest) with facility for load rate control to facilitate operation of machine through a personal computer from a safe distance from location of machine. The machine should be calibrated from time to time by NABL Accredited laboratory. The salient features of machine shall be as per Annexure –II.	1 no.	200 KN min.
11.	Metallurgical Microscope, 100 X magnification with facility of eye piece for grain size and inclusion rating comparison	1 no.	
12.	Micro polishing Machine with Polishing reagents like Chromium Oxide or Diamond Paste	1 no.	
13.	Availability of grain size and inclusion rating charts duly enlarged.	1 no.	
14.	Charpy Impact Test Machine Annexure-III	1 no.	
	TOOL ROOM FACILITIES		
15.	i) Shaper, ii) Surface grinder iii) Nose grinder iv) Hand Saw	1 no. 1 no. 1 no. 1 no.	

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Annexure – I**Technical Specification for computerized Brinell Hardness Tester Capacity 3000Kgs****1. Description:**

Computerized Brinell Hardness Testing Machine with Load Capacity of 3000 Kgs. having camera to capture image of indentation with minimum following features –

- Indentation Image with auto date and time from system
- Identification mark of Sample under Testing
- Measurement of Hardness in Auto and Semi Auto mode along with manual measurement.
- Saved Image can be used for rechecking hardness of sample afterwards.
- PC based compatible with windows features

2. Purpose:

To take hardness of ferrous material on Brinell Scale.

3. Technical Requirement:

S.No.	Description	Units	Requirement
1.	Total loads	Kgf	3000
2.	Magnification of object	-	2X and higher
3.	Max. Test height	mm	410
4.	Scale least count	mm	.01
5.	Measurement range	mm	1-6
6.	Indentor	mm	5

4.0 Additional Facility in Software

The software system should be capable of preserving the indentation image in computer memory. The software should facilitate auto incorporation of date and time of testing from computer memory and this data should be in-editable.

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Annexure-II**SPECIFICATION OF UNIVERSAL TESTING MACHINE**

The equipment is used for Tensile, compression and bend test of materials

TECHNICAL DETAILS:

Technical Specification for Computer Controlled Servo hydraulic Universal

Testing Machine Driving method: Hydraulic System

Test Curve mode: Stress-strain Curve

Output Parameters from Computer: Yield strength, Max Load point, breaking strength, Tensile strength, deformation, elongation,

Maximum Capacity: 200 KN

Load resolution: 20 N or better

Load accuracy $\pm 1\%$ or better

Strain measuring accuracy: $\pm 1\%$ or better

Speed 2-40 mm/min

Grips for round specimen (mm) 8-30 or better

Grips for flat specimen (mm) 0-20 or better

Bending distance between rollers (mm) 50-300

Mandrel diameter for bend test 18 mm to 60 mm

Standard accessories

Grips for round specimen - 2 sets each (minimum)

Grips for flat specimen - 2 sets each (minimum)

Transverse/bending attachment – 1 set

Electronic extensometer (travel 25 mm min.) – 1 set

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Annexure-III**SPECIFICATION OF CHARPY IMPACT TEST MACHINE**

The equipment is used for Impact test of materials

TECHNICAL DETAILS:

Nominal Striking Energy: 300 + 10 J for test piece as per IS: 1757

Maximum Energy : 400 J or above

Resolution : 0.5 J or better

Display : Digital

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