

HEVEA RUBBER TECHNOLOGIES PVT. LTD.

A Padinjarekara Group Company • Poovanthuruthu, Kottayam, Kerala

SCHEDULE OF TECHNICAL REQUIREMENT (STR) — EQUIPMENT & TESTING-FACILITIES CHART

POT-PTFE Bearings for Indian Railways / ROB | Ref. RDSO Doc. No. BS-S-7.5.3.1-12, Version 2.0 (Effective 01.07.2026)

Compliance to STR Para 6.3, 6.3.1, 6.4, 6.5, 6.6 & 6.7

MOU on record: Hevea holds an executed MOU with Barath Metallurgical Laboratory Pvt. Ltd. (NABL accredited), Nazarathpet, Chennai-600123, dated 23.06.2026, valid 65 months (up to 23.11.2031), Rubber Research India and Matrix Inspection and Engineering Services. Scope covers physical & chemical testing of Mild Steel, Stainless Steel, Brass Sealing Rings and Bolts & Nuts (MOU Sec. 3.1–3.4) plus Compressive Strength, Ultrasonic (UT) and Liquid Penetration (LPT/DPT) testing (MOU Sec. 3.5). This covers the whole of Para 6.4(i)–(vii), all marked out-sourced below with the in-house equipment columns as N/A.

Para 6.3 — Laboratory facilities for testing of Elastomer • MANDATORY IN-HOUSE

Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
(i)	Universal tensile strength testing facility	As per IRC:83 (Pt-III)	Universal Testing Machine (UTM) — rubber tensile	Hydropak	001	001	600 metric tons	1	1998	In-house	—
(ii)	Compression set testing apparatus	As per IRC:83 (Pt-III)	Compression Set apparatus	Fabricated in house	002	002	6 numbers per test	1	2005	In-house	—
(iii)	Viscometer to check viscosity of adhesive	As per IRC:83 (Pt-III)	Viscometer (for adhesive)	Satron Meditech	003	003	30 mL	1	2024	In-house	—
(iv)	Minimum two (2) Shore hardness testers with standard test pieces	As per IRC:83 (Pt-III)	Shore-A Hardness Tester (min. 2 nos.)	Excel	Shore III - Analog	004, 005	25 Shore A to 90 Shore A	2	2023	In-house	—
(v)	Specific gravity testing apparatus	As per IRC:83 (Pt-III)	Specific Gravity / Density apparatus	Hallmark Mechatronics	PRACTUM 213-10IN	38302831	210 g	1	2022	In-house	—
(vi)	Ash content testing facility	As per IRC:83 (Pt-III)	Muffle Furnace (ash content)	Kemi	TC244	1329	Amb to 1000 °C	1	2024	In-house	—

Para 6.3.1 — Laboratory facilities for testing of Elastomer • IN-HOUSE or OUTSOURCED (NABL MOU ≥ 65 months if outsourced)

Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
(i)	Rubber/Elastomer testing for ozone resistance	ISO 1431-1	Ozone Testing Chamber	Ozone India Technology	OZ-INDIA-OCT	OZ-INDIA-949	220 V	1	2022	In-house	—
(ii)	Polymer content testing	ASTM D-297	Polymer content test set-up	Chemicals and Reagents	N/A	N/A	N/A	N/A	N/A	N/A	—
(iii)	Polymer identification testing	IS 3400 (Part XXII)	Polymer identification set-up	Chemicals and Reagents	N/A	N/A	N/A	N/A	N/A	N/A	—
(iv)	Pyrolysis testing facilities	IS 3400 (Part XXII)	Pyrolysis / TGA set-up	LCGC Bio Analytic Solution	B60/00700	TGA-22-0021	1100 °C	1	2023	In-house	—
(v)	Percentage polymer content	IS 3400 (Part XXII)	Thermogravimetric Analyzer (TGA)	LCGC Bio Analytic Solution	B60/00700	TGA-22-0021	1100 °C	1	2023	In-house	—
(vi)	Adhesion strength of elastomer to steel plate	IS 3400 (Part XIV, A)	UTM with adhesion (peel) fixture	Scientific Equipment & Testing	2	71/99	0–500 N, 100 N–500 N	1	1999	In-house	—
(vii)	Rubber/Elastomer testing with Spectrophotometer	ASTM D3677	MoU of the Rubber Board	N/A	N/A	N/A	N/A	N/A	N/A	N/A	MoU with Rubber Board

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Para 6.4 — Test facilities for Mild Steel, Stainless Steel, Brass Sealing Ring, PTFE · IN-HOUSE or OUTSOURCED (NABL MOU ≥ 65 months if outsourced)

Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
(i)	Compressive & Tensile strength testing facility	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Barath Metallurgical Laboratory Pvt. Ltd. (NABL), Chennai. MOU dtd 23.06.2026, valid 65 months (to 23.11.2031). Compressive — MOU Sec. 3.5; Tensile — MOU Sec. 3.1–3.4.
(ii)	Bend stress testing facilities	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Barath Metallurgical Laboratory Pvt. Ltd. (NABL), Chennai. MOU dtd 23.06.2026, valid 65 months (to 23.11.2031). Bend Test — MOU Sec. 3.1.
(iii)	Impact strength testing facilities	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Barath Metallurgical Laboratory Pvt. Ltd. (NABL), Chennai. MOU dtd 23.06.2026, valid 65 months (to 23.11.2031). Impact Test 0/–20 °C — MOU Sec. 3.1.
(iv)	Hardness testing facilities	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Barath Metallurgical Laboratory Pvt. Ltd. (NABL), Chennai. MOU dtd 23.06.2026, valid 65 months (to 23.11.2031). Hardness — MOU Sec. 3.2/3.3/3.4.
(v)	Chemical testing for determination of chemical composition	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Barath Metallurgical Laboratory Pvt. Ltd. (NABL), Chennai. MOU dtd 23.06.2026, valid 65 months (to 23.11.2031). Chemical composition — MOU Sec. 3.1–3.4.
(vi)	Ultrasonic testing (UT) facilities	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Matrix (See MOU)

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Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
(vii)	Liquid penetration testing (LPT) facilities	As per IRC:83 (Pt-III)	N/A (out-sourced)	N/A	N/A	N/A	N/A	N/A	N/A	Out-sourced	Out-sourced to Matrix (See MOU)

Para 6.5 — Laboratory facilities for testing of POT-PTFE Bearing · MANDATORY IN-HOUSE

Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
(i)	Proof load testing facilities	IRC:83 (Pt-III), Para 7.4.3.1	Proof-Load / Compression Testing Machine	IPA	FC025H9, FC025H9, FC025H9	134519, 139599, 134419	600 T	1	2019	In-house	—
(ii)	Friction testing facilities	IRC:83 (Pt-III), Para 7.4.3.2	Friction (coefficient) test rig	IPA	FC025H9, FC025H9, FC025H9	134519, 139599, 134419	600 T	1	2019	In-house	—
(iii)	Rotation testing facilities	IRC:83 (Pt-III), Para 7.4.3.3	Rotation test set-up	IPA	FC025H9, FC025H9, FC025H9	134519, 139599, 134419	600 T	1	2019	In-house	—

Para 6.6 — Machines / equipment available for supply of POT-PTFE Bearings

Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
1	Oxy-acetylene gas profile cutting equipment of adequate size	N/A	Gas profile cutting m/c	ESAB	N/A	N/A	50 mm	1	2012	In-house	—
2	Straight cutting equipment	N/A	Straight cutting m/c	Accural	MS7-6X3200	22250228	—	1	2025	In-house	—
3	Radial drilling machine of adequate capacity	N/A	Radial drilling m/c	Siddhapuram Machine Tools / Parmar Machine Tools	PMT-R2	SMTRII 04/24	800/32 mm; 800/32 mm	1; 1	2024; 2006	In-house	—
4	Lathe machine	N/A	Lathe	Udya Machine Tools	HLM2	835	N/A	3	1997	In-house	—
5	Planner or Shaper machine	N/A	Planer / Shaper	Omega	N/A	N/A	N/A	—	—	In-house	—
6	Buffing machine	N/A	Buffing m/c	Dewalt	DWE493	54675	8500/min	2	2024	In-house	—
7	Welding rectifier / transformer	N/A	Welding rectifier / transformer	Panasonic	YD400AT3	YD400AT3DJR	N/A	3	2015	In-house	—
8	Portable pneumatic tools — grinders, drilling, chipping (adequate nos.)	N/A	Pneumatic tool set	Ibell	AG10-72	IBL AG10 7202260904	N/A	5	2026	In-house	—
9	Facilities for surface preparation / painting / metalizing	N/A	Surface prep / painting set-up	Patel Furnace	3398	N/A	1 m/min	1	2024	In-house	—
10	Elcometer or dry film thickness gauge	N/A	Elcometer / DFT gauge	R&D TC100	TC100	HRT/10	1300 µm	1	2025	In-house	—
11	Adhesive spraying facilities with in-built stirring provision	N/A	Adhesive spray unit (with stirrer)	Sumith Engineering	SC24SM09	—	—	1	2025	In-house	—
12	Measuring instruments — micrometers, dial gauges, vernier calipers, Go/No-Go gauges (adequate nos.)	N/A	Precision measuring instruments	Mitutoyo	2024S	LGN436 / QCX750	10 mm	5	2020	In-house	—
13	Automatic weighing system	N/A	Automatic weighing system	Orion Automation System	OP100	PP20620	100 kg	1	2022	In-house	—

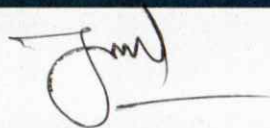
Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
14	Coating Machine	N/A	Coating / Painting	Summit Engineers	N/A	N/A	1 m/min	1	2025	In-house	—

Para 6.7 — Additional Machines / equipment available for supply of POT-PTFE Bearings

Sl. No.	Facility / Machine required (as per STR)	Test method / Standard	Equipment / Machine provided	Make	Model No.	Serial No. / M/c No.	Capacity	Qty.	Year of Mfg. / Comm.	In-house / Out-sourced	Remarks (MOU / NABL Lab ref.)
1	Rheometer (MDR)	N/A	Rheological Studies	Micro Vision	MV-MDR	1082	20 N-m	1	2022	In-house	—
2	Air Ovens	IS 3400 (Part 4)	Heating Ovens	ACE	AP-S-72	NE/53/65	300 °C	1	2022	In-house	—
3	Muffle Furnace	IS 3400 (Part 22)	Ash Content Studies	Kemi	TC244	1329	Amb to 1000 °C	1	2024	In-house	—
4	Pneumatic Specimen Cutter	N/A	Die based cutting	Accural	MS7-6X3200	22250228	—	1	2025	In-house	—
5	Universal Testing Machine for Rubber Testing	IS 3400 (Part 1)	Physical Properties of Rubber	Scientific Equipment & Testing	2	71/99	0–500 N, 100 N–500 N	1	1999	In-house	—
6	Universal Testing Machine for Steel Testing	IS 1608 (Part 1)	Yield, elongation and Ultimate Tensile Strength	Krystal Equipment	UTK-40E	2014/1087	400 kN	1	2014	In-house	—
7	Profile meter	IS 3073	To check the profile and roughness	Positector 6000	Positector	N/A	0 to 200 µm	1	2025	In-house	—
8	Ozone Chamber	ISO 1431-1	Ozone resistance chamber	Ozone India Technology	OZ-INDIA-OCT	OZ-INDIA-949	—	1	2023	In-house	—
9	Lab Press	N/A	Test-slab moulding press	Micro Vision	HT-160	—	200 °C	1	2018	In-house	—
10	Straight Edge for Flatness	IRC 83	Flatness check	Kristal	—	—	910 mm	1	2019	In-house	—
11	Parallelism meter	IRC 83	Parallelism check	Mitutoyo	20465	—	10 mm	1	2019	In-house	—

Declaration (ref. STR Para 6.8)

The undersigned, an authorised signatory (as per Annexure-4) of M/s Hevea Rubber Technologies Pvt. Ltd., gives an undertaking that the entire in-house manufacturing and testing facilities can accomplish the manufacture and testing of POT-PTFE Bearing as per IRC:83-2018 (Part-III); outsourced testing facilities (where indicated) have been seen / checked and found in order as per IRC:83-2018 (Part-III).

Prepared By	Verified By	Authorised Signatory
		

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