TRICON POLYMERS MUMBAI

PRODUCT - ELASTOMERIC - 3100417 (ITEM ID)

REGISTRATION ID - 68846

clause no. 6.3 6.3.1 6.4 **ANNEXURE -1**

Equiptments Available.

#	MACHINE NAME	SIZE/CAPACITY	MAKE	CONNECTING LOAD	clause	QTY.
1	Rubber Mixing Mill	Φ18" x 44"	Modern	3-PH, 415 V		1
2	Electrical Weighing Machine	Max 150 & 300 kg	Essack	220 V		3
3	Bench Grinder	0.5H.P	Sun Rise	3-PH		2
4	Kneader	35 liters	Slac Rubber Mac pvt.ltd.	3-PH, 415 V, 40HP MOTOR		1
5	Rubber Mixing Mill	Φ12" x 30"	G.G. ENGG.WORKS	3-PH, 415 V,80A, 60HP MOTOR	6.3.11	1
6	Hydraulic Bale Cutter	100 Ton	Mannu Mechanical Engg.	3- PH		1
7	Valcaniser	12' X 4'	G.G. ENGG.	-		1
8	Rubber Extruder	4 1/2"	G.G Engg.	3-PH, 20 HP MOTOR		1
9	Rubber Extruder	2 1/2"	Modern	3-PH,5 HP MOTOR		1
10	Hydraulic Press (1)	32" x 32"	Vishwakarma	3- PH		1
11	Hydraulic Press (3)	26" X 34"	Durga	3- PH		1
12	Hydraulic Press (2)	24" X 24"	Local	3- PH		1

#	MACHINE NAME	SIZE/CAPACITY	MAKE	CONNECTING LOAD	clause	QTY.
13	Hand Grinder/Chipping	5"	Dewalt	220V		7
14	Heating oven	36" x 36"	Local			1
15	Biaxial Testing Machine	Vertical - 1200/2000 MT	Vishwakarma	10 HP	6.3.2/6.3.3/6.3.4	1
		Horizontal - 120/150/200 MT			6.3.2/6.3.3/6.3.4	1
16	Moulding Press	30" x 30"	-	10 HP		1
17	Moulding Press	24" X 24"	-	7.5 HP		1
18	Biaxial Testing Machine	Vertical - 1000 MT	Vishwakarma	10 HP		1
19	Ultrasonic testing maching	-	RTUL	NA	6.4.6	1
20	Hydraulic jack	A = 1105 cm^2, 600Ton	KEL	5 HP		1
21	Hydraulic jack	A = 3630 cm^3, 1000 Ton	KEL	5 HP		1
22	Over head crane with chain pully block	2 Ton & 3 Ton	-	3 HP		4
23	Air Compressor/spray	12Kg	LG	3-PH		3
24	Hydraulic Power Pack	700 kg/cm2	Tangee	415v		1
25	Hydraulic Power Pack	220 kg/cm2	Nikhil Hydraulics	230v		1
26	Steam Generator (Boiler)	100 kg/hr	Neotech	3-PH		1
27	Dies and Transfer Moulds	Available	various sizes			500+
28	Radial Drilling Machine	60 mm	hmt	5 hp		3
29	Shearing and Cutting	2.5 mtr		7.5 hp		2
30	Grinder/buffing	7 inchs max	Dewalt	0.5 hp		5
31	grit blasting machine	40 inc dia		7.5 hp		2

#	MACHINE NAME	SIZE/CAPACITY	MAKE	CONNECTING LOAD	clause	QTY.
1	Lathe Machine 1	12'	Punjab	3-PH, 415 V		1
2	Lathe Machine 2	10'	Gujrat	3-PH, 415 V		1
3	Lathe Machine 3	8'	Punjab	3-PH, 415 V, 2.2KW,5A,3-HE MOTOR		1
4	Lathe Machine 4	10'	Gujrat	3-PH, 415 V		1
5	Lathe Machine 5	8'	Gujrat	3-PH, 415 V, 2.2KW,5A,3-HE MOTOR		1
6	Cylidrical Grinder	40" Length	Riasons	3-PH, 415V		1
7	Binder Roller	Roller L=60"	DYNAMIC	220 V, 4A, 1-PH		1
8	Roller Binder With Lathe + Extruder	Lathe - 10' + extr - 4"	Local	-		1
9	Hydraulic Press	10" X 10"	Vishwakarma	3- PH		1

Testing Equiptments

#	MACHINE NAME	SIZE/CAPACITY	MAKE	CONNECTING LOAD	clauses	QTY.
10	Tensile Testing M/C/Digital	Cap. 250kgf	Stech Engrs	1 phase	6.3.1/6.3.1.7/6.4.2	1
11	Shore Hardness Tester	100 Shore - 'A'	Blue Steel Engg	NA	6.3.10	4
12	Dumbell Shape Cutter	2 MMTHICK Rubber Sheet	Stech Engrs	NA		2
13	Abrasion Tester	Dia 150 x 450 L	Stech Engrs	1 HP		1
14	Weighing Balance	200gms	Electrona	1 phase		1
15	Muffle furnace (Ash)/pyrolysis	1000^0c	Stech Engrs	230V, 1.6KW,6.2 A	6.3.1.3/6.3.1.5/6.3.1.6/6.4.1	1
16	Compression set	-	Local	-	6.3.9	1
17	Ageing Oven	250^0c	Allied Scientific Inds.	230V, 1.5KW, 6.8A	6.3.8	2
18	Dessicator	-	-	-		1
19	Vernier Caliper	300 mm & 600 mm	Mitutoyo	NA		4
20	Dial Indicator	10 mm & 50 mm	Mitutoyo	NA		10

#	MACHINE NAME	SIZE/CAPACITY	MAKE	CONNECTING LOAD	clauses	QTY.
21	Micrometers(internal/disc)	0 to 150 mm	Mitutoyo	NA		6
22	Thickness Gauge	10 mm	Baker	NA		2
23	Polymer Content Test Apparatus /	-	Shanti Scientific	230v	6.3.1.2/6.3.1.4/6.3.1.8	1
24	Coating Thickness Gauge	0-1500-2000µ	Caltech Engg	NA		1
25	Digital Weighing Balance	100 gms	Stech Engrs	1 phase		1
26	IRHD Hardness Tester	100 IRHD	Stech Engrs	NA		1
27	Digital Shore Hardness Tester	100 Shore - 'A'	Stech Engrs	-		1
28	Micrometers(internal/disc)	0 to 150 mm	Mitutoyo	NA		6
29	Viscometer/elcometre		elcoat		6.3.12	1
30	Digital Specific Gravity/Density		Stech/engnrs		6.3.13	1
31	ozone testing	100 pphm	Future Foundation	2 hp	6.3.1.1	1
32	liquid penetration	inhouse			6.4.7	
33	bend stress/impact strength/(ino)	nabl lab	ino lab (mou)		6.4.2/6.4.3/6.4.4/6.4.5	
34	Oscillating Disc Rheometer	20 N	Future Foundation	2 HP		1
35	Cooling Tower	36" x 36"	Himagiri	1 HP		1
36	Calibration cert.	various instruments	Annexure Enclosed		6.3.5/6.3.6/6.3.7	

M/s.TRICON POLYMERS PVT . LTD ,MUMBAI

CALIBRATION CERTIFICATE

Sl. No.		Name of Equipment	Make, Model Sl. No. / ID No.	Range & Least Count	Laboratory Details				F/CAL/01	Reviewed on: 04.08.2026
					Calibrated By	Calibration Certificate No.	Date of Calibration	Next date of Calibration	Description, Lab ID No. Calibration Certificate No., Validity Upto	NABL Accreditation Details
(1)		(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	i	TENSILE TESTING MACHINE	11069; M/C-137	0-2500 N	CHIRAG CONSULTANTS	CC/TEN/270526/1747	27.05.2026	26.05.2027	CC24042600000081F	CC-2404
2	i	TENSILE TESTING MACHINE	10420	0-250 kgf.	STECH ENGINEERS	SE/RC/TPPL/0430/25-26	18.12.2025	17.12.2026	FRI/08/24/16116	-
3	i	DIAL THICKNESS GAUGE	DKA707	0.01mm/0-10 mm	VAIBHAV	P022503325	12.02.2026	11.02.2027	CC224125010000245F	CC-2356
4	i.	DIAL INDICATOR 0-100MM	9MM451	0.01mm/0-100 mm	SARAF IDL	SIDL/260407/021	07.04.2026	07.04.2027	CC376626000002529F	CC-3766
	ii.	DIAL INDICATOR 0-100MM	EKF117	0.01mm/0-100 mm	SARAF IDL	SIDL/260511/11	11.05.2026	11.05.2027	CC376626000003536F	CC-3766
	iii.	DIAL INDICATOR 0-50MM	DI-04	0.01mm/0-50 mm	VAIBHAV	P022503328	12.02.2026	11.02.2027	CC224125010000248F	CC-2356
	iv.	DIAL INDICATOR 0-50MM	DI-06	0.01mm/0-50 mm	VAIBHAV	P022503326	12.02.2026	11.02.2027	CC224125010000246F	CC-2356
	v.	DIAL INDICATOR 0-50MM	DI-07	0.01mm/0-50 mm	VAIBHAV	P022503327	12.02.2026	11.02.2027	CC224125010000247F	CC-2356
	vi.	DIAL INDICATOR 0-50MM	DI-08	0.01mm/0-50 mm	VAIBHAV	P022503329	12.02.2026	11.02.2027	CC224125010000249F	CC-2356
5	i.	GUAGE 0-1000 kg/cm2	EN837-1	0-1000 kg/cm2 5kg/cm2	RELIABLE	2025/RCT-11/27/1	20.11.2025	19.11.2026	CC446025000001647F	CC-4460
6	i.	GUAGE 0-700 kg/cm2	HP-13/PG-01	0-700 kg/cm2 5kg/cm2	RELIABLE	2025/RCT-11/27/2	20.11.2025	19.11.2026	CC446025000001648F	CC-4460
7	i.	GUAGE 0-700 kg/cm2	D19210	0-700 kg/cm2 10kg/cm2	RELIABLE	2026/RCT-1/18/1	27.01.2026	26.01.2027	CC446026000000352F	CC-4460
8	i.	GUAGE 0-700 kg/cm2	125	0-700 kg/cm2 10kg/cm2	RELIABLE	2026/RCT-1/18/2	27.01.2026	26.01.2027	CC446026000000353F	CC-4460
9	i	Shore Hardness Tester	3442	0-100° SHORE A 1° SHORE A	VAIBHAV	ME.2024/12/12/001	11.12.2025	10.12.2026	CC235624000007051F	CC-2356
10	i	Oven - lab	7298/TC-01	0-400 ℃/ 1℃	RELIABLE	2025/RTI-1/18/3	27.01.2026	26.01.2027	CC376025000000169F	CC-4460
11	i	Ash Oven - lab	7300	0-1200 ℃/1℃	RELIABLE	2025/RTI-1/18/4	25.02.2026	24.02.2027	CC376025000000170F	CC-3760
12	i	Vernier Caliper	EA1329	0-300 mm /0.01 mm	VAIBHAV	ME.2026/06/25/02	05.06.2026	04.06.2027	CC235626000005696F	CC-2356
13	i	Digital Weighing Balance	15495	0.001-100 grms	STECH ENGINEERS	SE/RC/TPPL/0063/25-26	20.05.2026	19.05.2027	IK/2024/25	-
14	i	Dumbell Cutting Die	7997	6.0x25x33x25	STECH ENGINEERS	SE/TPPL/0109/26-27	23.06.2026	22.06.2027	LH/45857/009	-
15	i	Angle Tear Die	7483	19.0x12.70x25.0x90°	STECH ENGINEERS	SE/TPPL/0110/26-27	23.06.2026	22.06.2027	LH/45857/009	-
16	i	Measuring Tape	MT - 02	0-5000 mm/ 1 mm	VAIBHAV	ME.2026/02/12/001	12.02.2026	11.02.2027	CC235626000000455F	CC-2356

VERIFIED BY
Mr. VINAY KUMAR
Sr. QA/QC

DOCUMENT MADE BY
Mr. SATEJ KADAM
QA/QC

QUALITY ASSURANCE PLAN FOR ELASTOMERIC BEARINGS
(IRC-83 ,PART-II 2018)

1.Name of Manufacture :
2. Drg. No. :
3.Name of Project/Railway :
4. Authority (CA No./LOA No./Order No.) :

5. Client :
6 Qap No.

SL. No.	Component Operation	Characteristic Checks & Tolerances	Frequency & Type of check	Reference Document	Fabricator's quality control	Inspection details		Type of Records	Acceptance criteria	Remarks
						Inspecting Agency	Extent of Inspection			
1	2	3	4	5	6	7	8	9	10	11
1.0 1.1	**RAW MATERIAL** Elastomer (Only virgin Polychloropr ene (CR) is permitted & preferable grades are- Neoprene WRT, Bayprene 110, Skyprene B-5 and Denka S-40V)	**Physical Test** With values of characteristics specified a) Hardness b) Min. Tensile strength c) Min. Elong. at break d) Max. Compression set e) Accelerated ageing test I) Max. Change in Hardness II) Max. Change in Tensile strength III) Max.Change in Elongation. (f) Adhesion strength of Elastomer to Steel Plates (g) Min. Tear resistance	As per manufacturer certificate & test required by Authorized inspector of zonal Railway from Govt./ NABL approved lab IRHD (60 ± 5) 16 MPa 425% 15% 100 ^{o} c for 72 Hours ±5 w.r.t. value of(a) ±15% w.r.t. value of(b) ±25% w.r.t. value of(c) Min. 7 KN/m Min. 10 KN/m	Manufacturer test certificate & Challan or NABL Lab Certificate	Verification of reference document.	Consignee	From batches at Random and at discretion of Inspector	Fabricato rs record.	IRC:83 (Part-II)-2018 (as per relevant test procedure)	Review of Test Certificates is required Test Certificate shall be furnished by manufacturers for following tests. (i) Composition (ii) Hardness (iii) Tensile strength (iv) Elongation at Break (v) Compression Set (vi) Accelerated ageing test (vii) Adhesion Strength **IMPORTANT:** Properties of Elastomer should be as per Table 1 of IRC:83-2018 Part-II Polychloroprene Content not less than 50 % Ash content not more than 5% Note: (i) No reclaimed rubber, vulcanized wastes or natural rubber shall be used. (ii) EPDM (Ethyle propylene Dimonomer), IIR (Isobutane Isoprene Copolymer), CIIR (Chloro-Isoprene Copolymer) are not permitted for manufacture of bearings. Adhesion strength test to be conducted as per IS: 3400 Part XIV Method A

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1	2	3	4	5	6	7	8	9	10	11
1.1 Cont.	Elastomer	**Chemical Test** i) Determination / Identification of polymer	As per manufacturer certificate & test required by Authorized inspector of zonal Railway from Govt./ NABL approved lab	Manufacturer test certificate / NABL Report	Verification of reference document.	Consignee	From batches at Random	Fabricators record.	IRC:83 (Part-II) - 2018 Ash content as per IS:3400 part XXII and Pholychloroprene content as per ASTM-D297 as per relevant test procedure Identification of polymer as per ASTM D3677 (as per relevant test procedure) May be done at a mutually agreed eternal government lab	Examination of Test Certificates is required Test Certificate shall be furnished by manufacturers for following tests. (i) Polymer Identification (ii) Polymer content (iii) Ash content (iv) Specific gravity (V) Ozone resistance **Preferably test of polymer identification, polymer content and Ash content should be either witnessed or sealed sample to be sent to NABL LAB for evaluation.** **Note:** For acceptance testing level I, **(a)** Ash content on specimen from test bearing shall be compared with those for specially moulded test pieces and Max variation permitted is ± 0.5% **(b)** Specific gravity on specimen from test bearing shall be compared with those for specially moulded test pieces and Max variation permitted is ± 0.2% **(c)** For other test max. and min. limits to be adhered. **(d)** Ozone resistance can be waived by test engineer as per note 2 of Para 7.9.1.2 of IRC:83-2018 Part II
		ii) Ash content	Max 5%		-do-	-do-				
		iii) Specific Gravity			-do-	-do-				
		iv) Polymer Content	Not less than 50%	NABL Report	-do-	-do-				
		v) Ozone Resistance	100 pphm 30% Strain 40℃±2℃ For 96hrs		-do-	-do-				

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1	2	3	4	5	6	7	8	9	10	11
1.2	Mild Steel	Mechanical Test UTS, Yield Stress, Elongation%, Bend test Chemical Test C, Mn, Si, P, S, CE. Physical condition i.e. Pitting,rusting,rolling defect, etc. Ultrasonic Testing of plates (100% for12mm & above thick plates)	As per Mill TC / Lab test certificate reviewed by authorized inspector	TC from Govt. Lab / NABL approved Lab & MTC	Verification of reference document.	Consignee	Review of internal document 100% for 12mm & above thick plates	Fabricators record & Co- related with Mill TC & test report.	IS: 2062-11, E250	Manufacturer's test certificate shall be furnished. UST shall be conducted for12mm &above thick plates per provision of relevant specification before processing the material for manufacturing. Level-ll expert required.
2.0	**Manufacturing Process** a) Over all plan dimension (length & Breadth) b) Thickness of Individual internal layer of elastomer c) Thickness of individual outer layer d) Plan dimension of laminates (length& Breadth)	Dimensional inspection Specified tolerances -2 mm,+4mm ±12 % 0, +2mm -2, +1mm	Visual & Measurement	As per approved drawing	Measurement ofdimension	Manufacturer inspecting agency	At Discretion	Fabricators record.	IRC 83 Part-II & as per drawing	Internal report will be furnished which will be verified by Zonal Railway Inspector. However random check may be done by Zonal Railway inspector during Manufacturing. **Note:** During manufacturing test pieces will also be moulded with identical compound and under identical vulcanizing conditions and suitably marked for identification at the time of tests. This process shall be open to inspection by Railway inspecting official.

S. No.	Component Operation	Characteristic Checks & Tolerances	Frequency & Type of check	Reference Document	Fabricator' s quality control	Inspection details		Type of Records	Acceptance criteria	Remarks
						Inspecting Agency	Extent of Inspection			
1	2	3	4	5	6	7	8	9	10	11
2.0 cont.	e) Thickness of laminate	+0.8,-0.4mm								
	f) Parallelism of laminate with respect to bearing base as datum	1 in 100								
	(g) Hardness during manufacturing	IRHD 60±5	Visual & Measurement	As per approved drawing	Measurement of dimension	Manufacturer inspecting agency	At Discretion	Fabricators record.	IRC 83 Part- II & as per drawing	
	h) Over all Thickness	±2 mm(Tb≤100mm)	Visual and measurement	As per relevant drg. & specification	Measurement Of dimension			Fabricators record & test report.	As per table 2 of IRC 83 Part-II 2018	Bearings to be visually inspected for absence of any defects in surface finish, shape or any other discernible superficial defect. Also after load testing, during visual examination of bearing no defects should be noticed in surface finish, shape or other notice able superficial defects. Authorized inspector may carry out dimensional check for item a) & b) and random check for item c) & d) to be done till full satisfaction.
	i) Parallelism of top surface of bearing with respect to the bottom surface as datum.	1 in 300								
	j) Parallelism of one side surface with respect to the other as datum	1 in 100								

S. No.	Component Operation	Characteristic Checks & Tolerances	Frequency & Type of check	Reference Document	Fabricator's quality control	Inspection details		Type of Records	Acceptance criteria	Remarks
						Inspecting Agency	Extent of Inspection			
1	2	3	4	5	6	7	8	9	10	11
3.0	**Final Inspection on complete bearings** a) Stiffness test 30% to 100% Load.	Test to be conducted as per IRC:83-2018.	All bearing of the lot shall be tested.	As per relevant drg. and specification	Fabricators record.	Consignee	100%	Fabricators record.	IRC:83-2018 Part- II	For both Acceptance Level 1 & Acceptance Level 2, all 100% bearings to be Checked for Stiffness test 30% to 100% load as per Para 7.9.1.1(3), check for misalignment of plates, poor bonding of elastomer and laminated steel plate, surface defect, low stiffness etc. Variation in stiffness of any one bearing shall not be larger than 20% of mean of measured values. **Note:-** For acceptance level l sample from randomly selected bearing of each lot (for destructive testing) of elastomeric bearing as prescribed in procedure of IS: 3400 & IRC:83-2018(Part –II) shall be drawn by authorized inspector and all test mention from (b) to (d) are to be done either in house lab or inGovt./NABL approved lab. C) These tests are in addition to tests conducted on specially moulded test pieces prepared at the time of manufacture of bearings. Note that the bearing selected for test will not be reused in test mention at (d) and destructive test will be done on sample prepared from them. D) For acceptance level 2 Shear Bond test will not be done. In this case randomly selected bearings after test can be used in the bridge.
	b) Compressive Stiffness test	Test to be conducted as per Appendix-3 of IRC:83-2018 (Part-II)	Load testing on Two test bearings.				In case of Small & large lot			
	C)Shear Modulus test	Test to be conducted as per Appendix- 3 of IRC:83-2018 (Part-II) value of G for acceptance from 0.75 MPa to 1.05 MPa	Load testing on Two test bearings.				In case of Small & large lot.			
	D)Shear Bond strength test	Test to be conducted as per Appendix-3 of IRC:83-2018 (Part-II). examination for	Load testing on Two test bearings.				In case of large lot only			

		evidence of cracking/ peeling both in strained and unstrained state.								

Note:- Large lot means if number of bearings are ≥24 & tests for Acceptance level1 to be conducted. Small lot means if numbers of bearings are <24 where Acceptance level 2 tests are done. Lot size to be approved by the engineer. In large lot 2 extra bearings to be made which are consumed in destructive testing.