



भारत सरकार - रेल मंत्रालय
अनुसंधान अभिकल्प और मानक संगठन

Government of India - Ministry of Railways
RESEARCH DESIGNS & STANDARDS ORGANISATION

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**GUIDELINES FOR MANUFACTURE & SUPPLY OF
NYLON CORD REINFORCED ELASTOMERIC PAD**

Price: Rs. 720/-

गुणवत्ता आश्वासन सिविल निदेशालय

अनुसंधान अभिकल्प और मानक संगठन
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(A) ITEM SPECIFIC GUIDELINES FOR NYLON CORD REINFORCED ELASTOMERIC PAD

1. The process of approval of new firms may be initiated on the request of firm provided the firm is placed with a developmental order by Railway Board / Zonal Railway or as per instructions received from Railway Board.

In case of new firms which are not approved by RDSO for manufacture and supply of Grooved Rubber Sole Plates, the works premises of the firm will be required to be visited by a team of RDSO officers.

The firms which are to be processed for placement on approved list of manufacturer will be supplied a copy of blank proforma for Technical Capability Assessment for Nylon Cord reinforced Electrometric Pad, the firm will submit the same in triplicate after filling details along with service charges. After receipt of the filled in proforma it will be scrutinized by QA Civil Dte. If any shortcomings are observed in the proforma, these will be conveyed to the firm for compliance. The infrastructure of the firm which are already approved for 6mm Thick Grooved Rubber sole plate may not be verified, however, the firm will have to confirm the installation of Calendaring Machine, H-Pull test production and testing of the product for approval of RDSO. *However, installation of calendaring machine will not be insisted for initial approval.*

2. For measurement values of Denier, number of twists and number of ends/per unit etc. the firm may submit the certificate in original given by the supplier of Nylon Cord.
3. After confirmation of installation of the facilities, the firms may be advised to submit internal test results of their product for scrutiny of this office. In case the internal test results are found satisfactory, firm will be advised for drawl of samples from their works and subsequently testing at RDSO/M&C Lab. The firm will have to pay the sample drawl and testing charges as applicable to M&C Dte.
4. The additional facilities installed, by the firm will be verified by the official at the time of drawl of samples. However, QAP will have to be approved by QA Civil Dte. After scrutiny at RDSO.
5. The samples will be tested for properties as laid down in the IRS Specification for particular nylon cord reinforced electrometric pad. In case the sample test results are found satisfactory, the firm may be accorded approval in the category of 'Part-II supplies' for a period of 24 months.

UPGRADATION FROM PART-II TO PART-I

The vendor will be considered for up-gradation on his request in writing after the following criteria are fulfilled.

- i) Completion of minimum one year in the category of Part-II.
- ii) Installation of calendaring machine in the premises of firm.
- iii) Supply of minimum quantity of 5000 no. of pads.
- iv) Implementation of RDSO approved QAP.
- v) Possessing valid ISO certification.
- vi) Approval of firm is valid for the product.
- vii) 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 (for this purpose details of the complaints received from zonal railways against the quality of items supplied by the manufacturers shall be maintained by RDSO).
- viii) Results of reassessment / quality audit which would be carried out after all the above conditions are fulfilled being found satisfactory.
- ix) Samples collected from the field/consignee end if any, pass tests at RDSO / approved test lab as per approved procedure for the respective item.

After fulfillment of all the above stipulations, the vendor will be brought in the list of 'Part-I supplies' for a period of three years (five years in case product inspection continues with RDSO)

**B) SCHEDULE OF TECHNICAL REQUIREMENTS FOR
MANUFACTURE AND SUPPLY OF NYLON CORD
REINFORCED ELASTOMERIC PAD**

1.0 SCOPE

- 1.1 The schedule of technical requirements covers the norms for manufacture and supply of Elastometric Pad.

2.0 REQUIREMENTS

The vendors seeking approval shall comply all the below mentioned requirements.

General and Manufacturing Facilities:

- 2.1 Covered area free from dampness and humidity with adequate space for storage of raw rubber, carbon and chemicals.
- 2.2 The weighing facilities for measuring various raw material constituents and the product at various stages.
- 2.3 Facilities for storage of mixed rubber compound batch-wise.
- 2.3.1 Facilities for mixing rubber compound.
- 2.3.2 Facilities for extrusion (optional)
- 2.3.3 Facilities for curing and molding the Elastomeric pad (curing hydraulic press)
- 2.3.4 An automatic thermic heating moulding press equipped with temperature controllers, digital temperature indicators and the timers. There should be a provision to set the press in such a way that the required pressure, the time period a particular product without disturbing the setting on the machine.
- 2.3.5 Minimum two nos. suitably designed discs and transfer moulds for the product.
- 2.3.6 It is to be ensured that the moulds are measured for their accuracy for various dimensions and profile at least on weekly basis or after a production of 500 pads which ever is later and the observations of the considerable time period.
- 2.3.7 It is to be ensured that the system for checking the dimensional accuracy of the mould exists in case it is being used after a gap of considerable time period.
- 2.3.8 In house availability of minimum infrastructure for maintenance and polishing of discs and moulds.
- 2.3.9 Facilities for measuring and recording temperature of surface.
- 2.4 Facility for adequate storage of finished product, batch-wise to avoid mix up (Bond room).

3.0 TESTING FACILITIES:

The Following testing facilities and measuring instruments should be available with the firm.

- 3.1 A separate laboratory, mixing with all testing facilities required for testing of the product.
 - 3.2 Tensile testing machines capable to read the load and suitable device to measure elongation as per the requirement of the product.
 - 3.3 Muffle furnace.
 - 3.4 Shore 'A' hardness tester with certified standard test block.
 - 3.5 Chemical balance and crucibles for measuring Ash Content.
 - 3.6 Sufficient number of compression set equipment with suitable steel separators.
 - 3.7 Sufficient tensioning device with suitable self tightening grip.
 - 3.8 A suitable air oven and other facilities as per requirement of test method given in the specification.
 - 3.9 Load compression testing equipment, capacity 50 with two dial gauges capable of reading 1/100mm to be mounted on the opposite sides of the equipment so as to measure the compression.
 - 3.10 Go and No Go gauges are calibrated on due date and the record there of.
 - 3.11 The follow measuring instruments in adequate number.
 - i) Dial gauges
 - ii) Vernier Calipers
 - iii) Dumbbell and test specimen cutter
 - iv) Two sets of Go, No-Go, gauge for all the important dimensions marked with firm's initial, set no. of gauge and drg. No. of the product.
 - v) Steel Scale (Linear)
 - vi) Hygrometer (Humidity Recorder) of suitable range.
 - vii) Magnifying Glass (20-50%)
 - viii) Thickness gauge with stand
 - ix) Twist counter
 - 3.12 One no. UTM / tensile testing machine of capacity 1000kg for breaking load test.
 - 3.13 Facility for polymer identification.
 - 3.14 Any other facility required for testing method given in the specification.
- 4.0 Quality Control Requirements :**
- 4.1 There should be QAP for the product detailing following aspects.
 - i) Organisational chart

- ii) Flow Process Chart
- iii) Stage inspection details

All the relevant specification and IS Standards should be available with the firm.

(C) PROFORMA FOR TECHNICAL CAPABILITY ASSESSMENT FOR MANUFACTURE AND SUPPLY OF NYLON CORD ELASTOMERIC PAD

(To be filled in by the firm in triplicate. Attach extra sheets wherever necessary)

1. SECTION-1 : GENERAL INFORMATION

- 1.1 Name of the firm
- 1.2 Address
 - (a) Head Office
 - (b) Works
 - (c) Location of works Km.
From Railway Station
- 1.3 Factory Area (Sq. m)
 - (a) Covered
 - (b) Uncovered
 - (c) Is the factory site in your name or on rental basis?
Support with documents.
 - (d) Telephone No.
 - (i) Head Office
 - (ii) Works
 - (e) Telegraphic address/Telex/Address/FAX address.
 - (iii) Head Office
 - (iv) Works
- 1.4 SSIC/NSIC Registration No. (Enclose Copy)
- 1.5 Power availability (KVA)
 - (a) General allotted capacity
 - (b) Standby generator and its capacity, if available.
 - (c) Name the party / person in whose name the power is sanctioned and your agreement with the party/person (Support with 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 Nos. with their qualifications and service experience)
 - (c) Laboratory In-charge whether full time or part time (Indicate their names, qualifications and service experience)
 - (d) Inspection & quality control staff (Give their name, qualifications and service experience)
 - (e) Workmen
 - (i) Highly skilled
 - (ii) Semi-skilled
 - (iii) Un-skilled

2. SECTION-II : TECHNICAL INFORMATION

- 2.1 Infrastructure for Production of Elastomeric Pad.
- 2.2 Facility for weighing of raw material and storage of weighed raw material batch-wise.
- 2.2.1 Facility for mixing rubber compound.
- (a) Mixing mills
 - (i) Nos.
 - (ii) Type
 - (iii) Size
 - (iv) Capacity
 - (v) Make
 - (vi) Temperature control system
 - (b) Internal mixer (optional)
- 2.2.2 Facility for keeping mixed rubber compound batch wise.
- 2.2.3 Facilities for extrusion (optional)
- (a) Extruder
 - (i) Nos.
 - (ii) Size
 - (iii) Type

- (iv) Capacity
- (v) Make
- (vi) Temperature Control system

2.2.4 Facilities for curing and moulding the Grooved Rubber Sole Plate Curing Hydraulic press.

- (i) Nos.
- (ii) Type
- (iii) Make
- (iv) Day lights
- (v) Size
- (vi) Capacity
- (vii) Clamping pressure
- (viii) Mode of heating for press (Steam/electrical)
- (ix) Temperature Control system

2.2.5 Facilities for measuring and recording temperature of :

- (a) Rubber Compound
- (b) Surface

2.2.6 Facilities for maintenance and repairs of equipment and moulds (optional)

- (a) Tool room M&P
- (b) Mould and dies.

2.2.7 Rated production capacity planned for Elastomeric Pad.

2.2.8 Arrangement for storing finished sole plates, batch-wise to avoid mix up (Bond room)

2.3 INFRASTRUCTURE FOR PROCESSING

- (a) Source of procurement
- (b) Whether the cord shall be procured in treated or untreated condition.
- (c) Facility available – 3 roll calendar / spreader (optional)
 - (i) Nos.
 - (ii) Type
 - (iii) Make
 - (iv) Size
 - (v) Capacity
 - (vi) Mode of heating for press (Steam / electrical)

2.3.1 Test facilities cum quality control measures.

2.3.2 Laboratory Room

- a) Size Mechanical lab and chemical lab.
- b) Air conditioning arrangement for Controlling temperature and humidity in the room. (Reply in Yes/No)

2.3.3 TEST FACILITIES FOR RUBBER COMPOUND

S. No.	TEST	REQUIREMENT	INDICATE AVAILABILITY IN DETAILS
(i)	Hardness (Shore A)	(a) Hardness tester Shore 'A' Durometer (b) Other test facilities as per The requirement of test method given in the specification	
(ii)	Tensile strength	(a) Tensile machine with suitable grips capacity up to 1 tonne with adjustable lower scale and capable of adjusting operating speed 450-60 mm/min. The testing machine shall be suitable for relaxed modulus testing (b) Other test facilities such as preparation of test specimens and Facilities as per the requirement of test method given in the specification	
(iii)	Elongation at break	(a) Tensile Testing Machine (b) Other test facilities as per the requirement of test method given in the specification	
(iv)	Modulus relaxed at 100% elongation	(a) Tensile Testing Machine with power actuated grips and operating speed of 450-600 mm/minute (b) Other test facilities as per the requirement of test method given in the specification	
(v)	Compression set at 50% compression	(a) Compression set equipment with suitable steel spacers (b) Air oven and other facilities as per requirement of test method given in the specification	
(vi)	Tension set at 50% stretch	(a) Tensioning device with suitable self tightening grips.	

- (b) Air oven and other facilities as per requirement of test method given in the specification
- (vii) Load compression Characteristic
 - (a) Hydraulic press, 50t capacity mounted with two dial gauges capable of reading 1/100 mm.
 - (b) Other test facilities as per the requirement of test method given in the specification
- (viii) Dimensional Check
 - Two sets of inspection gauges
- 2.3.4 Facility for accelerating ageing of the rubber pad
 - Electrical oven with provision of Air circulation and continuous temperature / time recorder
- 2.3.5 Facility for checking Calibration of the Tensile Testing machine and periodicity of Calibration
- 2.3.6 Facility for checking the Calibration of the hydraulic press for the load compression Characteristics test and the periodicity of checking Calibration
- 2.3.7 Special facilities for testing of Elastomeric Pad.
 - (a) Polymer Identification
 - (b) Ash Content
 - (c) Specific Gravity
 - (d) Breaking Load Test

2.3.5 TEST FACILITY FOR NYLON CORD

TEST	REQUIREMENT
i) Denier	Chemical Balance
ii) Ends / Inch	a) Magnifying Glass (20-50%) b) Steel Scale – 6”
iii) Thickness	Thickness gauge with stand (least count 0.001 mm)
iv) Breaking Load	UTM Capacity 100 kg special grips for textile cord testing
v) Elongation at Break	-do-
vi) No. of Twists	Twist Counter
vii) H-Pull Test	
viii) Peel Adhesion Test	

2.3.6 Staff strength

- (a) Production staff
- (b) Quality assurance staff
- (c) Staff for quality monitoring at production stage
- (d) Staff for laboratory testing.

2.3.7 Give a list of the relevant IRS, I.S. and ASTM specification as available with you relevant for grooved rubber sole plates and Nylon cord elastomeric pad.

2.2.8 Submit quality assurance programme if any being followed or proposed to be introduced covering information, audit check, points pertaining to various stages, such as raw material control, chemical weighing room mixing, performing, curing, finishing, Inspection and packing stages. Formats being used/proposed to be used for the documentation of quality control system also be submitted.

3. SECTION – III : EXPERIENCE

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.

3.1.1 Indicate important customers for the last three years both Govt. and non Govt., if any, for information furnished in your reply to 3.1

3.2 Indicate details (contract reference, item and quantity manufactured and supplied of important orders executed in the past three years for the following. Indicate the inspecting agency for each.

i) Govt. Department, Central, state and Govt. undertaking other than Railway.

ii) Directly to the Railways.

iii) Outside important firms.

3.3 Please specify current orders in hand on your firm (Contract reference, client, Item, Quantity under manufacture and supply)

3.4 Whether you are already registered with RDSO for other P.Way Items. If so, name the item supported by documents.

3.5 Whether you are already registered with RDSO for other than P. Way Items. If so, name the item & deptt. With which you are registered. Supported by documents.

3.6 Indicate annual turnover of your company.

4. DECLARATION

4.1 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.

4.2 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.

4.3 We also declare that our concern has not been black listed by Railway, Railway Board / RDSO for business with the Railways.

4.4 We hereby undertake that all our equipments for manufacturing and testing as listed above shall be maintained in good working order at all times.

Signature

Date

Place

Name in full of signing
Authority
Status in the firm

Stamp of the firm.