APPENDIX "D"

SRI LANKA RAILWAYS SPECIFICATION NO. 516

SPECIFICATION AND TESTS FOR MOULDED SOLID RUBBER RAIL PADS

1. SCOPE AND INTRODUCTION

This specification covers the requirements for moulded rubber rail pads for use between flat bottom rail and concrete sleepers to provide a bearing surface and as electrically insulating layer.

2. REFERENCES

ISO 37	Rubber vulcanized – determination of tensile stress – strain properties
ISO 48	Vulcanized rubbers – Determination of hardness (hardness between 30 & 80 IRHD)
ISO 188	Rubber, vulcanized – Accelerated ageing or heat resistance tests deflection at normal & high temperatures.
ISO 815	Vulcanized rubbers – Determination of compression set under constant deflection at normal and high temperatures.
ISO 1431	Vulcanized rubber – Determination of resistance to ozone cracking under static conditions
ISO 1653	Vulcanized rubbers – Determination of compression set under constant deflection at low temperatures
ISO 2285	Vulcanized rubber – Determination of tension set under constant elongation at normal and high temperatures.
ISO 2878	Rubber, vulcanized – Antistatic and conductive products – Determination of electrical resistance.
ISO 3302	Rubber – Dimensional tolerances of solid moulded and extruded products.

3. TYPE OF MATERIAL

Only one type of material in the table with nominal hardness 65 – 75 IRID.

4. MATERIAL AND WORKMANSHIP

4.1 All materials and workmanship shall be in accordance with good commercial practice.

4.2 Pads shall be free from porosity, significant surface defects and dimensional irregularities

4.3 All materials shall be black.

DIMENSIONS & TOLERANCES

Dimensions shall be the subjects of an agreement between the interested parties Tolerances shall be in accordance with the SLR Drawing No. 19882 A.

6 GENERAL REQUIREMENTS

6.1 Test Pieces

Test pieces shall be cut from the finished product. If they cannot be so prepared, they shall be taken from moulded test slabs of suitable dimensions made from the same batch of material used for the pads and vulcanized under conditions, which are comparable with the conditions used in production.

6.2 Hardness

The hardness shall comply with the requirements of table 1 when tested in accordance with the method specified in ISO 48.

6.3 Tensile stress-strain properties

The tensile strength, elongation at break, and stress at 100 percent elongation shall comply with the requirements of table 1 when tested in accordance with the method specified in ISO 37 using a dumb-bell test pieces.

6.4 Compression set

The compression set shall comply with the requirements of table 1 after 22 h at 100° C under a compression of 50 percent when tested in accordance with the method specified in ISO 815.

6.5 Tension Set

The tension set shall comply with the requirements of table 1 after 22 h at 100° C under and elongation of 50 percent when tested in accordance with the method specified in ISO 2285.

6.6 Accelerated Ageing

After test pieces have been aged for 3 days at 100° C in accordance with the method specified in ISO 188, the change in hardness, tensile strength elongation at break and stress at 100 percent elongation shall comply with the requirements of table 1.

7. Special Requirements

These requirements are optional and shall be the subject of an agreement between the interested parties.

7.1 Ozone resistance

The test pieces shall show no cracks after 100 h at 40° C under and elongation of 20 percent at an ozone concentration of 200 pphm when tested in accordance with the method specified in ISO 1431.

7.2 Low temperature compression set

The compression set shall comply with the requirements of table 2 after 22 h at - 25° C when tested in accordance with the method specified in ISO 1653.

7.3 Electrical resistance

The electrical resistance shall comply with the requirements of table 2 when tested on one surface in accordance with the method specified in ISO 2878.

7.4 Load deflection

The load deflection test shall be carried out on two test pads. The pad under test shall be compressed between two smooth steel plates sufficiently rigid to withstand any stress imposed during the test without bending and of sufficient size to ensure that the entire compressed pad is within the area of the plates. One plate be flat and the other either flat or compared to match the specified profile of the pad.

The test pad shall then be subjected to two conditioning deformations with a maximum load applied of 20 Mg and then released as rapidly as possible.

An initial load of 0.25 Mg shall be applied and the deformation gauge set to zero. The test pad shall then be compressed by successive increments of load must not exceed 10 seconds and the average deformation of the pad must be recorded for each load.

The test shall be carried out at standard laboratory temperature.

TABLE 1 – GENERAL REQUIREMENTS

PROPERTY	UNIT	LIMITS	DOCUMENTS SPECIFYING TEST METHOD
Hardness	IRHD	65 - 75	ISO 48
Tensile Strength Min	MPa	12	ISO 37
Elongation at Break, Min	%	250	ISO 37
Stress at 100% Elongation	MPa	3 - 5	ISO 37
Compression Set after 22 H at 100° C and 50% Compression, Max	%	30	ISO 815
Tension Set after 22 h at 100° C and 50% Elongation, Max	%	25	ISO 2285
Maximum Change from unaged values after ageing 3 days at 100° C			
Hardness	IRHD	+ 10 -	ISO 188 + ISO 48
Tensile Strength	%	30	ISO 188 + ISO 37
Elongation at Break	%	40	ISO 188 + ISO 37
Stress at 100% Elongation	%	40	ISO 188 + ISO 37

TABLE 2 – SPECIAL REQUIREMENTS

PROPERTY	UNIT	LIMITS	DOCUMENTS SPECIFYINF TEST METHOD
Ozone resistance 200 pphm elongation 20%, duration 100 h at 40° C	-	No cracking	ISO 1431
Low-temperature compression set 22 h at - 25° C, max	%	65	ISO 1431
Electrical resistance measured on one surface	M	100 - 800	ISO 2878

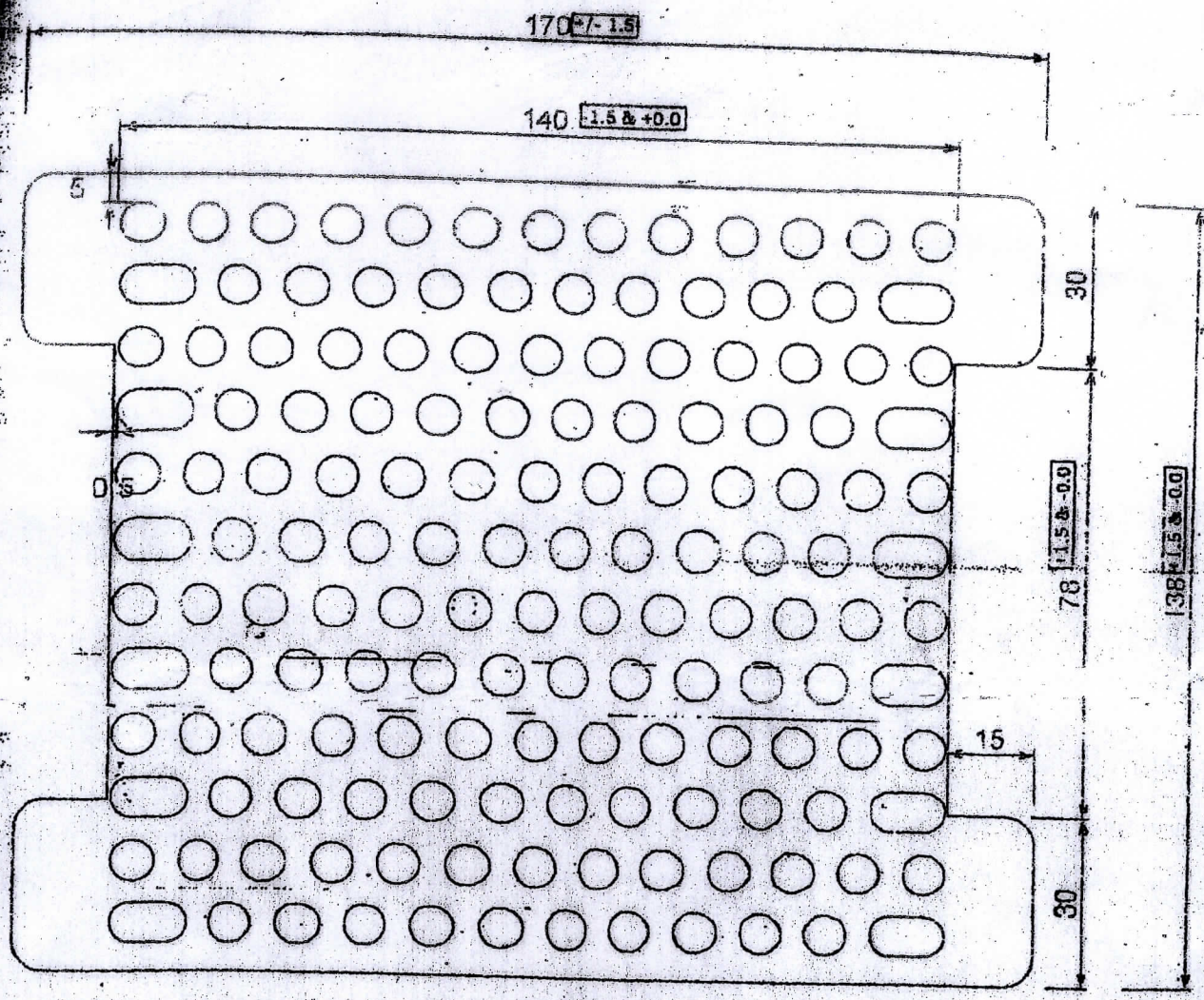
All tenderers should submit the following samples:

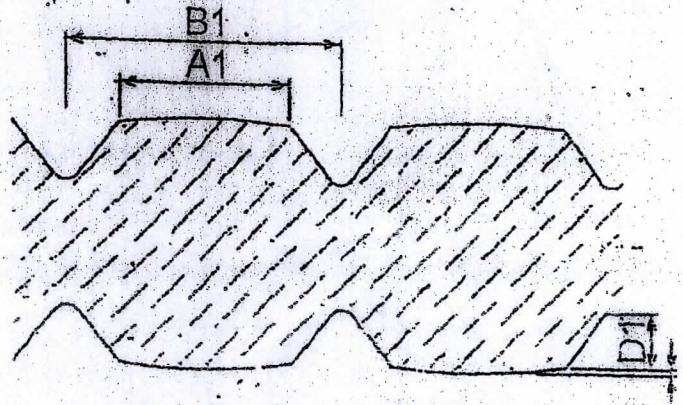
1) 05 (five) samples of each item offered.
2) **500 grams unvulcanized rubber compound.**

SRI LANKA RAILWAYS

STUDDED RUBBER RESILIENT RAIL PAD FOR 80 *lbs* CONCRETE SLEEPER

Drg. No.
19882 / A
AMENDED





A1 - 7.0
B1 - 11.0
C1 - 0.25
D1 - 2.25

CROSS SECTION

SRI LANKA RAILWAYS
WAY & WORKS DEPARTMENT