सत्यमेव जयते	RESEARCH DESIGNS & STANDARDS ORGANIZATION Manaknagar, Lucknow – 226011
Document No: TDG 0007	
Document Title : Schedule of Technical Requirements for manufacture and supply of Single Coil Spring Steel Washer	

1.0 Amendment History:

S. No.	Amendment Date	Version	Reasons for Amendment
1.	01.12.2001	0	First issue under new documentation system
2.	30.05.2022	1.0	Decontrol of item vide Railway Board's letter no. 2022/Tk-II/22/7/1 dated 09.02.2022 & 22.02.2022

2.0 Purpose:

This guideline is based on Indian Railway Standard Specification IRS/T-42-2020 (First Revision) for Single Coil Spring Steel Washers for use in Railway Track issued by Track Design Dte. of RDSO.

3.0 Scope of Application

This standard shall define the special technical requirement for manufacturing of single coil spring steel washer.

4.0 Procedure / Details

Procedure/details are annexed.

5.0 Referenced Documents:

1. Indian Railway Standard Specification for Single Coil Spring Steel Washer for Track S. No. T-42-2020 (First Revision)
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/XEN/AIE/ ADE/ARO	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.	-

Abbreviations

PED/Track Design	Principal Executive Director/ INFRA-I
ED/Track Design-II	Executive Director/Track Design-II
RDSO	Research Designs & Standards Organization
DD	Dy. Director
AIE	Assistant Inspecting Engineer
ADE	Assistant Design Engineer

SCHEDULE OF TECHNICAL REQUIREMENTS FOR MANUFACTURE OF SINGLE COIL SPRING STEEL WASHER

1.0 SCOPE: The schedule of technical requirements covers the norms for manufacture of Single Coil Spring Steel Washer.

2.0 REQUIREMENTS:

2.1 MANUFACTURING FACILITIES:

2.1.1 Space: Sufficient covered area with proper ventilation should be available for manufacturing & testing/inspection facilities. Storage of raw material, space of coiling machine, cutting machine, stamping machine, heating furnace for hardening, quenching tank, tempering furnace, automatic Steel Washer testing machine for preliminary loading & load testing & for storing finished products should be marked clearly.

2.1.2 Raw material: Raw Material for "Single Coil Spring Steel Washer" shall be stored in a covered area with stacking arrangement by heat wise & first come first go facility.

2.1.3 Spring Steel Washer Forming Machine: Spring Steel Washer forming/coiling machine of sufficient capacity shall be installed near the storage of rawmaterial.

2.1.4 Power Press: One power press with sufficient capacity to cut the coiled bar shall be installed near the coiling machine. Two are three supports depending upon length of coiled bar shall be provided near cutting press, to hold the coiled bar in proper position while cutting.

Power presses of sufficient capacity shall be installed near the cutting press for versine curve, screwing test & marking/stamping work.

2.1.5 Bench Grinder: A Bench Grinder shall be provided near cutting press to remove the sharp edges/burrs from the Steel Washers, so formed.

2.1.6 Gauge for checking accuracy of Steel Washers: One set of Go/No Go gauges should be available to check the correctness of inner/outer Diameter, coiled height & end gap.

2.1.7 Heating Furnace: The heating furnace shall be indirect heating type. It may be rotary hearty or walking beam type. The furnace shall be fitted be automatic temperature control device & continuous temperature recorder.

2.1.8 Oil Quenching Tank: The Oil Quenching Tank shall be of adequate length, width & depth, preferably be fitted with a conveyor belt passing through the oil. The speed of a conveyor belt shall be adjusted in such a way that the clip to be in oil for at least 6 minutes. The oil tank shall be fitted with necessary cooling arrangement & the temperature of oil shall not exceed 70 degrees centigrade. The oil tank shall be fitted with temperature recorder preferably of continuous type.

2.1.9 Tempering Furnace: The tempering furnace may be oil/gas fired tunnel type fitted with conveyor system or it may be electrical well type. The furnace shall be fitted with thermo-couples to sense the temperature at three points along its length to ensure constant temperature zone along length of the furnace. The speed of the conveyor shall be adjusted in such a way that the Steel Washers should be in tempering furnace for minimum period of 45 minutes. The furnace fitted with an automatic

temperature control device and continuous temperature recorder. For holding the Steel Washers in the furnace suitable arrangement which permits free air circulation around the Steel Washers shall be used.

2.2 TESTING FACILITIES:

A separate laboratory room, which shall be well lit, clean and properly ventilated and provided with easilymaintainable floor and platform should be available at the works.

2.2.1 Load Testing Machine: Load testing machine of sufficient capacity shall be installed for conducting flattening tests, decompressiontest and residual load test

2.2.2 Chemical Testing: Necessary equipment shall be procured for laboratory to analyse Carbon, Sulphur, Phosphorous, Silicon, and Manganese etc.

2.2.3 Hardness Tester: Two proving rings of sufficient capacity should be available for use with the toe load test arrangement available in laboratory.

2.2.4 Inspection Gauges: The two sets inspection gauges as per RDSO drawing shall be manufactured by the supplier for product inspection.

2.2.5 Polishing Machine: Polishing Machine with all necessary items shall be available to prepare samples for decarb testing.

2.2.6 Protective Coating Arrangement: Proper arrangement for protective oil coating should be available at the firm's premises.

2.2.7 Tool room cum die making/repair shop facility: "All necessary tools and machines such as Surface Grinding Machine, Lathe Machine, Cutting Machine and necessary tools with measurement gauges such as surface plate, height gauges and vernier with a least count of 0.02 mm should be available in the tool room for manufacturing of gauges and dies".

2.2.8 Calibration of test equipments: All the test equipments shall be periodically checked and calibrated. The frequency of calibration shall be once in a year. Calibration of all equipments other than dimensional inspection gauges shall be got done from outside Government laboratory or from Labs accredited by Accreditation agency as per extant guideline issued by RDSO or National Test House or Regional Test Centre (RTC).

2.3 QUALITY CONTROL REQUIREMENTS:

There should be a quality control system for manufacturing process of product commencing from raw material stage. The Quality Assurance Programme (QAP) for the product should cover following aspects:

i) Organizational Chart
ii) Process Flow Chart
iii) Methodology of Process Control
iv) Details of Plants and machinery including its size and other details as per STR.
v) Details of calibration of testing / measuring instruments.

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