

STANDARD QUALITY ASSURANCE PLAN FOR EXPANSION JOINTS

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

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
1.0	RAW MATERIAL									
1.1	Mild Steel For Steel Plates, Angles, Splice Plates, Anchor Loops, Studs etc	<p>Mechanical Test UTS, Yield Stress, Elongation%, Bend test , Impact test at 0 degree centigrade or -20 degree for sub-zero zone</p> <p>Chemical Test C, Mn, Si, P, S, CE.</p> <p>Physical condition i.e. Pitting, rusting, rolling defect, etc.</p> <p>Dimensional Check</p> <p>Ultrasonic Testing of plates (100% for 12mm & above thick plates)</p>	<p>As per Mill TC & test required by Authorized inspecting official of Zonal Railway from Govt. Lab ./ NABL approved lab.</p> <p>Length Width Thickness Dia</p>	Mill TC and Challan	<p>1. Verification of reference document.</p> <p>2. Complete visual inspection.</p>	Authorized Inspecting official of Zonal Railway	One test piece per thickness per heat.	Fabricators record Co-related with Mill TC & test report.	<p>IS: 2062-11, E250 ,Quality BO is generally used. However Quality C shall be used for sub zero condition. (As specified in approved Drg.).</p> <p>IS:4225 or ASTM A435</p>	<p>Manufacturer's test certificate shall be furnished. UST shall be conducted for 12mm & above thick plates as per provision of relevant specification before processing the material for manufacturing.</p> <p>Raw Material to be cleared by nominated inspecting official of Zonal Railway:</p>
1.2	Strip Seal and other Elastomer Components (Only virgin Polychloroprene (CR) is permitted & preferable grades are- Neoprene WRT,	<p>Physical Test With values of characteristics specified</p>	As per manufacturer certificate & test required by Authorized inspector of zonal Railway from Govt./ NABL approved	Manufacturer test certificate & Challan	Verification of reference document.	Authorized Inspecting official appointed by Zonal Railway	From batches at Random and at discretion of Inspector	Fabricators record.	IRC:83 (Part-II) & IS:3400 (as per relevant test procedure)	Examination 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

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	Bayprene 110, Skyprene B-5 and Denka S-40V)	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 <u>Chemical Test</u> i) Determination/ Identification of polymer ii) Polymer content iii) Ash content (iv) Specific gravity	lab IRHD (60 ± 5) 17 MPa 400% 35% 100 ± 1° c for 70 Hours +15% w.r.t. value of (a) -15% w.r.t. value of (b) -30% w.r.t. value of (c) Min. 7 KN/m As per manufacturer certificate & test required by Authorized inspector of zonal Railway from Govt./ NABL approved lab min 60% Max 5%			Verification of reference document. Authorized Inspecting official appointed by Zonal Railway -do- -do- -do-	From batches at Random -do- -do- -do-	Fabricator's record. IRC:83 (Part-II) Ash content as per IS:3400 part XXII and Polychloroprene content as per ASTM-D297 Identification of polymer as per ASTM D 3677 (as per relevant test	(v) Compression set (vi) Accelerated Ageing test (vii) Adhesion Strength IMPORTANT: Properties of Elastomer should be as per Table 1 of IRC:83 Part-II Polychloroprene Content ≤ 60 % Ash content ≥ 5% Note: (i) No reclaimed rubber, vulcanized wastes or natural rubber shall be used. (ii) EPDM (Ethylene 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. 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	

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									procedure)	evaluation.
2.0	Welding:									
	a) Submission of WPSS	Review of WPSS	Verification	IRS B1-2001 IS 9595-96 WBC-2001	Verification of Reference Document	RDSO	100%	Fabricator's Record	IRS B1-2001 IS 9595-96 WBC-2001	Only RDSO certified welders to be engaged in the job.
	b) WPQR	Witnessing of established WPSS Witnessing of Welder Qualification test	Visual, DT & NDT at approved lab	As per code requirement	Verification of Reference Document	RDSO	100%	WPQR Sheet to be recorded in presence of RDSO Rep.	IS 7310(I)-74	
	c) Preheating	Measurement of Temperature	Visual with thermal Chalk	As per approved WPSS	Verification of Reference Document	Authorized Inspecting official appointed by Zonal Railway	Random	Inspection Report of Inspection Official & Fabricator's Record	IRS B1-2001	
	d) Baking of Electrode, Flux	To have moisture free Electrode & Flux	Visual Check of Electrodes & beating	As per Manufacturer's recommendations	Verification of Reference Document	Authorized Inspecting official appointed by Zonal Railway	Random	Inspection Report of Inspection Officials & Fabricator's Record	IRS B1-2001	
	e) Selection of correct Electrodes & Flux	Reference to WPSS, IRS Class, etc.	Visual	As per approved WPSS	Verification of Reference Document	Authorized Inspecting official appointed by Zonal Railway	100%	Inspection Report of inspection official & Fabricator's	As per list of vendors approved by RDSO	

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	f) Current Condition	Measurement of Amp. & Voltage	Visual with Ammeter & Voltmeter	As per approved WPSS	Verification of Reference Document	Authorized Inspecting official appointed by Zonal Railway	Random	Inspection Report of Inspection Official & Fabricator's Record	IRS B1-2001	
3	<u>IN Process Inspection</u>	(a) Angle Profile (b) Anchorage (c) Profile (d) Weld check (e) Stud (f) Dimensional Check (g) Straightness check	Size, thickness Dia , profile Size by Gauge, Length, width, thickness As per drawing Size by gauge & DPT Dia & length of stud Length, width, thickness As per drawing By line dori	Concern specification & drawings	Visual & dimensional verification w.r.t. concern specification & drawings	Firm & Authorized Inspecting Official nominated by Zonal Rly	100% by Firm & random by Zonal Rly	Fabrication record maintained by Firm		In Random check Rly supervisor will record their observations on records maintained by Firm
4	<u>Finished expansion joint inspection</u>	(a) Dimensional check (b) Straightness check	Length, width, thickness As per drawing By line dori Size by gauge		Visual & dimensional verification w.r.t. concern specification & drawings	Authorized Inspecting Official of Zonal Rly/RDSO Authorized Inspecting	100% by Zonal Rly/RDSO Minimum 20% by			Quality check list (like sample Annexure-A) as per approved drawing to be maintained by Firm & same to be checked & verified by concern Rly official/RDSO.

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		(c) Welding check- by gauge/DPT	Material Size, length Dia etc.			Official of Zonal Rly/RDSO Authorized Inspecting Official of Zonal Rly/RDSO	Zonal Rly/RDSO 100% by Zonal Rly/RDSO			
5	Painting Process	Verification of Manufacture s Test Certificate Inspection Certificate, Challan	Visual	Verifica tion of Manufa cture s Test Certific ate, Challan	Verification of reference document	Authorized Inspecting Official of Zonal Railway	Each Batch	Fabricato rs record	As per relevant Specification	Paint should be as per IRS: B1:2001 or as per contract conditions as applicable
6	Packing &Dispatch	(a) Marking of expansion joints (b) Clamping of joints (c) packing o f expansion joint			Verification of reference document	Zonal Railway	Each Batch	Fabricato rs record	As per relevant Specification	

- Note:-** 1. If there are any studs in the approved drawing, performa as per BS-115 issued by RDSO may be referred for suitable changes.
2. If there are Bolts & Nuts in the approved drawing, then add Para 1.3 in this QAP as given for Bolts & Nuts in Para 1.7 of QAP of POT-PTFE Bearings (Anex.-XII)

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QUALITY CHECK LIST OF EXPANSION JOINT (SAMPLE)

Date: _____

S.No.	Description	Required	Progress
1.	Size of the Edge Beam Length (+3, -0) mm		
2.	Anchor Studs Should be properly bend		
3.	Straightness Throughtout the Length of the Beam (no bending)		
4.	Proper Attachment of Splicing Plates at the end.		
5.	Proper Welding Size of Anchor Studs. (e.g. 8mm, 45 ⁰)		
6.	Seal Gap (6mm + 0, -1)		
7.	Edge Beam corner should be properly round like Fillet not Chamfer		
8.	Angle Joint Straight with proper "V" Shape		
9.	No Splatter, Primer & Final Paint Application		
10.	Hammer Test		

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