



RESEARCH DESIGNS & STANDARDS ORGANIZATION

Manaknagar, Lucknow – 226011

Document No: ~~QC-G-8.1-10~~ TDG0041

Document Title : Item Specific Guidelines and Schedule of Technical Requirements for 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.	---	TDG 0041 Ver. 0	Amendment in Specification and Quality Improvement

2.0 Purpose:

This guideline is based on Indian Railway standard specification for Metal Liners for use with Elastic Rail Clips (~~Provisional~~) 2013 T-56-2020 issued by Track Design Dte. of RDSO. The purpose is to specifically define the guidelines for vendor approval of Metal Liners allotted to Quality Assurance Civil Directorate of RDSO as well as 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

This shall be applicable for initial capability assessment, ~~periodic reassessment~~ **periodic Quality audit** for extension of approval, up-gradation of vendors and maintaining their approved list. In case of any variation between the procedure/provision given in work instruction and that in the 'Item-specific guidelines', the later shall prevail. The competent authority wherever referred to in this document shall mean Executive Director, ~~Quality Assurance Civil Dte~~ Track Design Dte.

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 (~~Provisional~~) 2013 T-56-2020
2. ~~General Guidelines for vendor development~~ **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	Director/QAC ED/Track-III/ Director/Track Design-IV	ED/QAC PED/Track Design	DD/XEN/AIE/AR O/DD/AIE/ADE	Track Design Dte. & M&C Dte.	All approved vendors through website
Compliance of directives contained in this document	DD/XEN/AIE/ARO DD/AIE/ADE	Director/QAC Director/Track Design-IV	-	-	-
Requirement of deviation from this directive	Director/QAC ED/Track-III/ Director/Track Design-IV	ED/QAC PED/Track Design	DD/XEN/AIE/AR O/DD/AIE/ADE	Track Design Dte. & M&C Dte.	-

9.0 Abbreviations

QA	Quality Assurance.
QAC	Quality Assurance Civil.
PED/Track Design	Principal Executive Director/Track Design
ED/QAC ED/Track-III	Executive Director/Quality Assurance Civil Executive Director/ Track Design-III
RDSO	Research Designs & Standards Organisation
DD	Dy. Director
XEN	Executive Engineer
AIE	Assistant Inspecting Engineer.
ARO ADE	Assistant Research Officer Assistant Design Engineer

A. ITEM SPECIFIC GUIDELINES

1.0 The process of approval will involve following steps / activities.

- i) Vendor seeking fresh registration shall register online on RDSO website www.rdsolndianrailways.gov.in & <https://www.ireps.gov.in>.
- ii) Submit duly filled-in **online** fresh application form along with initial assessment charges as applicable at the time of submission.
- iii) Submit a key plan & layout plan, on Auto CAD (A-1/A-2 Size), for technical approval. The layout plan should indicate the adjacent plot productions unit thereof, roads, boundaries etc.
- iv) The specification & relevant drawings are ~~priced documents and needs to be procured by the firm from RDSO~~ available on RDSO website and same can be downloaded from RDSO website. The charges of these documents are included in fresh registration charges and no need to deposit separate charges for these documents at the first time. All payments should be made through RDSO payment portal of SBI “SB Collect” ~~or through NEFT/RTGS~~.
- v) After receipt of the filled in **application/proforma along with documents & charges**, it will be scrutinized by Quality Assurance Civil Directorate and if details are found satisfactory, the works unit of the firm will be visited for Technical Capability Assessment.
- vi) If any shortcomings are observed during the visit, the same will be conveyed to the firm for their compliance.
- vii) After satisfactory compliance by the firm, **the firm is advised to submit gauge checking charges and the inspection gauges of the drawings of metal liners applied for will be invited for check and approval by RDSO along with checking charges as applicable** checked and approved during STR verification visit.
- viii) After clearance / approval of two sets of inspection gauges as mentioned in para (vii) above, the firm would be advised to start trial production and to submit internal test results in formats as per Quality Assurance Plan (QAP) for manufacture and testing. If the internal test results are found satisfactory, the firm would be advised for drawl of samples manufactured in presence of RDSO official from their works. Charges of drawl of samples will be obtained from the firm as applicable.
- ix) The testing of the samples drawn will be carried out as per clause laid down in IRS specification for metal liners for use with ERCs (~~provisional~~) ~~2013~~ T-56-2020. If test report is found satisfactory and other conditions are fulfilled, the firm would be ~~accorded~~ **considered for approval in the category of Part-II suppliers “List of RDSO Vendors for developmental order”**. The firm will be advised to start production of the product. First 20,000 nos. of Metal Liners will be inspected by RSDO in at least two installments in two visits. During the inspection the QAP adopted and records maintained by the firm will be verified. If the inspected quantity of 20,000 nos. of Metal Liners and implementation of QAP is found satisfactory, the purchaser may be advised to get the inspection of the product done by RITES or themselves.

2.0 In the case of new Vendor/firms the process of approval will be initiated only if the firm ~~is~~ **has applied on-line or has been** placed with developmental order from Zonal Railways/ Railway Board or given go ahead from RDSO as per instructions /guidelines of Railway Board from time to time. Rest of the procedure for approval will be the same as detailed in para 1.0 above.

3.0 In case, firms approved for manufacturing of metal liner to one drawing, **applies for approval of** ~~desires to develop~~ the product to other **variant drawings of Metal Liner**, the requisite inspection gauges will have to be approved by RDSO. After getting satisfactory internal test reports, the samples **of product prototype** will be drawn and tested at RDSO. If test results on samples found satisfactory, the firm **shall be considered for inclusion in the** ~~would be accorded approval to other drawings in the list of Part II suppliers~~ **“List of RDSO Vendors for Developmental Orders”** as per the provisions of relevant ISO apex document(latest version).

~~4.0 The vendor placed in list of Part II suppliers will be considered for upgradation to the list of ‘Part I suppliers’ after fulfilling the criteria given in ‘General Guidelines for Vendor Development’, document no. QC-G-7.1-1 in force at the time of consideration of the case. The Criteria at present is as under:~~

- ~~a) The vendor has applied in writing to RDSO for Upgradation from Part II to Part I. Vendor shall apply to RDSO on Application form for Vendor Upgradation available on RDSO’s website.~~
- ~~b) The Vendor should have supplied minimum specified quantity of 2,00,000 No. of metal liner to Indian Railways, and which shall have

 - ~~i) To be in service for a minimum period of one year. Or~~
 - ~~ii) 15 months from the date of issue of last inspection certificate.~~~~
- ~~c) The registration of the firm is valid.~~
- ~~d) The vendor should possess a valid ISO 9001 certificate for his works address covering the item for which he is registered with RDSO.~~
- ~~e) Service performance No adverse performance attributable to unsatisfactory quality/ workmanship of the product has been received from the field within specified period at the time of consideration for up gradation.~~

~~4.0 Up-gradation from List of RDSO Vendors for Developmental Orders” to “List of Approved Vendors” as per procedure mentioned in RDSO’s latest relevant ISO apex document.~~

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B. 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. Incharge, 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) Inspection Gauges (Approved by RDSO) b) Inspection Gauges for internal checking	Two sets of valid and approved inspection gauges for inspection out of which one set to be retained as master gauge One set for internal checking conforming to master gauge	
4.	A well lit, clean & properly ventilated physical laboratory cum inspection room provided with easily maintainable floor & platform should be available.		
5.	Chemical Testing:		
(i)	(a) Carbon & Sulphur apparatus with suitable chemicals for analyzing C, Si, Mn, S & P elements (b) Muffle Furnace (c) Analytical Balance (d) Other apparatus for the chemical /metallurgical test lab. or Through Spectrographic facility approved by RDSO/Govt or NABL accredited laboratory for which consent letter from the lab is desired. 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 lab from 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.

S.No.	Machines/Equipments	No.	Capacity
6.	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
7.	Standard test block within the range of 100- 200 BHN	1 no.	
8.	Vernier Callipers	1 no.	
9.	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.	
10.	Hot Plate	1 no.	
11.	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.
12.	Metallurgical Microscope, 100 X magnification with facility of eye piece for grain size and inclusion rating comparison	1 no.	
13.	Micro polishing Machine with Polishing reagents like Chromium Oxide or Diamond Paste	1 no.	
14.	Availability of grain size and inclusion rating charts duly enlarged.	1 no.	
15.	Charpy Impact Test Machine	1 no.	
	TOOL ROOM FACILITIES		
16.	i) Shaper, ii) Surface grinder iii) Nose grinder iv) Hand Saw	1 no. 1 no. 1 no. 1 no.	

QUALITY ASSURANCE CIVIL TRACK DESIGN DIRECTORATE

RESEARCH DESIGNS & STANDARDS ORGANIZATION
LUCKNOW

C. **PROFORMA FOR TECHNICAL CAPABILITY ASSESSMENT/ REASSESSMENT
QUALITY AUDIT FORMANUFACTURE AND SUPPLY OF METAL LINERS FOR
ERC ASSEMBLY**

Metal Liners to Drawing No. -----

NOTE:

- (i) To be filled in by the firm in duplicate. Attach extra sheet wherever necessary. No para to be left blank.
- (ii) All manufacturing and testing facilities to be available in the unit.
- (iii) All enclosures to be signed by the authorized official of the firm.

GENERAL INFORMATION

1. Section - I :

1.1 Name of the firm -----

1.2 Address:

a) Head office: -----

b) Works: -----

c) Distance of Works in Km from the
Nearest Railway station. : -----

d) Nearest Railway Station. : -----

1.3 Factory Area (in Sq.m.)

a) Covered: -----

b) Uncovered: -----

c) Is the factory site in your name or on rental basis?:
(Support with documents). -----

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- 1.4 (a) Telephone Numbers:
- (i) Head office: -----
 - (ii) Works' premises. : -----
- (b) Telegraphic / Telex address / Fax Nos.:
- (i) Head office: -----
 - (ii) Works' premises: -----
 - (iii) E-mail Address: -----

1.5 Power Availability: (KVA)

- a) General allotted capacity: -----
- b) Stand-by generator & its capacity (if available): -----
- c) Name the part / person in whose name the power is: -----
Sanctioned and your agreement with the party/person
(Support with reasonable documents)

1.6 Name of any other units located in the above premises : -----

1.7 Man-power management:

- a) Managerial Staff : -----
 - b) Shop Floor Engineers / Supervisors. : -----
(Their number, names, qualification & service experience)
 - c) Laboratory in-charge whether full or part time : -----
(Indicate his / her name, qualifications & service experience)
 - d) Inspection & quality control staff : -----
(Give their names, qualification & service experience).
 - e) Workmen:
 - i) Highly skilled : -----
 - (ii) Semi skilled : -----
 - (iii) Un-skilled : -----

TECHNICAL INFORMATION

2. SECTION- II

2.1 Manufacturing Facilities

- (i) Mechanical Power Presses: -----
 (2 No. Minimum) 150-200T
 (a) No. as available: -----
 (b) Make: -----
 (c) Capacity: -----
 (ii) Tool room and die making facilities : -----
 e.g. shaper, surface grinder, nose grinder,
 measuring instruments etc.
- (iii) Bench grinders (Give Nos. available) :- -----

2.2 Testing Facilities:

- i) Tensile test /Universal testing Machine
 (a) Capacity: - -----
 (b) Make: -----
 (c) In-house calibration facility: -----
 (d) Dumbell preparation: -----

ii) Bend Test Facility: -----

iii) Chemical Composition Test

- ~~(a) Carbon & Sulphur apparatus with suitable chemicals for analyzing C, Si, Mn, S & P elements~~
- ~~(b) Muffle Furnace~~
- ~~(c) Analytical Balance~~
- ~~(d) Other apparatus for the chemical/ metallurgical test lab.~~

Or

Through Spectrographic facility-
 appd. By RDSO Govt or NABL
 accredited laboratory
 (Consent letter to be attached)

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 lab from
 firms work should preferably not be more than 100km
 for sake of smooth working / inspection.

iv) Dimensional Check Facility : -----
 inspection gauges (2 sets min.)

- v) Brinell Hardness Tester on, BHN/ : -----
 HB scale with standard test blocks
 within the range of 100 – 200)
- vi) Dish or trays made of porcelain, heat/ : -----
 Corrosion resistant glass or a
 corrosionresistant alloy of suitable
 size to store the hot acid for dipping
 the liner to check the surface defects
- vii) Metallurgical Microscope 100 X : -----
 magnification with facility of eye piece
 for grain size and inclusion rating
- viii) Micro polishing Machine & polishing : -----
 reagentslike Chromium Oxide or
 Diamond Paste
- ix) Availability of grain size and inclusion: -----
 rating charts duly enlarged.
- x) Charpy Impact Test Machine (1 Set min) -----

2.3 Laboratory-cum inspection room

- (i) Indicate available in Yes or No. : -----
- (ii) If yes, indicate size of room : -----

2.4 Source of raw material/metal liner bar :
 (In house rolling Mill shall be preferred) :

- 2.5 Arrangement for storing raw material/: -----
 metal liner bar at a time (in tonnes)
- 2.6 Arrangement for storing finished liners -----
 and capacity to store at a time in Nos. :
- 2.7 Availability of IS: codes as per revised : -----
 Specification

EXPERIENCE

3.0 SECTION- III.

- 3.1 Indicate various types of items being -----
 manufactured in your Works and the name
 of the agency / client for whom it is being
 manufactured. :
- 3.2 Indicate important customers for the last 3 years both -----
 Govt. & Non-Govt. if any, for information furnished
 in your reply to 3.1. :

3.3 Give details (contract reference, item & quantity manufactured & supplied) of important orders executed in the past 3 years for the following.

Indicate the inspecting agency for each. :

- (i) Govt. department, Central, State & Govt. Undertaking other than Railways: -----
- (ii) Directly to the Railways. : -----
- (iii) Outside important firms. : -----

3.4 Specify current orders in hand on your firm (Contract reference, client, item, quantity under manufacture & supply). : -----

3.5 Whether you are already registered with RDSO for other P. Way items if so, name the item supported by documents. : -----

3.6 Whether you are already registered with RDSO for items other than P. Way items if so, name the item and department with which you are registered, supported with documents. : -----

3.7 Indicate annual turnover of your company : -----

4.0 DECLARATION:

- (i) We do hereby declare that the above particulars are correct and no discrepancy shall be found during actual investigation before and during execution of order on our firm.
- (ii) Any change in the plant and machinery and change of place of office and of works site shall be brought to the notice of RDSO for clearance and approval.
- (iii) We also declare that our concern has not been black-listed by Railway / Railway Board / RDSO for business with the Railways.
- (iv) We hereby undertake that all our equipments for manufacturing and testing as listed above shall be maintained in good working order at all times.
- (v) We hereby declare that the contents and the instructions of latest **"General Guidelines for Vendors Development document no. QC-G-7.1-1"** effective from..... **"ISO apex documents of RDSO** have been read and understood by us and our firm shall agree abide by all the stipulations laid therein.

Signature
Name in full of Signing Authority
Status in the Firm,

Place:
Date:

Stamp of the firm

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.

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 ±1% or better

Strain measuring accuracy: ±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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