

REVISION OF SPECIFICATION / STR

Item Name: Schedule of Technical Requirement Manufacturers of Rubber Spring Elements to Drawing No. SK. DL- 4565.

STR No. : MP-STR- LD-01-03-11

1. RDSO is reviewing the specification/STR to cater to the latest technological developments in the field, modify clauses not relevant in the present context and making them more enabling with focus on functional requirements.
2. It is requested that your comments / suggestions with regard to improvements / modifications in specification/ STR of the above mentioned item may be submitted in the following format along with the justification for the changes required.

Part A: Basic Information

SN	Particulars	Information
1.	Name	
2.	Designation	
3.	Professional Qualification	
4.	Organization / Firm's Name	
5.	Address for correspondence	
6.	Email ID	
7.	Whether firm is registered with RDSO for the subject item. If yes, details like date of registration, current status etc. If no, firm's experience in manufacturing of subject item or similar item.	
8.	Whether any technical document/ Report/ Study to support suggested changes in available/ enclosed for better appreciation.	

Part B: Comments / suggestions on the specification

SN	Clause No. of RDSO STR/ Spec	Clause, as it exists in RDSO STR/ Spec	Clause, as it should read after incorporation of comments/ suggestions in RDSO Spec / STR	Justification for changes

Comments may be sent to following address within 15 days from the date of publication on rdso.indianrailways.gov.in

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Research Designs and Standards Organization
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GOVERNMENT OF INDIA
MINISTRY OF RAILWAYS

**Schedule of Technical Requirements
for Manufacturers of Rubber Spring
Elements to Drawing No. SK. DL- 4565
STR No. MP-STR- LD-01-03-11 (Rev. 01)**

May 2021

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Issued by

Motive Power Directorate
Research, Designs and Standards Organisation
Manak Nagar, Lucknow-226011

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FINAL DRAFT

**SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURERS
OF RUBBER SPRING ELEMENTS TO DRAWING NO. SK.DL-4565
STR NO. MP-STR-LD -01-03-11 (Rev. 01)**

1.0 SCOPE

1.1 This part covers the infrastructural requirements for manufacture of elements for rubber buffer spring for side buffers of locomotives.

2.0 REQUIREMENTS

2.1 All vendors seeking registration with RDSO shall fulfill the requirements of this Schedule.

3.0 GENERAL & MANUFACTURING FACILITIES

3.1 Covered area with adequate space for storage of raw rubber, carbon and chemicals shall be available, which shall be free from dampness and humidity.

3.2 The following weighing facilities for measuring various raw material constituents and the product at various stages shall be available.

- a) Electronic weighing balance of 2 to 5 Kg Capacity.
- b) Mechanical Spring Balance or Platform Weighing Machine of the capacity of minimum 50 Kg of reputed make.

3.2.1 It shall be ensured that the Weighing Machines are calibrated regularly as per manufacturers / IS specifications.

3.3 At least one power press of capacity 150T shall be available for punching steel plates.

3.4 At least two sets of closed dies, fixtures and templates for cutting, blanking, punching of steel plates as per the drawing requirements shall be available.

3.5 Minimum one Bench grinding machine to remove sharp edges from the sheared/blanked or bent steel plates shall be available.

3.6 At least two sets of Go & No-Go gauges shall be available to check the dimensional accuracy of the steel plates as also to check the product at intermediate stage & final stage.

3.7 Minimum one Shot Blasting Machine with table dia of at least 3 feet shall be available. The shot blasting machine shall have in-built facility of sieving to screen under size shots.

3.8 Facility for degreasing shall be available. The process of cleaning shall be a proven one and shall be capable of removing accumulated dirt/dust, black spot etc.

- 3.9 Suitable spraying facility for application of adhesive shall be available. The spraying machine shall have an in-built provision of stirring the adhesive.
- 3.10 Measuring equipment to measure the thickness of adhesive coats at primer application & final application stage shall be available.
- 3.11 A Suitable capacity close mixing mill (Banburry) is preferable. However availability of at least one kneader /internal kneader shall be essential.
- 3.12 One extruder to ensure uniform mixing shall be available.
- 3.13 Minimum one number open mixing mill for sizing of rubber sheets shall be available. The open mixing mill shall be equipped with suitable cooling arrangements and digital temperature indicator.
- 3.14 Minimum one injection moulding machine of adequate capacity along with suitable dies and moulds to manufacture high capacity buffer pack in accordance with the specification.
- 3.15 It shall 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 packs which ever is later and the observations of the mould shall be recorded.
- 3.16 In-house availability of minimum infrastructure for maintenance and polishing of dies and moulds shall be available.

4.0 TESTING FACILITIES

- 4.1 Controlled atmosphere laboratory to maintain standard temperature for rubber testing as per IS: 13867 shall be available.
- 4.2 Tensile testing machines capable of reading the load and elongation as per the requirement of the product shall be available. The tensile testing machine shall have all the provisions in accordance with para 4.2 of IS:3400 part I.
- 4.3 One testing machine with load indicator having a least count of minimum 20 Kg shall be available. The capacity of the machine shall be adequate to work the same at specified speeds and it shall be capable to apply the required load for testing of the products for various deflection parameters with in the stipulated specifications.
- 4.4 One Rheometer shall be available and must be used regularly. The record of batches which are checked on Rheometer shall be maintained.
- 4.5 Suitable Tup Hammer as per product test requirement shall be available.
- 4.6 Suitable Fatigue Test machine as per product Testing requirement shall be available.

- 4.7 Minimum two numbers air ovens shall be available to facilitate the testing in accordance with para 4.2 & 6.2 of IS:3400 Part X.
- 4.8 Minimum one number muffle furnace shall be available.
- 4.9 Minimum two numbers Shore Hardness tester with standard test pieces shall be available.
- 4.10 At least one number specific gravity testing apparatus shall be available.
- 4.11 Facility to check the viscosity of the adhesive shall be available.
- 4.12 Facilities for preparing test specimen as per IS:3400 Part I shall be available.
- 4.13 Below mentioned measuring instruments in adequate number shall be available :
 - a. Micrometer
 - b. Dial Gauges
 - c. Vernier calipers
 - d. Go-No-Go gauges for all the important dimensions for a specific product
- 4.14 Minimum one number chemical balance and a crucible for measuring ash content shall be available.
- 4.15 Compression set testing apparatus in accordance with para 4.1 of IS: 3400 Part X shall be available.
- 4.16 Minimum two sets suitable fixtures for compression load deflection test as per the drawings specified in the relevant specification of product shall be available.
- 4.17 Suitable facilities for cutting the test specimen from the product shall be available.

5.0 QUALITY CONTROL REQUIREMENTS

- 5.1 The manufacturer shall have their own valid ISO: 9000 series certification for the product for which an approval is sought.
- 5.2 There shall be a system to ensure the traceability of the product beginning with raw material stage to finish product stage.
- 5.3 There shall be a system to ensure 'first-in first-out' for all raw materials and intermediate stages to finish products.
- 5.4 It shall be ensured that there is a Quality Assurance Plan for the product detailing the following various aspects:
 - Organisation chart
 - Process flow chart

- Stage inspection details from raw materials stage to finish product stage with relevant IS.
- Various parameters to be checked and level of acceptance of such parameters indicated and method to ensure and control over them. At least 2 in 1000 pieces shall be checked.
- Disposal system of rejected raw material and components.

5.5 The quality manual of the firm for ISO: 9000 shall clearly indicate the control over manufacturing at every stage and testing of the said Railway product.

5.6 There shall be at least one graduate degree holder person in relevant technology with field experience of at least 5 years or a diploma holder with experience of 10 years on rubber technology for regular production and quality control.

5.7 It shall be ensured that proper analysis is being done on monthly basis to study the rejection at various stages of production and is documented.

5.8 Latest version of all the relevant specification IS, ASTM and RDSO standards and drawings with latest alterations shall be available with the firm.

5.9 It shall be ensured that a minimum of 2 Nos. GO and NO GO gauges are available for checking the dimensional accuracy of the products and these gauges are being calibrated at regular frequency.

6.0 DOCUMENTATION

Firm shall maintain following documents/records:

6.1 A well documented Quality Plan.

6.2 Incoming raw material register shall be checked as per approved QAP.

6.3 Stock register for use and balance of raw materials, bought out items etc.

6.4 Stage inspection results including finished products results, as per approved QAP.

6.5 Records of internal rejection and its analysis vis-a-vis action plan.

6.6 Records of final products inspection by external agencies (like RDSO), NCR and case analysis as well as action taken thereof.

6.7 Records for maintenance of dies/moulds.

6.8 Proper system for dealing with customer complaint.

7.0 TRAINING

7.1 Training needs shall be identified for all concerned officials and regular training shall be organised and imparted on maintenance of machines, quality assurance, safety parameters etc.