In response to uploaded Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01), on RDSO's Website dated 09.04.2025, reasoned document has been prepared as under:

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
0.0Forward			
1.1 As a part of system improvement in procurement of track items, track items of similar functional requirements and basic material viz. Grooved Rubber Sole plates (GRSP), Composite Grooved Rubber Sole plates (CGRSP) and Nylon Cord Reinforced GRSP are clubbed together into one single item, hereby known as '**Rail Pad**'. In this context following present specifications have been merged in the present specification: **i)** IRS specification for 6mm thick Grooved Rubber Sole Plate, Sl. no. IRS/T-47 ~~**ii)**~~ IRS specification for 10 mm thick Grooved Rubber Pad (Provisional)-1989 **iii)** IRS Specification for 6.2mm Composite Grooved Rubber Sole Plate, no. M&C/RP-198/2006 **iv)** IRS Specification for 10mm Composite Grooved Rubber Sole Plate, no. M&C/RP-200/2007 **v)** IRS Specification for 6mm thick Nylon Cord Reinforced Grooved Rubber Sole Plate, no. M&C/RP-201/2020 (Rev-1)	Nil	No Change proposed	**1.1** As a part of system improvement in procurement of track items, track items of similar functional requirements and basic material viz. Grooved Rubber Sole plates (GRSP), Composite Grooved Rubber Sole plates (CGRSP) and Nylon Cord Reinforced GRSP are clubbed together into one single item, hereby known as '**Rail Pad**'. In this context following present specifications have been merged in the present specification: **i)** IRS specification for 6mm thick Grooved Rubber Sole Plate, Sl. no. IRS/T-47 **ii)** IRS specification for 10 mm thick Grooved Rubber Pad (Provisional)-1989 **iii)** IRS Specification for 6.2mm Composite Grooved Rubber Sole Plate, no. M&C/RP-198/2006 **iv)** IRS Specification for 10mm Composite Grooved Rubber Sole Plate, no. M&C/RP-200/2007 **v)** IRS Specification for 6mm thick Nylon Cord Reinforced Grooved Rubber Sole Plate, no. M&C/RP-201/2020 (Rev-1)
1.2 For the purpose of deciding whether a particular requirement of this standard is complied with the final value observed and calculate expressing the results of a test or analysis, shall require to be rounded off in accordance with IS:2. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard specification.	Nil	No Change proposed	2.0 For the purpose of deciding whether a particular requirement of this standard is complied with the final value observed and calculate expressing the results of a test or analysis, shall require to be rounded off in accordance with IS:2. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard specification.
1.0 Scope			
1.1 This specification covers the requirements, method of	Nil	No Change proposed	1.1 This specification covers the requirements,

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tests, sampling and scheme of testing for Rail Pads for placing beneath rails, at rail seat of the PSC sleepers i.e. Grooved Rubber Sole Plate (6mm & 10mm thick), Composite Grooved Rubber Sole plates (6.2mm & 10mm thick) & Nylon Cord Reinforced GRSP (6mm & 10mm thick).			method of tests, sampling and scheme of testing for Rail Pads for placing beneath rails, at rail seat of the PSC sleepers i.e. Grooved Rubber Sole Plate (6mm & 10mm thick), Composite Grooved Rubber Sole plates (6.2mm & 10mm thick) & Nylon Cord Reinforced GRSP (6mm & 10mm thick).
1.2 All the provisions contained in RDSO's ISO apex documents (latest versions) subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor(s) in the tenders floated by Railways to maintain quality of products supplied to Railways.	Nil	No Change proposed	1.2 All the provisions contained in RDSO's ISO apex documents (latest versions) subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor(s) in the tenders floated by Railways to maintain quality of products supplied to Railways.
2.1The latest versions of BIS specification as follows and the RDSO drawing of the Rail pads under manufacture shall be available at the manufacturer's works premises.	Nil	No Change proposed	2.1 The latest versions of BIS specification as follows and the RDSO drawing of the Rail pads under manufacture shall be available at the manufacturer's works premises.
2.1.1IS: 7503(Part I to IV): Glossary of terms used in Rubber Industry.	Nil	No Change proposed	2.1.1 IS: 7503(Part I to IV): Glossary of terms used in Rubber Industry.
2.1.2IS:3400(Part 1):2021: Methods of test for vulcanized rubbers : Part 1 Tensile stress strain properties (3rd revision).	Nil	No Change proposed	2.1.2 IS:3400(Part 1):2021: Methods of test for vulcanized rubbers : Part 1 Tensile stress strain properties (3rd revision).
2.1.3IS:3400(Part II): 2014(Reaffirmed 2019): Methods of test for vulcanized rubbers : Part II Determination of Hardness	Nil	No Change proposed	2.1.3 IS:3400(Part II): 2014(Reaffirmed 2019): Methods of test for vulcanized rubbers : Part II Determination of Hardness
2.1.4IS:3400(Part IV): 2012(Reaffirmed 2017): Methods of tests for vulcanized rubbers: part IV Accelerated ageing and Heat resistance	Nil	No Change proposed	2.1.4 IS:3400(Part IV): 2012(Reaffirmed 2017): Methods of tests for vulcanized rubbers: part IV Accelerated ageing and Heat resistance
2.1.5IS:3400(Part IX): 2020: – Methods of test for vulcanized rubbers: Part IX Determination of Density	Nil	No Change proposed	2.1.5 IS:3400(Part IX): 2020: – Methods of test for vulcanized rubbers: Part IX Determination of Density
2.1.6IS: 3400(Part X)-1977 (Reaffirmed 2019): Methods of tests for vulcanized rubbers: part X compression set at constant strain (first revision)	Nil	No Change proposed	2.1.6 IS: 3400(Part X)-1977 (Reaffirmed 2019): Methods of tests for vulcanized rubbers: part X compression set at constant strain (first revision)
2.1.7IS: 3400(Part XIII)-1983(Reaffirmed 2019): Methods of tests for vulcanized rubbers: part XIII Tension Set	Nil	No Change proposed	2.1.7 IS: 3400(Part XIII)-1983(Reaffirmed 2019): Methods of tests for vulcanized rubbers: part XIII Tension Set
2.1.8IS: 3400(Part XV)-1971(Reaffirmed 2019): Methods of	Nil	No Change	2.1.8 IS: 3400(Part XV)-1971(Reaffirmed 2019):

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tests for vulcanized rubbers: part XV volume resistivity of electrically conducting and antistatic rubbers.		proposed	Methods of tests for vulcanized rubbers: part XV volume resistivity of electrically conducting and antistatic rubbers.
2.1.9 IS: 3400(Part 22):1984(Reaffirmed 2019) - Methods of test for vulcanized rubber: Part 22 Chemical analysis.	Nil	No Change proposed	2.1.9 IS: 3400(Part 22):1984(Reaffirmed 2019) - Methods of test for vulcanized rubber: Part 22 Chemical analysis.
2.1.10IS: 2-1960(Reaffirmed: 2021): Rules for rounding off numerical values	Nil	No Change proposed	2.1.10 IS: 2-1960(Reaffirmed: 2021): Rules for rounding off numerical values
2.1.11IS: 4905: 2015(Reaffirmed: 2020): Random sampling and Randomization procedure (First revision)	Nil	No Change proposed	2.1.11 IS: 4905: 2015(Reaffirmed: 2020): Random sampling and Randomization procedure (First revision)
2.1.12 ASTM-D-945-Method of test for mechanical properties of Elastomeric vulcanizates under compressive or shear strain by mechanical oscillographs.	Nil	No Change proposed	2.1.12 ASTM-D-945-Method of test for mechanical properties of Elastomeric vulcanizates under compressive or shear strain by mechanical oscillographs.
2.1.13ASTM-D-2138: Method of test for Adhesion between Cord and Rubber (H-Pull test)	Nil	No Change proposed	2.1.13 ASTM-D-2138: Method of test for Adhesion between Cord and Rubber (H-Pull test)
2.1.14 ASTM-E1131− 08: Standard Test Method for Compositional Analysis by Thermogravimetry	**Patil Rail Infrastructure Pvt. Ltd.: OK**	TGI test is added in the specification. Accordingly, the ASTM standard is added.	2.1.14 ASTM-E1131− 08: Standard Test Method for Compositional Analysis by Thermogravimetry
2.1.15 ISO 11358-1: Plastics — Thermogravimetry (TG) of polymers Part-1 General principles	**Patil Rail Infrastructure Pvt. Ltd.: OK**	TGI test is added in the specification. Accordingly, the ISO standard is added.	2.1.15 ISO 11358-1: Plastics — Thermogravimetry (TG) of polymers Part-1 General principles
2.1.16BS-ISO 1431-1-2024: Rubber, vulcanized or thermoplastic — Resistance to ozone cracking, Part 1: Static and dynamic strain testing	**Patil Rail Infrastructure Pvt. Ltd.: OK**	Ozone test is added in the specification. Accordingly, the ISO standard was added. However, IS: 3400 Part-20:2021 contains the testing	2.1.16 IS: 3400 Part-20:2021, Resistance to Ozone Cracking (Static Strain Test)

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		details, hence, reference to this code.	
2.1.17ASTM D5963: (Rubber Property—Abrasion Resistance (Rotary Drum Abrader))	**Patil Rail Infrastructure Pvt.Ltd.:** Or DIN Abrsion tester as per DIN 53516	Rebound Resilience test is added in the specification and hence, IS standard for rebound test is referred. Abrasion test is covered in para 2.1.18.	2.1.17 IS: 3400 Part-11:2021, Rebound Resilience Measures the energy return capability of rubber after deformation.
2.1.18ISO 4649: (Rubber—Determination of resistance to abrasion using a rotating cylindrical drum device)	Nil	Abrasion test is added in the specification. Accordingly, the ISO standard was added. As IS: 3400 Part-3:2021 covers the abrasion test, the same is referred.	2.1.18 IS: 3400 Part-3:2021, Abrasion Resistance Assesses the wear resistance of rubber materials.
-	**Patil Rail Infrastructure Pvt.Ltd.:** ASTM D430 DeMattia Flexing machine to determine rubber deterioration – Dymanic fatigue	In the proposed revision of the specification, durability test for rail pad has been added. Therefore, the suggested Dynamic Fatigue test will not be required.	Not added in the specification
2.2 IS: 7151: 1991(Reaffirmed :2018): Corrugated Fibreboard Boxes for para dropping of supplies.	Nil	No Change proposed	2.2 IS: 7151: 1991(Reaffirmed :2018): Corrugated Fibreboard Boxes for para dropping of supplies.
2.3 The specific provisions in this standard specification over-ride those in the above BIS specifications where these are	**1.M/s Shah Elastomer:** **2.M/s Shiva Industries:**	No Change	2.3 The specific provisions in this standard specification over-ride those in the above

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not in conformity with one another. The specific requirement given in the drawing of the Rail pads will over-ride the relevant provision of this specification.	Over the years BIS specifications are incorporated in various IRS specification and testing methodology is adopted from the same. BIS specification is a standard specification having various provisions which should not be ignored or over-ride as these are followed in several products similar to rail pads. The time frame and percentage variation acceptable on different parameters mentioned in Appendix-R are vague and derived from nowhere having no basis. Whereas in BIS specification the time frame for testing is correctly mentioned for variable and constant parameters and followed since many years. So we suggest that the provisions of BIS should not over-ride with provisions of Appendix-R and Appendix-R should be modified accordingly.	proposed. The provisions of this Specification which are at variance with BIS specifications have been framed considering special requirements of the Railway. Therefore, in case of any non-conformance, the provisions of IRS T-55 shall prevail. Procedure for Picking up samples from the lot already passed by inspecting official/agency in the vendor premises or from consignee end/field is given in the Appendix-R. The provision was made as per the experience and testing conducted on the product.	BIS specifications where these are not in conformity with one another. The specific requirement given in the drawing of the Rail pads will over-ride the relevant provision of this specification
3.0 <u>RAW MATERIAL</u>			

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3.1 The Rail Pad shall be manufactured from virgin base material only i.e. using Natural Rubber, Ribbed Smoked Sheet (RSS) either of grade 1 ~~to 4~~ or 2 or a blend with Styrene Butadiene Rubber (SBR) and/or Poly Butadiene Rubber (PBR). The Rail Pad shall not be manufactured using reclaimed/ re-refined/ recycled/ regenerated rubber.	**1.Adinath Industries**: **2.M/s Parashath Enterprises:** **3. M/s Shiva Industries:** Currently we are using grade RSS 1 to 4 for manufacturing of Rail Pad. We are achieving testing parameters as per relevant clauses 5.1 or 5.2 or 5.3 of specification by using grade 3 or 4 also. Major consumption of natural rubber is RSS-4 even tyre companies use RSS-3 & Rss-4 Hence, there is no need for change of grade from RSS 1-4 to 1 or 2. **4. Ameenji Industries:** Technically there is no much Change in RSS1 or 2 & RSS 3 or 4 of Natural Rubber. And RSS 1 or 2 availability is very less in the market compare to RSS 3 or 4. Majority of available grade is RSS 4 in the market. **5.M/s Shah Elastomer:** To achieve the required properties of the rail pad apart from the polymer, different chemicals, accelerators, antioxidants play a vital role. RSS-4 is widely used as the most common form of natural rubber to manufacture rail pads and in the past properties have been achieved using this grade. Is there any study to prove that by the use of only RSS-1 or 2 grade NR, the required properties can be achieved?. Keeping in view the mass requirement of rail pads the availability of RSS-1 and 2 in the market is very minimal as # compared to RSS-4. This can be verified by Rubber Board. So we suggest that RSS -1 to 4 should be continued to be allowed for	The comments of the firms are acceptable in view of limited availability of RSS1 and RSS2. Therefore, RSS3 has also been included in this para.	3.1 The Rail Pad shall be manufactured from virgin base material only i.e. using Natural Rubber, Ribbed Smoked Sheet (RSS) either of grade RSS1, RSS2 or RSS3 or a blend with Styrene Butadiene Rubber (SBR) and/or Poly Butadiene Rubber (PBR). The Rail Pad shall not be manufactured using reclaimed/ re-refined/ recycled/ regenerated rubber.

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	manufacture of rail pad. **6.M/s Shri Radha Polymers:** As is commonly known RSS 4 grade is the most widely uséd grade of Natural rubber, due to its quality, versatility in compounding and its availability in large quantity. It is used widely in Tyre and Automobile industry. Marketwise the availability due to high production and use of RSS 4 grade is vast and hence removing it from use in Rail Pads is a not technically and commercially viable option. **7. .M/s V K Enterprises :** Use of Natural Rubber RSS-1 or2 is unwarranted and unsubstantiated as no vendor has ever conducted any pilot study to ascertain the impact of use of these grades on the final results. **8.M/s ROYAL FASTENERS NE** The removal of RSS 3 & 4 seems restrictive. Considering major production of Natural Rubber is RSS 4, and even tyre companies use RSS 3 & RSS 4, we suggest re-evaluating this clause to include them. **9.M/s ROYAL ELASTOMERS** RSS 3 & RSS 4 should be retained, as major production is of RSS 4 and it is used by tyre companies **10. Patil Rail Infrastructure Pvt.Ltd.:** The Rail Pad shall be manufactured from virgin base material only i.e.		

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	using Natural Rubber, Ribbed Smoked Sheet (RSS) either of grade 1 to 4 or 2 or a blend with Styrene Butadiene Rubber (SBR) and/or Poly Butadiene Rubber (PBR) **or other special synthetic** rubber . The Rail Pad shall not be manufactured using reclaimed/ re-refined/ recycled/ Page 3 of 35 regenerated rubber.		
3.2 For Rail Pad made of natural rubber with a particular grade of RSS 1 ~~to 4~~ or 2, the manufacturer should have valid license from Rubber Board for procurement of the natural rubber and to be used for manufacturing of Rail pads.	Nil	The Para has been revised as per comments on Para 3.1.	For Rail Pad made of natural rubber with a particular grade of RSS1, RSS2 or RSS3, the manufacturer should have valid license from Rubber Board for procurement of the natural rubber to be used for manufacturing of Rail pads.
3.3 During inspection of Rail pads, the supplier should submit invoice with e-way bill in support of procurement of natural rubber of a particular grade from the sources having valid license from Rubber Board with proof of filing annual return with Rubber Board. Further, invoice of carbon blacks ~~of suitable ASTM grades or~~ as per ASTM D 1765 procured from the primary manufacturing sources or their authorized dealer shall be submitted at the time of ~~RDSO~~ inspection. A record shall be maintained showing procurement & consumption of natural rubber and carbon blacks used for the production of Rail pads.	**1. Patil Rail Infrastructure Pvt.Ltd.:** During inspection of Rail pads, the supplier should submit invoice with e-way bill insupport of procurement of natural rubber of a particular grade from the sources having valid license from Rubber Board with proof of filing annual return with Rubber Board. Further, invoice of carbon blacks ~~of suitable ASTM grades or~~ as per ASTM D 1765 or **Silica (Ultrasil VN3 or equivalent) as per ATSM D 2413** procured from the primary manufacturing sources or their authorized dealer shall be submitted at the time of ~~RDSO~~ inspection. A record shall be maintained showing procurement & consumption of natural rubber and carbon blacks used for the production of Rail pads.	Comments of the firm are accepted. Accordingly Para has been revised.	3.3 During inspection of Rail pads, the supplier should submit invoice with e-way bill in support of procurement of natural rubber of a ~~particular~~ grade RSS1, RSS2 or RSS3 from the sources having valid license from Rubber Board with proof of filing annual return with Rubber Board. Further, invoice of carbon blacks ~~of suitable ASTM grades or~~ as per ASTM D 1765, silica (particle size < 20 microns) procured from the primary manufacturing sources or their authorized dealers shall be submitted at the time of ~~RDSO~~ inspection. A record shall be maintained showing procurement and consumption of natural rubber and carbon blacks used for the production of Rail pads.
3.4 For Nylon Cord Reinforced GRSP, the supplier should submit the purchase invoice along with e-way bill, in support of procurement of nylon cord of style 1260/2 with	Nil	Mismatch of thickness and Denier has been	3.4 For Nylon Cord Reinforced GRSP, the supplier should submit the purchase invoice along with e-way bill, in support of

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minimum 2400 Denier.		corrected by specifying nylon cord of style 1680/2 with minimum 3200 Denier.	procurement of nylon cord of style 1680/2 with minimum 3200 Denier.
4.0 MANUFACTURE			
4.1 Each mix/batch of compound shall be prepared with natural rubber content not less than 55% and subject to their conforming to the requirement as given in relevant clauses 5.1 or 5.2 or 5.3 of this specification	1.**Adinath Industries:** **2.M/s Parashath Enterprises:** As per our ongoing formulation, testing results are meeting with this specification where natural rubber content is less than 55 %. Using natural rubber content more than 55% can affect some testing parameters both GRSP & in compound of CGRSP. Also layer A & layer B has different hardness and to maintain in natural rubber with content more than 55% is not possible. There should be a range of rubber content to be 40-60% to make balance of properties for different compound like A & B When a new Specification design for product comes, lot of exercise needed to develop it by research, designing, formulation, processing & testing etc. We request you to please share the compounding formulation considering that there has been sample testing done at your end before drafting this parameter. **3. M/s Ameenji Industries:** Since we have two types of compound in use for Composite rail Pads, It should be in between 50 to 60% because varied percentage of rubber as per design is required for	The comments of the firm have been examined. The Para has accordingly been modified.	4.1 Each mix/batch of compound shall be prepared with natural Rubber blended with SBR and / or Poly Butadiene Rubber (PBR). In each mix/batch, the polymer content shall not be less than 50% and the product shall conform to the requirements stipulated in relevant clauses 5.1 or 5.2 or 5.3 of this specification.

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	60 to 85 shore A hardness **4 .M/s Bony polymers Pvt.Ltd.** **Comments**: Each mix/Batch of Compound shall be prepared with Blend of Natural and synthetic Rubber content at not less than 55% of polymer and subject to conforming to the requirement as given in relevant clauses 5.1or 5.2 or 5.3 of this specification **Reason** : The groove pad must be composed of a blend of natural rubber and synthetic rubbers such as SBR (StyreneButadiene Rubber), PBR (Polybutadiene Rubber), or other suitable polymers that provide excellent dynamic performance. This aligns with Clause No. 3.1, which allows the compounder reasonable flexibility to use advanced polymers to enhance the compound's overall performance characteristics. **5.M/s Shah Elastomer:** To achieve the required properties of the rail pad apart from the polymer, different chemicals, accelerators, antioxidants play a vital role. The specification covers 6 different rail pads. Is there any specific study to prove that by using more than 55% natural rubber the required properties as elaborated by you on clauses 5.1,5.2 or 5.3 can be achieved?. The specification also permits the blending of natural rubber with other polymers like SBR and PBR. So the percentage of natural rubber cannot be defined until there is a specific study to prove that all the properties		

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	mentioned in these clauses can be achieved by using more than 55% natural rubber. **6. M/s Shiva Industries:** As per our ongoing formulation, testing results are meeting with this specification where natural rubber content is less than 55 %. Using natural rubber content more than 55 % can affect some testing parameters. When a new design product comes, lot of exercise needed to develop it by research, designing, formulation, processing & testing etc. Hence this SN should be omitted. **7.M/s Shri Radha Polymers:** The compound used to make Rail Pads is a mix of different chemicals, polymers, fillers, carbon black, accelerators. The combination used to get the desired properties is a complex jugglery. By setting a minimum % for the use of natural rubber in the formulation will surely affect the achievement of properties as laid in 5.1, 5.2. 5.3. By increasing the polymer content, achieving the Hardness to get Relaxed Modulus will be challenging, since higher the polymer content, the more elastic and soft the end product becomes. Instead a range should be given for example 40-55%, which will ensure proper usage and give cnough margin to get the chemical formulation which achieves the desired test propcrties of Rail Pads. In case RDSO has conducted some trial formulation or testing on this criteria the same may		

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	kindly be shared so as to enable us study the results. **8 .M/s V K Enterprises ::** It is not possible for any vendor to comment on percentage of Natural Rubber at 55% without studying its impact on final results. **9.M/s ROYAL FASTENERS NE** **Manufacturing** mandates a minimum of **55% RSS 1 or 2** per batch. Given the dynamics of **Rubber Compounding**, it is advisable to provide a range, preferably **40- 60**% **rubber content**, to accommodate the varying **hardness** & **physical test requirements**. We request RDSO to **share the compound recipe** since achieving all test results with 55% rubber content appears technically challenging. **10.M/s ROYAL EASTOMERS** Recommend changing the absolute value 55% RSS 1 or 2 requirement to a flexible 40-60% rubber content to meet physical test requirements. Please consider sharing a compound recipe, as it appears difficult to meet all required parameters with the specified rubber content. **11. Patil Rail Infrastructure Pvt.Ltd.:** Each mix/batch of compound shall be prepared with natural rubber content not less than 55% (52%) and subject to their conforming to the requirement as given in relevant clauses 5.1or 5.2 or 5.3 of this specification.		

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~~4.1~~ 4.2 Each mix/batch of compound shall be tested for Relaxed Modulus (before ageing) and electrical resistance (before water immersion) and subject to their conforming to the requirement as given in relevant clauses 5.1or 5.2 or 5.3, the manufacture of Rail pad shall be undertaken from such mix / compound.	Nil	No Change proposed	4.2 Each mix/batch of compound shall be tested for Relaxed Modulus (before ageing) and electrical resistance (before water immersion) and subject to their conforming to the requirement as given in relevant clauses 5.1or 5.2 or 5.3, the manufacture of Rail pad shall be undertaken from such mix / compound.
~~4.2~~ 4.3 The Composite Grooved Rubber Sole plates (CGRSP) shall consist of two layers of different rubber compound A & B conforming to the properties as stipulated in clause 5.2 integrally vulcanized and physically inseparable. The CGRSP thus obtained shall conform to the requirement as given in clause 5.2.	Nil	No Change proposed	4.3 The Composite Grooved Rubber Sole plates (CGRSP) shall consist of two layers of different rubber compound A & B conforming to the properties as stipulated in clause 5.2 integrally vulcanized and physically inseparable. The CGRSP thus obtained shall conform to the requirement as given in clause 5.2.
~~4.3~~ 4.4 The thickness of layer conforming to Compound 'A' and Compound 'B' for 6.2mm & 10mm CGRSP are as under: i) For 6.2mm CGRSP: Thickness of Compound 'A': 3.0mm(approx.) Compound 'B' 3.5mm(approx.) and the thickness of the Composite GRSP: 6.2 +0.5 /-0.0 mm. ii) For 10mm CGRSP: Thickness of Compound 'A': 7±0.5 mm Compound 'B': 3±0.5 mm) and the thickness of the Composite GRSP: 10+0.7 /-0.0 mm.	Nil	No Change proposed	4.4 The thickness of layer conforming to Compound 'A' and Compound 'B' for 6.2mm & 10mm CGRSP are as under: i) For 6.2mm CGRSP: Thickness of Compound 'A': 3.0mm(approx.) Compound 'B' 3.5mm(approx.) and the thickness of the Composite GRSP: 6.2 +0.5 /-0.0 mm. ii) For 10mm CGRSP: Thickness of Compound 'A': 7±0.5 mm
~~4.4~~ 4.5 Nylon Cord Reinforced GRSP shall consist of two layers of same compound of GRSP reinforced in between with two layers of treated Nylon Cord placed cross wise to each other in the regular section and a thin rubber layer between two layers of reinforcement. Care shall be exercised to avoid displacement and exposure of the cords during vulcanization. Nylon Cord shall conform to the requirements of the properties specified in the	**1.M/s Shah Elastomer** For both nylon cord GRSP (6mm & 10mm) the construction should be mentioned clearly and separately, mentioning the number of layers of cord in each GRSP and the thickness of rubber on top and bottom.	Comments of the firm are not accepted. The layer of the cord is already mentioned in this Para. However, thickness of	4.5 Nylon Cord Reinforced GRSP shall consist of two layers of same compound of GRSP reinforced in between with two layers of treated Nylon Cord placed perpendicular to each other in the regular section and a thin rubber layer between the two layers of the reinforcement. Care shall be exercised to avoid displacement and exposure of the cords during vulcanization. Nylon Cord

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standard under clause 5.3.1.		rubber on top and bottom cannot be specified as the product is manufactured by hot molding press.	shall conform to the requirement stipulated in the standard under clause 5.3.1.
~~4.5~~ 4.6 The Rail pads shall conform to the requirements of the properties specified in this specification under relevant clause 5.1 or 5.2 or 5.3 as applicable and 7 & 9.	Nil	No Change proposed	4.6 The Rail pads shall conform to the requirements of the properties specified in this specification under relevant clause 5.1 or 5.2 or 5.3 as applicable and 7 & 9.
5.0 PHYSICAL PROPERTIES OF RAIL PADS:	**1.M/s Shah Elastomer:** These new introduced tests shall not improve the quality of the rail pads as the existing tests covered in the existing specification are sufficient to determine the quality of rail pads. Already the specification has been revised multiple times in the recent past introducing costly testing machines. One of those machines such as Impact Attenuation is used once in 5 years. The introduction of these tests shall unnecessarily increase the cost of capital infrastructure and put financial burden on existing vendors who are mostly MSME's. The whole purpose of Make in India policy shall fail if we are regularly bound to purchase costly testing machines. **2.M/s Shiva Industries:** These new introduced tests shall not improve the quality of the rail pads as the existing tests covered in the existing specification are sufficient to determine the quality of rail pads. Already the specification has been	To control the quality of rubber pad during its service life, and to avoid faster deterioration, the additional testing has been added.	

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	revised multiple times in the recent past introducing costly testing machines. One of those machines such as Impact Attenuation is used once in 5 years. **The RDSO should conduct field trial for a minimum of 8 years in different geographical/atmospheric climate as per ISO:12944-Part 5 on Indian Railway track system for validation. How will it be possible for MSME vendors to survive in competitive environment if the specification is revised in every two years against the stipulated time of 5 years**. On 2nd May 2025, a report released by NITI Aayog titled "Enhancing Competitiveness of MSMEs in India" identifying key challenge and presenting a set of systemic reforms aimed at boosting their competitiveness. It is unfortunate that instead of encouraging and promoting MSME vendors, RDSO is imposing restriction to MSME for elimination. **(iii)** Scope of use in Indian Railway in lieu of 10 mm thick NCGRSP is not clear. If at all required, a separate specification for this item may be framed instead of revision of existing IRS-T-55-2023.		
5.1 PHYSICAL PROPERTIES OF FINISHED 6MM & 10MM THICK GROOVED RUBBER SOLE PLATES			
SN **Property/Test** **Units** **Acceptance value for 6mm thick GRSP** **Acceptance value for 10mm thick GRSP** **Test Method**	1.**Adinath Industries:** **2.M/s Parashath Enterprises:** **3.M/s Shiva Industries:** Duration of ageing changed from 96 hours to 72 hours on T-55-2023 from the previous specification. After running two years of specification,	**i)** For improvement in the rubber pad, the minimum polymer content (50%) is fixed in the rubber pad.	**SN** **Property/Test** **Units** **Acceptance value for 6mm thick GRSP** **Acceptance value for 10mm thick GRSP** **Test Method** **1**

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1 Hardness Shore 'A' 75-85 70-80 Appendix 'A' **2** Tensile Strength Appendix 'B' a) Before ageing Kg/cm^2 120 (min) 120 (min) b)After ageing at 100+ 1ºC for ~~72~~ 96+ 0/-2 hrs Kg/cm^2 100 ~~110~~ (min) 100 ~~110~~ (min) c)Retention after ageing % 80 (min) 70 (min) **3** Elongation at break Appendix 'B' a) Before ageing % 200 (min) 200 (min) b)After ageing at 100±1ºC for ~~72~~ 96 + 0/-2 hrs	ageing period again changed. Again, we have to set our formulation to achieve the parameters as per 5.1, 5.2 and 5.3. Also IS Standard or any standard doesn't recommend for 96 hours ageing. Hence, ageing duration shall remain at 72 hours as per IS standard. **For SN 09 of Table:** **1. Patil Rail Infrastructure Pvt.Ltd.:** Approved value ± 5, Subject to not exceeding 27%(**15%)** **For SN 14 of Table:** 1.**Adinath Industries:** **2.M/s Parashath Enterprises:** The test result should be verified before we determine the test requirement. **3. Ameenji Industries:** Ok, In between 50 to 60% as used two types of compounds in the Composite Rail Pads. And the Avg. Rubber content >55 %. **4. M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** Ok, This test may be incorporated in the Specification subject to the acceptance of a range for the polymer usage as mentioned above in the comments for 4.0/4.1. The acceptance of 55% minimum level of polymer content is not technically possible considering the complexity in achieving the test results of the parameters of Rail Pad. **6. Patil Rail Infrastructure Pvt.Ltd.:**	This test will restrict extra and unwanted addition of filler material in the rubber pad and enhance its service life. **ii)** Ozone test identified the use of Antioxidant and Antiozonant in the rubber pad. These chemicals are used in the rubber pad for protection against weathering. Comment of the firm M/s Ameenji Industries: "No surface cracks should be found when the test condition is "Ozone concentration: 25 pphm, Elongation: 30% stretch, Temperature 40 °C ± 2 °C 24hrs duration" has been examined and found reasonable. Hence, a	Hardness Shore 'A' 75-85 70-80 Appendix 'A' **2** Tensile Strength Appendix 'B' a) Before ageing Kg/cm^2 120 (min) 120 (min) b)After ageing at 100+ 1ºC for ~~72~~ 96+ 0/-2 hrs Kg/cm^2 100 ~~110~~ (min) 100 ~~110~~ (min) c)Retention after ageing % 80 (min) 70 (min) **3** Elongation at break Appendix 'B' a) Before ageing % 200 (min) 200 (min) b)After ageing at 100±1ºC for ~~72~~ 96 + 0/-2 hrs %

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
% 150 ~~160~~ (min.) 150 ~~160~~ (min.) c)Retention after ageing % 65 (min.) 60 (min.) **4** Relaxed Modulus at 100% elongation Appendix 'C' a) Before ageing Kg/cm^2 45-60 50-75 b)Change after ageing at 100±1°C for ~~72~~ 96 + 0/-2 hrs % of actual value +30(max) -10 ±40 **5** Compression set subjected to 50% compression at 100±1ºC for 24+0/-2 hrs % 30(max) 30(max) Appendix 'D' **6** Tension set subjected to 50% stretch at 100±1°C for 24+0/-2 hours % 25(max) 25(max)	Thermogravimetric Analysis (TGA) for Rubber content >55**(52)** **For SN 15 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises:** As this test is for 0.5 million cycles, in this test lot of time consumed for testing of approx. 27 hours for 1 sample Testing. In regular inspection it is not possible to conduct this test for every lot. This is a fastening assembly test of the entire component ie. Rail clip, Liner,rubber pad ,Insert & sleeper any Variation on any component will affect the result of the test Hence ti should not be used to check Rubber Pad. It is a design test of the entire fastening assembly and not to check a particular component. **3. M/s Ameenji Industries:** Since Generally, this test is applicable for Complete set of fastening assembly components including Rail Clip, Liner, Rail Pad, Insert & Sleeper. the test may not be so use full since all other test parameter to check .Rail Pad almost ensures & delivers the required outcome. **4. .M/s Shiva Industries:** As this test is for 0.5 million cycles, in this test lot of time consumed for testing of approx. 27 hours for 1 sample testing. In regular inspection it is not possible to conduct this test for every lot. Hence this tests to be	procedure has been included in Appendix-T. **iii)** Vertical Rebound test and Abrasion test indicate proper curing of the rubber pad. Any reduction in curing time merely to manufacture more pads will be checked by these tests. The Rail pad is subjected to abrasion due to creep between the rail and sleeper. Hence the abrasion test is required. **iv)** Durability Test ascertains the long term performance of the rubber pad. The durability test can be conducted simultaneously with the ageing of the product	150 ~~160~~ (min.) 150 ~~160~~ (min.) c)Retention after ageing % 65 (min.) 60 (min.) **4** Relaxed Modulus at 100% elongation Appendix 'C' a) Before ageing Kg/cm^2 45-60 50-75 b)Change after ageing at 100±1°C for ~~72~~ 96 + 0/-2 hrs % of actual value +30(max) -10 ±40 **5** Compression set subjected to 50% compression at 100±1ºC for 24+0/-2 hrs % 30(max) 30(max) Appendix 'D' **6** Tension set subjected to 50% stretch at 100±1°C for 24+0/-2 hours % 25(max) 25(max)

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Appendix 'E' **7** Load Compression Test mm 0.4-0.6 0.7-1.0 Appendix 'F' **8** Electrical resistance a) Before immersion b) After immersion Mega Ohms 100(min) 100(min) 100(min) 100(min) Appendix 'G' **9** Ash content % Approved value ± 5, Subject to not exceeding 27% Approved value ± 5, Subject to not exceeding 27% IS: 3400 (Part 22) **10** Specific gravity - Approved value ± 0.03, Subject to not exceeding 1.27 Approved value ± 0.03, Subject to not exceeding 1.27 IS:3400 (Part IX) **11** Secant Stiffness Test KN/mm 150-250 100-170 Appendix 'H' **12** Impact Attenuation Test % 30 (min)	omitted. **5.M/s Shri Radha Polymers:** This is a test of the fastening components comprising of the entire components consisting of Elastic Rail Clip, Liner, Rubber Pad, Insert & Sleeper. the results of this test are dependent on the entire set of fittings being used. This test is meant for the durability test of the entire fastening system as a whole and cannot be used to ascertain the quality of Rail Pad. Hence cannot be made applicable for testing quality of rubber pads. **6 .M/s ROYAL FASTENERS NE:** Under Physical Properties, while a certain % of rubber content is acceptable by TGA, parameters like Inclined Repeated Load Test should be considered as design tests for fastening assemblies, not for individual components like rubber pads. **For SN 16 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises:** The test result should be verified before we determine the requirement **3. Ameenji Industries:** Ok, the test results will be verified and will be submitted to fix the test requirement. **4..M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** If this test is added, then at first RDSO	which shall take 04 days. Hence, no additional time will be required for this test. Durability test will be conducted with the assembly. However, before and after test shall be done on the rubber pad. No other components i.e. ERC and Liner will affect the performance of pad **v)** Aging time of 96 hour was applicable in the previous version of the specification. It is experienced that lesser ageing time is not sufficient to ensure proper ageing of the material. Hence, ageing time with the respective values as per previous version of specification has been	Appendix 'E' **7** Load Compression Test mm 0.4-0.6 0.7-1.0 Appendix 'F' **8** Electrical resistance a) Before immersion b) After immersion Mega Ohms 100(min) 100(min) 100(min) 100(min) Appendix 'G' **9** Ash content % Approved value ± 5, Subject to not exceeding 27% Approved value ± 5, Subject to not exceeding 27% IS: 3400 (Part 22) **10** Specific gravity - Approved value ± 0.03, Subject to not exceeding 1.27 Approved value ± 0.03, Subject to not exceeding 1.27 IS:3400 (Part IX) **11** Secant Stiffness Test KN/mm 150-250 100-170 Appendix 'H' **12** Impact Attenuation Test % 30 (min)

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40 (min) Appendix 'I' **13** Weight Test gm Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Appendix ~~'O'~~ 'N' **14** Thermogravimetric Analysis (TGA) for Polymer content % >55 >50 ASTM-E1131− 08 **15** Inclined Repeated Load Test (Durability Test) 0.5 million cycle 0.5 million ycle Appendix 'K' **16** Resilience by Vertical Rebound % Will be fixed after sample test Will be fixed after sample test ASTM D-2632/ Appendix 'L' **17** Ozone tes No cracks No cracks BS-ISO 1431-1-2024 **18** Abrasion Test % Volume reduced not more than 20% Volume reduced not more than 20% ASTM D5963 or ISO 4649 **Note:**	should provide data or test results on the basis of which this test is being considered for addition of the specification, and only after due consideration of the above the test may or may not be added. **For SN 17 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises:** As per the test method BS ISO 1431-1-2024, Sample thickness is 2.0 mm ±0.2 mm. But our product thickness is more than this. So, this test is not applicable for it. Also, ozone test is recommended for other rubber like Nitrile, EPDM, Fluor carbon etc. Natural rubber product is not applicable for it. **3. Ameenji Industries:** Ok, No surface cracks should be found when the test condition is "Ozone concentration: 25pphm Elongation: 30%strech, Temperature 40 °C ± 2 °C 24hrs duration". **4. .M/s Shiva Industries:** As per the test method BS ISO 1431-1-2024, Sample thickness is 2.0 mm ±0.2 mm. But our product thickness is more than this. So, this test is not applicable for it. Also, ozone test is recommended for other rubber like Nitrile, EPDM, Fluro carbon etc. Natural rubber product is not applicable for it. Hence, this test may be omitted. **5.M/s Shri Radha Polymers:** Considering the fact that the rail pads are being used since past so many	restored.	40 (min) Appendix 'I' **13** Weight Test gm Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Appendix ~~'O'~~ 'N' **14** Thermogravimetric Analysis (TGA) for Polymer content % >50 >50 ASTM-E1131− 08 **15** Inclined Repeated Load Test (Durability Test) 0.5 million cycle 0.5 million ycle Appendix 'K' **16** Resilience by Vertical Rebound % Will be fixed after sample test Will be fixed after sample test ~~ASTM D-2632/~~ Appendix 'L' IS:3400-11 **17** Ozone tes No cracks No cracks ~~BS-ISO 1431-1-2024~~ IS:3400-20 **18** Abrasion Test % Volume reduced not more than 20% Volume reduced not more than 20% ~~ASTM D5963 or~~ ~~ISO 4649~~

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i) Impact Attenuation test shall be conducted on both type of product at RDSO during initial approval. ii) Impact Attenuation test shall be conducted on both type of product at RDSO or firm's lab or independent lab during quality audit of firms by RDSO. iii) **Test for 6mm GRSP**: All the tests shall be carried out on 6 mm thick finished pad. iv) **Test for 10mm GRSP**: All the tests shall be carried out on 10mm thick finished pad.	years and the ageing tests aircady being performed on the pads, this test is not required to be added. The addition of this test will only add financial burden on the company with no actual contribution towards enhancing the quality of life of rubber pads. **6. M/s ROYAL FASTENERS NE:** The Ozone Test should be limited to type tests conducted at NABL accredited labs, not part of regular testing. **M/s Royal Elastomers :** Ozone Test should be a type test conducted at NABL labs, not a routine one. **For SN 18 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises:** As per draft specification one sample to be tested for 0.2 million cycles which is required lots of time to test where 25- 40 lots of material are inspected every month in almost every company. Since the Rail Pad is in static mode beneath rail hence abrasion test is not required. **3. Ameenji Industries:** Ok. The Volume loss shall not more than 20%. **4. M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** Abrasion Test is widely applicable to rubber products which have dynamic loading or application involving motion.		IS:3400-3 **Note:** i) Impact Attenuation test shall be conducted on both type of product at RDSO during initial approval. ii) Impact Attenuation test shall be conducted on both type of product at RDSO or firm's lab or independent lab during quality audit of firms by RDSO. iii) **Test for 6mm GRSP**: All the tests shall be carried out on 6 mm thick finished pad. iv) **Test for 10mm GRSP**: All the tests shall be carried out on 10mm thick finished pad.

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	Since Rail Pads are under static load, the applicability of this test for Rail Pads is of no use, hence should not be considered. **6. M/s ROYAL FASTENERS NE:** The proposed Abrasion Test may not be essential given that Rail Pads remain static beneath the rails. **7. M/s Royal Elastomers :** Abrasion Test may be omitted, given the static application of the rail pads. **New Property Added at SN 18** **1. Patil Rail Infrastructure Pvt.Ltd.:** Flex Property Test-No Crack-ASTMD430		
5.2 **PHYSICAL PROPERTIES OF FINISHED 6.2MM & 10MM THICK COMPOSITE GROOVED RUBBER SOLE PLATE**			
S.N. **Property/ Test** **Units** **Acceptance Value for 6.2mm thick Composite GRSP** **Acceptance Value for 10mm thick Composite GRSP** **Test Method** **1.** Hardness Shore 'A' Harder side (Compound 'A')75-85 & Softer side (Compound 'B') 60-70 Harder side (Compound 'A') 75-85 & Softer side (Compound 'B') 60-70 Appendix 'A' **2.** Tensile Strength	**1.Adinath Industries:** **2.M/s Parashath Enterprises** **3. M/s Shiva Industries:** Duration of ageing changed from 96 hours to 72 hours on T-55-2023 from the previous specification. After running two years of specification, ageing period again changed. Again, we have to set our formulation to achieve the parameters as per 5.1,5.2 and 5.3. Also IS Standard or any standard doesn't recommend for 96 hours ageing. Hence, ageing duration shall remain at 72 hours as per IS standard . **4.V K Enterprises:** The ageing hours has been increased from 72 to 96 hours without changing	**i)** For improvement in the rubber pad, the minimum polymer content (50%) is fixed in the rubber pad. This test will restrict extra and unwanted addition of filler material in the rubber pad and enhance its service life. **ii)** Ozone test identified the use of	**S.N.** **Property/ Test** **Units** **Acceptance Value for 6.2mm thick Composite GRSP** **Acceptance Value for 10mm thick Composite GRSP** **Test Method** **1.** Hardness Shore 'A' Harder side (Compound 'A')75-85 & Softer side (Compound 'B') 60-70 Harder side (Compound 'A') 75-85 & Softer side (Compound 'B') 60-70 Appendix 'A' **2.** Tensile Strength

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Appendix 'B' a)Before ageing Kg/cm^2 120(min) 125(min) b)After ageing at 100±1°C for ~~72~~ 96 + 0/-2 hrs Kg/cm^2 100(min) 110 (min) c)Retention after ageing % 80(min) 80(min) **3.** Elongation at break Appendix 'B' a)Before ageing % 250(min) 250(min) b)After ageing at100±1°C for ~~72~~ 96 +0/-2 hrs % 180(min) 180(min) c)Retention after ageing % 60(min)	values of After Ageing properties. This is completely arbitrary and unfounded. **For SN 15 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** The test result should be verified before we determine the test requirement. **3. Ameenji Industries:** Ok, In between 50 to 60% as used two types of compounds in the Composite Rail Pads. And the Avg. Rubber content >55 %. **4. M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** Ok, This test may be incorporated in the Specification subject to the acceptance of a range for the polymer usage as mentioned above in the comments for 4.0/4.1. The acceptance of 55% minimum level of polymer content is not technically possible considering the complexity in achieving the test results of the parameters of Rail Pad. **6.M/s Shakti Industries:** If TGA increase to 55 than Hardness & Relax Modulus will not meet the required spec value. (Value should be greater than 45.) **For SN 16 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** As this test is for 0.5 million cycles, in this test lot of time consumed for testing of approx. 27 hours for 1	Antioxidant and Antiozonant in the rubber pad. These chemicals are used in the rubber pad for protection against weathering. Comment of the firm M/s Ameenji Industries: "No surface cracks should be found when the test condition is "Ozone concentration: 25 pphm, Elongation: 30% stretch, Temperature 40 °C ± 2 °C 24hrs duration" has been examined and found reasonable. Hence, a procedure has been included in Appendix-T. **iii)** Vertical Rebound test and Abrasion test indicate proper curing of the rubber pad.	Appendix 'B' a)Before ageing Kg/cm^2 120(min) 125(min) b)After ageing at 100±1°C for ~~72~~ 96 + 0/-2 hrs Kg/cm^2 100(min) 110 (min) c)Retention after ageing % 80(min) 80(min) **3.** Elongation at break Appendix 'B' a)Before ageing % 250(min) 250(min) b)After ageing at100±1°C for ~~72~~ 96 +0/-2 hrs % 180(min) 180(min) c)Retention after ageing %

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60(min) **4.** Relaxed Modulus at 100% elongation Appendix 'C' a)Before ageing Kg/cm^2 25-45 25-45 b)Change after ageing at 100±1°C for ~~72~~ 96 + 0/-2 hours % of actual value +30 -10 +30 -10 **5.** Compression set subjected to 50% compression at 100±1°C for 24+0/-2 hours % 30(max) 30(max) Appendix 'D' **6.** Tension set subjected to 50% stretch at 100±1°C for 24+0/-2 hours % 25(max) 25(max) Appendix 'E' **7.** Load Compression Test, min mm 0.6-0.9 0.9-1.2 Appendix 'F'	sample Testing. In regular inspection it is not possible to conduct this test for every lot. This is a fastening assembly test of the entire component ie. Rail clip, Liner, rubber pad ,Insert & sleeper any Variation on any component will affect the result of the test Hence ti should not be used to check Rubber Pad. It is a design test of the entire fastening assembly and not to check a particular component. **3. Ameenji Industries:** Since Generally, this test is applicable for Complete set of fastening assembly components including Rail Clip, Liner, Rail Pad, Insert & Sleeper. the test may not be so use full since all other test parameter to check .Rail Pad almost ensures & delivers the required outcome. **4. .M/s Shiva Industries:** As this test is for 0.5 million cycles, in this test lot of time consumed for testing of approx. 27 hours for 1 sample testing. In regular inspection it is not possible to conduct this test for every lot. Hence this test to be omitted. **5.M/s Shri Radha Polymers:** This is a test of the fastening components comprising of the entire components consisting of Elastic Rail Clip, Liner, Rubber Pad, Insert & Sleeper. the results of this test are dependent on the entire set of fittings being used. This test is meant for the durability test of the entire fastening system as a whole and cannot be used to ascertain the quality of Rail Pad.	Any reduction in curing time merely to manufacture more pads will be checked by these tests. The Rail pad is subjected to abrasion due to creep between the rail and sleeper. Hence the abrasion test is required. **iv)** Durability Test ascertains the long term performance of the rubber pad. The durability test can be conducted simultaneously with the ageing of the product which shall take 04 days. Hence, no additional time will be required for this test. Durability test will be conducted with the assembly. However, before	60(min) 60(min) **4.** Relaxed Modulus at 100% elongation Appendix 'C' a)Before ageing Kg/cm^2 25-45 25-45 b)Change after ageing at 100±1°C for ~~72~~ 96 + 0/-2 hours % of actual value +30 -10 +30 -10 **5.** Compression set subjected to 50% compression at 100±1°C for 24+0/-2 hours % 30(max) 30(max) Appendix 'D' **6.** Tension set subjected to 50% stretch at 100±1°C for 24+0/-2 hours % 25(max) 25(max) Appendix 'E' **7.** Load Compression Test, min mm

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
8. Electrical resistance Appendix 'G' **a)** Before immersion Mega Ohms 100(min) 100(min) **b)** After immersion Mega Ohms 100(min) 100(min) **9.** Ash content - Approved value ± 5, For Compound 'A' 27% (Max) For Compound 'B' 20% (Max) Approved value ± 5, For Compound 'A' 27% (Max) For Compound 'B' 20% (Max) IS: 3400 (Part 22) **10.** Specific gravity % Approved value ± 0.03, For Compound 'A' 1.27 (max) For Compound 'B' 1.17 (Max) Approved value ± 0.03, For Compound 'A' 1.27 (max) For Compound 'B' 1.17 (Max) IS:3400 (Part IX) **11.** Secant Stiffness KN/mm 100-240 100-170 Appendix 'H'	Hence cannot be made applicable for testing quality of rubber pads. **6. .M/s V K Enterprises :** The value of the Durability test has been fixed at 0.5 million cycles without conducting any actual study on the product. **For SN 17 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** The test result should be verified before we determine the requirement. **3. Ameenji Industries:** Ok, the test results will be verified and will be submitted to fix the test requirement. **4. .M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** If this test is added, then at first RDSO should provide data or test results on the basis of which this test is being considered for addition of the specification, and only after due consideration of the above the test may or may not be added. **6.M/s V K Enterprises :** We understand that this test is meant for testing of track fittings as a whole rather than just Rail pad. **For SN 18 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** As per the test method BS ISO 1431-1-2024, Sample thickness is 2.0 mm ±0.2 mm. But our product thickness is	and after test shall be done on the rubber pad. No other components i.e. ERC and Liner will affect the performance of pad **v)** Aging time of 96 hour was applicable in the previous version of the specification. It is experienced that lesser ageing time is not sufficient to ensure proper ageing of the material. Hence, ageing time with the respective values as per previous version of specification has been restored.	0.6-0.9 0.9-1.2 Appendix 'F' **8.** Electrical resistance Appendix 'G' **c)** Before immersion Mega Ohms 100(min) 100(min) **d)** After immersion Mega Ohms 100(min) 100(min) **9.** Ash content - Approved value ± 5, For Compound 'A' 27% (Max) For Compound 'B' 20% (Max) Approved value ± 5, For Compound 'A' 27% (Max) For Compound 'B' 20% (Max) IS: 3400 (Part 22) **10.** Specific gravity % Approved value ± 0.03, For Compound 'A' 1.27 (max) For Compound 'B' 1.17 (Max) Approved value ± 0.03, For Compound 'A' 1.27 (max) For Compound 'B' 1.17 (Max) IS:3400 (Part IX) **11.** Secant Stiffness KN/mm

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
12. Impact Attenuation % 30(min) 40(min) Appendix 'I' **13.** Adhesion Kgf 8(min) 8(min) Appendix 'J' **14.** Weight Test gm Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Appendix ~~'O'~~ 'N' **15** Thermogravimetric Analysis (TGA) for Polymer content % >55 >50 ASTM-E1131− 08 **16** Inclined Repeated Load Test (Durability Test) 0.5 million cycle 0.5 million cycle Appendix 'K' **17** Resilience by Vertical Rebound % Will be fixed after sample test Will be fixed after sample test ASTM D-2632/ Appendix 'L' **18** Ozone tes No cracks No cracks	more than this. So, this test is not applicable for it. Also, ozone test is recommended for otherrubber like Nitrile, EPDM, Fluor carbon etc. Natural rubber product is not applicable for it. **3. Ameenji Industries:** Ok, No surface cracks should be found when the test condition is "Ozone concentration: 25pphm Elongation: 30%strech, Temperature 40 °C ± 2 °C 24hrs duration". **4 .M/s Shiva Industries:** As per the test method BS ISO 1431-1-2024, Sample thickness is 2.0 mm ±0.2 mm. But our product thickness is more than this. So, this test is not applicable for it. Also, ozone test is recommended for other rubber like Nitrile, EPDM, Fluro carbon etc. Natural rubber product is not applicable for it. Hence, this test may be omitted. **5.M/s Shakti Industries:** Natural rubber not suitable for ozone resistance. (Not Recommended). **6.M/s Shri Radha Polymers:** Considering the fact that the rail pads are being used since past so many years and the ageing tests aircady being performed on the pads, this test is not required to be added. The addition of this test will only add financial burden on the company with no actual contribution towards enhancing the quality of life of rubber pads.		100-240 100-170 Appendix 'H' **12.** Impact Attenuation % 30(min) 40(min) Appendix 'I' **13.** Adhesion Kgf 8(min) 8(min) Appendix 'J' **14.** Weight Test gm Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Should not exceed Max weight given in Appendix ~~'N'~~ 'M' Appendix ~~'O'~~ 'N' **15** Thermogravimetric Analysis (TGA) for Polymer content % >50 >50 ASTM-E1131− 08 **16** Inclined Repeated Load Test (Durability Test) 0.5 million cycle 0.5 million cycle Appendix 'K' **17** Resilience by Vertical Rebound % Will be fixed after sample test Will be fixed after sample test ~~ASTM D-2632/~~

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
BS ISO 1431-1-2024 **19** Abrasion Test % Volume reduced not more than 20% Volume reduced not more than 20% ASTM D5963 or ISO 4649 Note: i) Impact Attenuation test shall be conducted on both type of product at RDSO during initial approval. ii) Impact Attenuation test shall be conducted on both type of product at RDSO or firm's lab or independent lab during quality audit of firms by RDSO. iii) **Test for 6.2 mm CGRSP**: All the tests shall be carried out on 6.2 mm thick finished pad. iv)**Test for 10mm Composite GRSP:** All the tests shall be carried out on 10 mm thick finished pad.	**7.M/s V K Enterprises :** The Ozone test may be conducted at any NABL accredited lab or at RDSO M&C lab at regular interval rather than at every inspection batch. **8. M/s Royal Elastomers :** Ozone Test should be a type test conducted at NABL labs, not a routine one. **For SN 19 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** As per draft specification one sample to be tested for 0.2 million cycles which is required lots of time to test where 25- 40 lots of material are inspected every month in almost every company. Since the rail pads is in static mode beneath rail hence abrasion test is not required. **3. M/s Ameenji Industries:** Ok. The Volume loss shall not more than 20%. **4. M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** Abrasion Test is widely applicable to rubber products which have dynamic loading or application involving motion. Since Rail Pads are under static load, the applicability of this test for Rail Pads is of no use, hence should not be considered. **M/s Royal Elastomers :** Abrasion Test may be omitted, given the static application of the rail pads. **New Property Added**		Appendix 'L' IS:3400-11 **18** Ozone tes No cracks No cracks ~~BS ISO 1431-1-2024~~ IS:3400-20 **19** Abrasion Test % Volume reduced not more than 20% Volume reduced not more than 20% ~~ASTM D5963 or~~ ~~ISO 4649~~ IS:3400-3 Note: i) Impact Attenuation test shall be conducted on both type of product at RDSO during initial approval. ii) Impact Attenuation test shall be conducted on both type of product at RDSO or firm's lab or independent lab during quality audit of firms by RDSO. iii) **Test for 6.2 mm CGRSP**: All the tests shall be carried out on 6.2 mm thick finished pad. iv)Test **for 10mm Composite GRSP:** All the tests shall be carried out on 10 mm thick finished pad.

<table>
<tr><th>Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)</th><th>Comments of Stake holders</th><th>RDSO's Remarks</th><th>Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)</th></tr>
<tr><td></td><td>1. Patil Rail Infrastructure Pvt.Ltd.:
Flex Property Test-Cycle-0.3million cycle- 0.3million cycle -ASTMD430</td><td></td><td></td></tr>
<tr><td>5.2.1 For tests on Specific Gravity and Ash Content for compound A & B shall be carried out from the finished pad.</td><td>Nil</td><td>No Change proposed</td><td>5.2.1 For tests on Specific Gravity and Ash Content for compound A & B shall be carried out from the finished pad.</td></tr>
<tr><td>5.2.1 For tests on Specific Gravity and Ash Content for compound A & B shall be carried out from the finished pad.</td><td>Nil</td><td>No Change proposed</td><td>5.2.1 For tests on Specific Gravity and Ash Content for compound A & B shall be carried out from the finished pad.</td></tr>
<tr><td>5.2.3 <u>DYNAMIC PROPERTIES FOR COMPOSITE GRSP</u>

5.2.3.1 The tests as laid down in the clause shall be applicable for compound B for the purpose of product approval or approval of manufacturer and they shall, however, be repeated at specified interval by the approving / inspecting / purchasing authorities at their discretion. This method of tests shall be as per ASTM-D-945.

<table><tr><th>SN</th><th>Properties</th><th>Values</th></tr><tr><td>1.</td><td>Resilience at 20% deformation, min.</td><td>80</td></tr><tr><td>2.</td><td>Static modulus (kg/sqcm) at 20% deformation</td><td>55-65</td></tr><tr><td>3.</td><td>Effective dynamic modulus (kg/sqcm) at
20% deformation</td><td>70-90</td></tr><tr><td>4.</td><td>Oscillating decay, min.</td><td>0.35</td></tr></table></td><td>Nil</td><td>No Change proposed</td><td>5.2.3 <u>DYNAMIC PROPERTIES FOR COMPOSITE GRSP</u>

5.2.3.1 The tests as laid down in the clause shall be applicable for compound B for the purpose of product approval or approval of manufacturer and they shall, however, be repeated at specified interval by the approving / inspecting / purchasing authorities at their discretion. This method of tests shall be as per ASTM-D-945.

<table><tr><th>SN</th><th>Properties</th><th>Values</th></tr><tr><td>1.</td><td>Resilience at 20% deformation, min.</td><td>80</td></tr><tr><td>2.</td><td>Static modulus (kg/sqcm) at 20% deformation</td><td>55-65</td></tr><tr><td>3.</td><td>Effective dynamic modulus (kg/sqcm) at
20% deformation</td><td>70-90</td></tr><tr><td>4.</td><td>Oscillating decay, min.</td><td>0.35</td></tr></table></td></tr>
<tr><td>5.2.3.2 Before testing the Dynamic properties of compound B, tests of Hardness, Ash Content and Specific gravity should be done and should conform to values mentioned in Clause 5.2</td><td>Nil</td><td>No Change proposed</td><td>5.2.3.2 Before testing the Dynamic properties of compound B, tests of Hardness, Ash Content and Specific gravity should be done and should conform to values mentioned in Clause 5.2</td></tr>
<tr><td>5.2.3.3 Dynamic Properties Test shall be conducted for compound B on both types of Composite GRSP at</td><td>Nil</td><td>No Change</td><td>5.2.3.3 Dynamic Properties Test shall be conducted for compound B on both</td></tr>
</table>

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
RDSO during initial approval and / or at firm's premises during quality audit of firms by RDSO		proposed	types of Composite GRSP at RDSO during initial approval and / or at firm's premises during quality audit of firms by RDSO
5.3 **PHYSICAL PROPERTIES OF FINISHED ~~6MM THICK~~ NYLON CORD REINFORCED GROOVED RUBBER SOLE PLATES**			
SN **Property/Test** **Units** **Acceptance value for 6mm thick Nylon Cord Reinforced GRSP** Acceptance value for 10 mm thick Nylon Cord Reinforced GRSP Test Method 1. Hardness Shore 'A' 75-85 75-85 Appendix 'A' 2. Tensile Strength Appendix 'B' 3. a) Before ageing Kg/cm^2 120 (min) 120 (min) 4. b)After ageing at 100±1°C for ~~72~~ 96 + 0/-2 hours Kg/cm^2 100 (min) 100 (min) 5. c)Retention after ageing % 80 (min) 80 (min) 6. Elongation at break	1.**Adinath Industries:** **2.M/s Parashath Enterprises** **3. M/s Shiva Industries:** Duration of ageing changed from 96 hours to 72 hours on T-55-2023 from the previous specification. After running two years of specification, ageing period again changed. Again, we have to set our formulation to achieve the parameters as per 5.1,5.2 and 5.3. Also IS Standard or any standard doesn't recommend for 96 hours ageing. Hence, ageing duration shall remain at 72 hours as per IS standard. **For SN 09 of Table:** **Patil Rail Infrastructure Pvt.Ltd.:** Approved value ± 5, Subject to not exceeding 27% **(15%)** **For SN 11 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** The test result should be verified before we determine the test requirement. **3. Ameenji Industries:** Ok, In between 50 to 60% as used two types of compounds in the Composite Rail Pads. And the Avg. Rubber content >55 %. **4. M/s Shiva Industries:**	**i)** For improvement in the rubber pad, the minimum polymer content (50%) is fixed in the rubber pad. This test will restrict extra and unwanted addition of filler material in the rubber pad and enhance its service life. **ii)** Ozone test identified the use of Antioxidant and Antiozonant in the rubber pad. These chemicals are used in the rubber pad for protection against weathering. Comment of the firm M/s Ameenji Industries: "No surface cracks	**SN** **Property/Test** **Units** **Acceptance value for 6mm thick Nylon Cord Reinforced GRSP** Acceptance value for 10 mm thick Nylon Cord Reinforced GRSP Test Method 1. Hardness Shore 'A' 75-85 75-85 Appendix 'A' 2. Tensile Strength Appendix 'B' 3. a) Before ageing Kg/cm^2 120 (min) 120 (min) 4. b)After ageing at 100±1°C for ~~72~~ 96 + 0/-2 hours Kg/cm^2 100 (min) 100 (min) 5. c)Retention after ageing % 80 (min) 80 (min)

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
Appendix 'B' 7. a) Before ageing % 200 (min) 200 (min) 8. b)After ageing at 100±1°C for ~~72~~ 96 + 0/-2 hours % 150 (min.) 150 (min.) 9. c)Retention after ageing % 65 (min.) 65 (min.) 10. Relaxed Modulus at 100% elongation Appendix 'C' 11. a) Before ageing Kg/cm^2 45-60 45-60 12. b)Change after ageing at 100±1°C ~~72~~ 96 + 0/-2 hours % of actual value +30(max) -10 +30(max) -10	**5.M/s Shri Radha Polymers** Ok,This test may be incorporated in the Specification subject to the acceptance of a range for the polymer usage as mentioned above in the comments for 4.0/4.1. The acceptance of 55% minimum level of polymer content is not technically possible considering the complexity in achieving the test results of the parameters of Rail Pad. **6. Patil Rail Infrastructure Pvt.Ltd.:** Thermogravimetric Analysis (TGA) for Rubber content >55 **(52)** **For SN 12 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** As this test is for 0.5 million cycles, in this test lot of time consumed for testing of approx. 27 hours for 1 sample Testing. In regular inspection it is not possible to conduct this test for every lot. This is a fastening assembly test of the entire component ie. Rail clip, Liner,rubber pad ,Insert & sleeper any Variation on any component will affect the result of the test Hence ti should not be used to check Rubber Pad. It is a design test of the entire fastening assembly and not to check a particular component. **3. Ameenji Industries:** Since Generally, this test is applicable for Complete set of fastening assembly components including Rail Clip, Liner, Rail Pad, Insert & Sleeper. the test may not be so use full since all other test parameter to check Rail	should be found when the test condition is "Ozone concentration: 25 pphm, Elongation: 30% stretch, Temperature 40 °C ± 2 °C 24hrs duration" has been examined and found reasonable. Hence, a procedure has been included in Appendix-T. **iii)** Vertical Rebound test and Abrasion test indicate proper curing of the rubber pad. Any reduction in curing time merely to manufacture more pads will be checked by these tests. The Rail pad is subjected to abrasion due to creep between the rail and sleeper. Hence the abrasion test	6. Elongation at break Appendix 'B' 7. a) Before ageing % 200 (min) 200 (min) 8. b)After ageing at 100±1°C for ~~72~~ 96 + 0/-2 hours % 150 (min.) 150 (min.) 9. c)Retention after ageing % 65 (min.) 65 (min.) 10. Relaxed Modulus at 100% elongation Appendix 'C' 11. a) Before ageing Kg/cm^2 45-60 45-60 12. b)Change after ageing at 100±1°C ~~72~~ 96 + 0/-2 hours % of actual value +30(max) -10

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
13. Compression set subjected to 50% compression at 100±1°C for 24+0/-2 hours % 30(max) 30(max) Appendix 'D' 14. Tension set subjected to 50% stretch at 100±1°C for 24+0/-2 hours % 25(max) 25(max) Appendix 'E' 15. Load Compression Test mm 0.3-0.5 0.5-0.8 Appendix 'F' 16. Electrical resistance Appendix 'G' 17. a) Before immersion Mega Ohms 100(min) 100(min) 18. b) After immersion Mega Ohms 100(min) 100(min) 19. Ash content %	Pad almost ensures & delivers the required outcome. **4.M/s Shiva Industries:** As this test is for 0.5 million cycles, in this test lot of time consumed for testing of approx. 27 hours for 1 sample testing. In regular inspection it is not possible to conduct this test for every lot. Hence this test to be omitted. **5.M/s Shri Radha Polymers:** This is a test of the fastening components comprising of the entire components consisting of Elastic Rail Clip, Liner, Rubber Pad, Insert & Sleeper. the results of this test are dependent on the entire set of fittings being used. This test is meant for the durability test of the entire fastening system as a whole and cannot be used to ascertain the quality of Rail Pad. Hence cannot be made applicable for testing quality of rubber pads. **For SN 13 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** The test result should be verified before we determine the requirement **3. Ameenji Industries:** Ok, the test results will be verified and will be submitted to fix the test requirement. **4.M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** If this test is added, then at first RDSO should provide data or test results on the basis of which this test is being	is required. **iv)** Durability Test ascertains the long term performance of the rubber pad. The durability test can be conducted simultaneously with the ageing of the product which shall take 04 days. Hence, no additional time will be required for this test. Durability test will be conducted with the assembly. However, before and after test shall be done on the rubber pad. No other components i.e. ERC and Liner will affect the performance of pad **v)** Aging time of 96 hour was applicable in the previous version of the	+30(max) -10 13. Compression set subjected to 50% compression at 100±1°C for 24+0/-2 hours % 30(max) 30(max) Appendix 'D' 14. Tension set subjected to 50% stretch at 100±1°C for 24+0/-2 hours % 25(max) 25(max) Appendix 'E' 15. Load Compression Test mm 0.3-0.5 0.5-0.8 Appendix 'F' 16. Electrical resistance Appendix 'G' 17. c) Before immersion Mega Ohms 100(min) 100(min) 18. d) After immersion Mega Ohms 100(min) 100(min)

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
Approved value + 5 Subject to not exceeding 27% Approved value ± 5 Subject to not exceeding 27% IS: 3400 (Part 22) 20. Specific gravity - Approved value + 0.03, Subject to not exceeding 1.27 Approved value + 0.03, Subject to not exceeding 1.27 IS:3400 (Part IX) **11** Thermogravimetric Analysis (TGA) for Polymercontent % >55 >50 AS M-E1131− 08 **12** Inclined Repeated Load Test (Durability Test) 0.5 million cycle 0.5 million cycle Appendix 'K' **13** Resilience by Vertical Rebound % Will be fixed after sample test Will be fixed after sample test ASTM D-2632/ Appendix 'L' **14** Ozone test No cracks No cracks BS ISO 1431-1-2024 **15**	considered for addition of the specification, and only after due consideration of the above the test may or may not be added. **For SN 14 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** As per the test method BS ISO 1431-1-2024, Sample thickness is 2.0 mm ±0.2 mm. But our product thickness is more than this. So, this test is not applicable for it. Also, ozone test is recommended for other rubber like Nitrile, EPDM, Fluor carbon etc. Natural rubber product is not applicable for it. **3. Ameenji Industries:** Ok, No surface cracks should be found when the test condition is "Ozone concentration: 25pphm Elongation: 30%strech, Temperature 40 °C ± 2 °C 24hrs duration". **4 .M/s Shiva Industries:** As per the test method BS ISO 1431-1-2024, Sample thickness is 2.0 mm ±0.2 mm. But our product thickness is more than this. So, this test is not applicable for it. Also, ozone test is recommended for other rubber like Nitrile, EPDM, Fluro carbon etc. Natural rubber product is not applicable for it. Hence, this test may be omitted. **5.M/s Shri Radha Polymers:** Considering the fact that the rail pads are being used since past so many years and the ageing tests aircady being performed on the pads, this test is not required to be added. The	specification. It is experienced that lesser ageing time is not sufficient to ensure proper ageing of the material. Hence, ageing time with the respective values as per previous version of specification has been restored.	19. Ash content % Approved value + 5 Subject to not exceeding 27% Approved value ± 5 Subject to not exceeding 27% IS: 3400 (Part 22) 20. Specific gravity - Approved value + 0.03, Subject to not exceeding 1.27 Approved value + 0.03, Subject to not exceeding 1.27 IS:3400 (Part IX) **11** Thermogravimetric Analysis (TGA) for Polymercontent % >50 >50 AS M-E1131− 08 **12** Inclined Repeated Load Test (Durability Test) 0.5 million cycle 0.5 million cycle Appendix 'K' **13** Resilience by Vertical Rebound % Will be fixed after sample test Will be fixed after sample test ~~ASTM D-2632/~~ Appendix 'L' IS:3400-11 **14** Ozone test

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
Abrasion Test % Volume reduced not more than 20% Volume reduced not more than 20% ASTM D5963 or ISO 4649 Note: i) Hardness, Load-compression, Electrical Resistance & Compression Set test shall be carried out on the finished pad. All other tests shall be carried out from the prepared test slabs 6+ 0.5/-0.0mm thick and of size 200 x 130 mm using the same compound and vulcanized to the same degree. General procedures and conditions of the tests shall be as per IS:3400 without any infringement upon special conditions laid down in the respective appendices of this specification. For the purpose of confirming/co-relating the composition of the rubber test slabs with that of the finish product, Inspecting/Purchasing authorities may at their discretion shall perform the following tests both on the test slabs and the products, and shall comply with the requirements as given under:- Polymer identification: Identical Specific Gravity: The results shall be within ±0.02 % Ash Content: The results shall be within ±5%	addition of this test will only add financial burden on the company with no actual contribution towards enhancing the quality of life of rubber pads. **6. M/s Royal Elastomers :** Ozone Test should be a type test conducted at NABL labs, not a routine one. **For SN 15 of Table:** **1.Adinath Industries:** **2.M/s Parashath Enterprises** As per draft specification one sample to be tested for 0.2 million cycles which is required lots of time to test where 25- 40 lots of material are inspected every month in almost every company. Since the rail pads is in static mode beneath rail hence abrasion test is not required. **3. Ameenji Industries:** Ok. The Volume loss shall not more than 20%. **4. M/s Shiva Industries:** **5.M/s Shri Radha Polymers:** Abrasion Test is widely applicable to rubber products which have dynamic loading or application involving motion. Since Rail Pads are under static load, the applicability of this test for Rail Pads is of no use, hence should not be considered. **New Property Added** **1. Patil Rail Infrastructure Pvt.Ltd.:** Flex Property Test-Cycle-0.3million		No cracks No cracks ~~BS ISO 1431-1-2024~~ IS:3400-20 **15** Abrasion Test % Volume reduced not more than 20% Volume reduced not more than 20% ~~ASTM D5963 or~~ ~~ISO 4649~~ IS:3400-3 Note: i) Hardness, Load-compression, Electrical Resistance & Compression Set test shall be carried out on the finished pad. All other tests shall be carried out from the prepared test slabs 6+ 0.5/-0.0mm thick and of size 200 x 130 mm using the same compound and vulcanized to the same degree. General procedures and conditions of the tests shall be as per IS:3400 without any infringement upon special conditions laid down in the respective appendices of this specification. For the purpose of confirming/co-relating the composition of the rubber test slabs with that of the finish product, Inspecting/Purchasing authorities may at their discretion shall perform the following tests both on the test slabs and the products, and shall comply with the requirements as given under:- Polymer identification: Identical Specific Gravity: The results shall be within ±0.02 % Ash Content: The results shall be

<table>
<tr><th>Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)</th><th>Comments of Stake holders</th><th>RDSO's Remarks</th><th>Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)</th></tr>
<tr><td></td><td>cycle- 0.3million cycle -ASTMD430</td><td></td><td>within ±5%</td></tr>
<tr><td>5.3.1 PHYSICAL PROPERTIES OF NYLON CORD:

The cords shall be suitably treated to ensure proper adhesion between the rubber and Cord as specified in this standard.

The Nylon Cord shall be of style 1260/2 and the physical properties of the treated Cord shall conform to the following requirements:-

<table><tr><th>SN</th><th>Properties</th><th>Values</th><th>Method of Tests</th></tr><tr><td>1</td><td>Denier(gms/9000meters), Min</td><td>2400</td><td>IS:4910 Part I:1989 (Reaffirmed 2018)</td></tr><tr><td>2</td><td>No. of ends/inch</td><td>24±2</td><td>IS:1963 (Reaffirmed 2004)</td></tr><tr><td>3</td><td>Thickness(mm), min</td><td>~~0.75~~ 0.68</td><td>IS 4910 Part VIII: 1989 (Reaffirmed 2018)</td></tr><tr><td>4</td><td>Load at Break(Kg), min</td><td>16</td><td>IS 4910 Part II:1989 (Reaffirmed 2018)</td></tr><tr><td>5</td><td>Elongation at break(%), max</td><td>20</td><td>IS 4910 Part II:1989 (Reaffirmed 2018)</td></tr><tr><td>6</td><td>No. of twists/m</td><td>~~380/400~~ 385±15</td><td>ASTM-D-885M</td></tr></table></td><td>1. Patil Rail Infrastructure Pvt.Ltd.:

<table><tr><th></th><th>Properties</th><th>Values</th><th>Method of Tests</th></tr><tr><td></td><td>Denier(gms/9000meters), Min</td><td>2400 (1260/2) or (2x1260)</td><td>IS:4910 Part I:1989 (Reaffirmed 2018)</td></tr><tr><td></td><td>No. of ends/inch</td><td>24±2</td><td>IS:1963 (Reaffirmed 2004)</td></tr><tr><td></td><td>Thickness(mm), min</td><td>~~0.75~~ 0.68</td><td>IS 4910 Part VIII: 1989 (Reaffirmed 2018)</td></tr><tr><td></td><td>Load at Break(Kg), min</td><td>16</td><td>IS 4910 Part II:1989 (Reaffirmed 2018)</td></tr><tr><td></td><td>Elongation at break(%), max</td><td>20 (15-25)</td><td>IS 4910 Part II:1989 (Reaffirmed 2018)</td></tr><tr><td></td><td>No. of twists/m</td><td>~~380/400~~ 385±15</td><td>ASTM-D-885M</td></tr></table></td><td>Denier values have been modified to eliminate the mismatch of thickness and denier.</td><td>5.3.1 PHYSICAL PROPERTIES OF NYLON CORD:

The cords shall be suitably treated to ensure proper adhesion between the rubber and Cord as specified in this standard.

The Nylon Cord shall be of style ~~1260/2~~ 1680/2 and the physical properties of the treated Cord shall conform to the following requirements:-

<table><tr><th>SN</th><th>Properties</th><th>Values</th><th>Method of Tests</th></tr><tr><td>1</td><td>Denier(gms/9000meters), Min</td><td>~~2400~~ 3200</td><td>IS:4910 Part I:1989 (Reaffirmed 2018)</td></tr><tr><td>2</td><td>No. of ends/inch</td><td>24±2</td><td>IS:1963 (Reaffirmed 2004)</td></tr><tr><td>3</td><td>Thickness(mm), min</td><td>0.75</td><td>IS 4910 Part VIII: 1989 (Reaffirmed 2018)</td></tr><tr><td>4</td><td>Load at Break(Kg), min</td><td>16</td><td>IS 4910 Part II:1989</td></tr></table></td></tr>
</table>

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
			<table><tr><td></td><td></td><td></td><td>(Reaffirmed 2018)</td></tr><tr><td>5</td><td>Elongation at break(%), max</td><td>20</td><td>IS 4910 Part II:1989 (Reaffirmed 2018)</td></tr><tr><td>6</td><td>No. of twists/m</td><td>~~380/400~~ 320±15</td><td>ASTM-D-885M</td></tr></table>
5.3.2 **ADHESION BETWEEN THE CORD AND RUBBER:**			
5.3.2.1 Adhesion between Cord and Rubber (H-Pull test) shall be 10kgf, min. tested in a manner ASTM-D-2138.	**1.M/s Shah Elastomer:** Peel adhesion test is mentioned only at the time of quality audit, and H- pull test is included in regular tests. Peel adhesion is related to product and for conducting H-pull test, samples are specially prepared from same compound . So we suggest that Peel adhesion test should be included as a regular test and h-pull test should be done only at the time of quality audit or initial approval.	The comments of the firm are accepted and the Para has been modified	5.3.2.1 Adhesion between Cord and Rubber (H-Pull test) shall be 10 kgf, min. tested in a manner ASTM-D-2138. H-Pull test shall be conducted during initial approval and / or at firm's premises during quality audit of firms.
5.3.2.2 The Peel Adhesion shall be 4.0Kgf.(min.), tested as per IS:3400 Part V:1986(Reaffirmed 2019) with test specimen of 20mm width cut from the Nylon Cord Reinforced Grooved Rubber Sole Plate. Peel Adhesion Test shall be conducted during initial approval and / or at firm's premises during quality audit of firms.			5.3.2.2 The Peel Adhesion shall be 4.0 kgf (min), tested as per IS:3400 Part V:1986 (Reaffirmed 2019) with test specimen of 20 mm width cut from the Nylon Cord Reinforced Grooved Rubber Sole Plate. ~~Peel Adhesion Test shall be conducted during initial approval and / or at firm's premises during quality audit of firms.~~
5.3.3 **BREAKING LOAD:** The breaking load of Nylon Cord Reinforced Grooved Rubber Sole Plate tested at a machine speed of 300mm/minute on test specimen of 20±0.5mm width, cut from the Nylon Cord Reinforced Grooved Rubber Sole Plate shall be 350kgf min(mid value of 5 test specimen arranged in decreasing order) and not less than 325kgf for any individual test specimen. The test specimens shall be cut from sole plates such that the groove coincides with the central line of the test specimen.	Nil	No Change proposed	5.3.3 **BREAKING LOAD:** The breaking load of Nylon Cord Reinforced Grooved Rubber Sole Plate tested at a machine speed of 300mm/minute on test specimen of 20±0.5mm width, cut from the Nylon Cord Reinforced Grooved Rubber Sole Plate shall be 350kgf min(mid value of 5 test specimen arranged in decreasing order) and not less than 325kgf for any individual test specimen. The test specimens shall be cut from sole plates such that the groove coincides with the central line of the test specimen

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6.0 FINGER PRINTING OF CHEMICAL COMPOSITION (SPECIFIC GRAVITY AND ASH CONTENT: Specific gravity and Ash content of Rail pads shall be as per the relevant clause 5.1 or 5.2 or 5.3 as applicable. Finger printing of chemical composition of Rail pads shall be done by measuring the values of specific gravity and ash content. The values of Specific Gravity and Ash content shall not vary from initial approved values and specified tolerance duly communicated to the firm at the time of approval so that there will be no major change in composition of Rail pads in regular supply. The manufacturer if so desires shall be permitted to seek changes in the specific gravity and percent ash content of the approved samples within specified tolerances subject to the maximum limits set forth for these properties in relevant clause 5.1 or 5.2 or 5.3 as applicable. Any such changes will be permitted after evaluation of fresh samples by RDSO as per the extant policy.	Nil	No Change proposed	**6.0 FINGER PRINTING OF CHEMICAL COMPOSITION (SPECIFIC GRAVITY AND ASH CONTENT:** Specific gravity and Ash content of Rail pads shall be as per the relevant clause 5.1 or 5.2 or 5.3 as applicable. Finger printing of chemical composition of Rail pads shall be done by measuring the values of specific gravity and ash content. The values of Specific Gravity and Ash content shall not vary from initial approved values and specified tolerance duly communicated to the firm at the time of approval so that there will be no major change in composition of Rail pads in regular supply. The manufacturer, if so desires shall be permitted to seek changes in the specific gravity and percent ash content of the approved samples within specified tolerances subject to the maximum limits set forth for these properties in relevant clause 5.1 or 5.2 or 5.3 as applicable. Any such changes will be permitted after evaluation of fresh samples by RDSO as per the extant policy.
7.0 DIMENSIONS AND TOLERANCES: Rail pads shall meet with requirement of dimensions and tolerances as per the relevant drawings. The sample pads shall be checked for the dimensions by means of approved inspection gauges as per RDSO drawings. Unless otherwise specified tolerance of ±5mm shall be allowed on the length, + 0/-2 mm on width, and + 0.5/-0.0 mm on the thickness.	Nil	No Change proposed	**7.0 DIMENSIONS AND TOLERANCES:** Rail pads shall meet with requirement of dimensions and tolerances as per the relevant drawings. The sample pads shall be checked for the dimensions by means of approved inspection gauges as per RDSO drawings. Unless otherwise specified tolerance of ±5mm shall be allowed on the length, + 0/-2 mm on width, and + 0.5/-0.0 mm on the thickness.
8.0 MARKING : Each Rail pad shall bear the following marking in 0.8mm deep	Nil	No Change proposed	**8.0 MARKING :** Each Rail pad shall bear the following marking in

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raised letters/figures as shown in the respective drawings of rail pad: a) Manufacturers' initials or trade mark. b) First 2 digit for the month and last two digit for years as follows: 01-02. 02-02 etc. c) Drawing Number **Note:** For easy identification of the 'TOP' surface of pad in field, a yellow colour un-vulcanized rubber label of minimum preferable size 25mm X 10mm shall be stick on the Compound 'A' hard layer side of Composite GRSP before vulcanization. After vulcanization, the yellow label should be distinctly visible on the 'TOP' surface of the pad. Marking should be done on Compound 'A' hard layer side of Composite GRSP.			0.8mm deep raised letters/figures as shown in the respective drawings of rail pad: a) Manufacturers' initials or trade mark. b) First 2 digit for the month and last two digit for years as follows: 01-02. 02-02 etc. c) Drawing Number **Note:** For easy identification of the 'TOP' surface of pad in field, a yellow colour un-vulcanized rubber label of minimum preferable size 25mm X 10mm shall be stick on the Compound 'A' hard layer side of Composite GRSP before vulcanization. After vulcanization, the yellow label should be distinctly visible on the 'TOP' surface of the pad. Marking should be done on Compound 'A' hard layer side of Composite GRSP.
9.0 FREEDOM FROM DEFECTS: The Rail pads shall have clean cut sides and shall be free from defects such as porosity, blow holes or the presence of any other extraneous matter. The Rail pads shall also have smooth surface and the grooves shall be unobstructed at the ends and along their whole length. In case of Nylon Cord Reinforced GRSP, there shall be no exposure of Nylon Cord outside the pad surface and within the grooves.	Nil	No Change proposed	**9.0 FREEDOM FROM DEFECTS:** The Rail pads shall have clean cut sides and shall be free from defects such as porosity, blow holes or the presence of any other extraneous matter. The Rail pads shall also have smooth surface and the grooves shall be unobstructed at the ends and along their whole length. In case of Nylon Cord Reinforced GRSP, there shall be no exposure of Nylon Cord outside the pad surface and within the grooves.
10.0 PRE-ACCEPTANCE TESTS: 10.1 In case of unapproved and unregistered firms, prior to	Nil	No Change proposed	**10.0 PRE-ACCEPTANCE TESTS:** 10.1 In case of unapproved and unregistered

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regular production samples of rail pad shall be approved by the approving authority as per test scheme given in Appendix ~~'K'~~ 'O'. 10.2 For approval/acceptance, the sample shall meet the requirements given in 5.1 or 5.2 or 5.3 as applicable and 7 & 9 of this specification.			firms, prior to regular production samples of rail pad shall be approved by the approving authority as per test scheme given in Appendix ~~'K'~~ 'O'. 10.2 For approval/acceptance, the sample shall meet the requirements given in 5.1 or 5.2 or 5.3 as applicable and 7 & 9 of this specification.
11.0 ACCEPTANCE TESTS			
11.1 **LOT SIZE**: For the purpose of inspection, 10,000 numbers of rail pad or part thereof shall constitute a lot. However for Nylon cord Reinforced GRSP, 5000 nos. or part thereof shall be count a lot.	Nil	No Change proposed	11.1 **LOT SIZE**: For the purpose of inspection, 10,000 numbers of rail pad or part thereof shall constitute a lot. However for Nylon cord Reinforced GRSP, 5000 nos. or part thereof shall be count a lot.
11.2 **SAMPLE SIZE**: Sampling scale for dimensional, and visual check shall be as follows: Quantity of pads Number of samples Per lot 25 The system of sampling shall be as per IS: 4905. For Nylon cord Reinforced GRSP, Minimum 1% of the lot size, subject to minimum 10 nos. samples per lot shall be checked for dimensions and tolerances stipulated in the drawing. Ten nos. samples of Nylon cord Reinforced GRSP shall be selected at random from each lot, and shall be subjected to destructive tests as required for conducting various tests specified. However, any deviation in the distribution of the samples for different tests shall be at the discretion of the Inspecting/Purchasing authority.	Nil	No Change proposed	11.2 **SAMPLE SIZE**: Sampling scale for dimensional, and visual check shall be as follows: Quantity of pads Number of samples Per lot 25 The system of sampling shall be as per IS: 4905. For Nylon cord Reinforced GRSP, Minimum 1% of the lot size, subject to minimum 10 nos. samples per lot shall be checked for dimensions and tolerances stipulated in the drawing. Ten nos. samples of Nylon cord Reinforced GRSP shall be selected at random from each lot, and shall be subjected to destructive tests as required for conducting various tests specified. However, any deviation in the distribution of the samples for different tests shall be at the discretion of the Inspecting/Purchasing authority
11.3 **TESTS**: 11.3.1 Except for dimensions and Weight Test, the scheme of	**Patil Rail Infrastructure Pvt.Ltd.:** **For 11.3.4:** One sample Rail pads per lot shall be	Comments of the firm are not clear.	11.3 **TESTS**: 11.3.1 Except for dimensions and Weight Test,

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testing for the inspection of a lot of Rail pads shall be as per Appendix ~~'K'~~ 'O'. 11.3.2 The test methods shall be as per Appendix 'A' to 'O' and the criteria for acceptance and rejection of the particular test shall be as per relevant Clause 5.1 or 5.2 or 5.3 and clauses 7 & 9. However, all the values obtained shall meet the requirement of the specification. 11.3.3 Weight Test: The sample Rail pads shall be checked for the weight by means of digital weighing machine, and shall meet with the requirement of maximum weight as given in Appendix 'N' 'M'. Sample size for weight test shall be as per IS–2500 (Part-1):2000 assuming an AQL of 2.5% and inspection level II. For weight test, the sample size and the acceptance & rejection number is summarized in Appendix ~~'O'~~ 'N' of this standard. **Note**: Weight test shall be done only for rail pads mentioned in Appendix ~~'N'~~ 'M' of this specification. 11.3.4 One sample Rail pads per lot shall be tested for Abrasion test for 0.2 million cycle in accordance with the ASTM D5963 (Rubber Property—Abrasion Resistance (Rotary Drum Abrader)) or ISO 4649 (Rubber—Determination of resistance to abrasion using a rotating cylindrical drum device).	tested for Abrasion test ~~for 0.2 million cycle~~ **(loss of volume or weight)** in accordance with the ASTM D5963 (Rubber Property—Abrasion Resistance (Rotary Drum Abrader)) or ISO 4649 (Rubber—Determination of resistance to abrasion using a rotating cylindrical drum device).	However, separate Appendix-S for conducting the test has been added.	the scheme of testing for the inspection of a lot of Rail pads shall be as per Appendix 'O'. 11.3.2 The test methods shall be as per Appendix 'A' to 'O' and the criteria for acceptance and rejection of the particular test shall be as per relevant Clause 5.1 or 5.2 or 5.3 and clauses 7 & 9. However, all the values obtained shall meet the requirement of the specification. 11.3.3 Weight Test: The sample Rail pads shall be checked for the weight by means of digital weighing machine, and shall meet with the requirement of maximum weight as given in Appendix 'N' 'M'. Sample size for weight test shall be as per IS–2500 (Part-1):2000 assuming an AQL of 2.5% and inspection level II. For weight test, the sample size and the acceptance & rejection number is summarized in Appendix ~~'O'~~ 'N' of this standard. **Note**: Weight test shall be done only for rail pads mentioned in Appendix 'M' of this specification. 11.3.4 One sample Rail pads per lot shall be tested for Abrasion test for 0.2 million cycle in accordance with the ASTM D5963 (Rubber Property—Abrasion Resistance (Rotary Drum Abrader)) or ISO 4649 (Rubber—Determination of resistance to abrasion using a rotating cylindrical drum device).
12.0 RE-TEST:			
12.1 Should the test results be not satisfactory in more than one property under test clause 11.3 (excluding dimensions) no re-testing shall be done and the entire lot is rejected and the rejected rail pads shall be cut into	Nil	No Change proposed	12.1 Should the test results be not satisfactory in more than one property under test clause 11.3 (excluding dimensions) no re-testing shall be done and the entire lot is rejected

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pieces and made unusable.			and the rejected rail pads shall be cut into pieces and made unusable.
12.2 Should the samples fail in only one property under test clause 11.3 (other than dimensions and weight test) the particular test shall be repeated in the same manner with twice the number of samples drawn from the same lot. For acceptance of the lot, each sample should meet with the acceptance requirements of that particular test. If the samples fail again, the entire lot will be rejected.	Nil	No Change proposed	12.2 Should the samples fail in only one property under test clause 11.3 (other than dimensions and weight test) the particular test shall be repeated in the same manner with twice the number of samples drawn from the same lot. For acceptance of the lot, each sample should meet with the acceptance requirements of that particular test. If the samples fail again, the entire lot will be rejected.
12.3 Should the samples fail in dimensions, the manufacture may re-offer the Rail pads lot-wise, only once after sorting out the defectives, after written permission from the inspecting authority. The re-offered material, only if it passes the dimension test, shall be inspected for all the tests in terms of clause 11.3, if the re-offered samples fail again, the entire lot will be rejected.	Nil	No Change proposed	12.3 Should the samples fail in dimensions, the manufacture may re-offer the Rail pads lot-wise, only once after sorting out the defectives, after written permission from the inspecting authority. The re-offered material, only if it passes the dimension test, shall be inspected for all the tests in terms of clause 11.3, if the re-offered samples fail again, the entire lot will be rejected.
12.4 Should the samples fail in weight test, the entire lot shall be rejected. However, this test shall be done only for rail pads mentioned in Appendix ~~'N'~~ 'M' of this specification.	Nil	No Change proposed	12.4 Should the samples fail in weight test, the entire lot shall be rejected. However, this test shall be done only for rail pads mentioned in Appendix ~~'N'~~ 'M' of this specification.
13.0 FINAL INSPECTION/TESTING AND DOCUMENTATION: The manufacturer shall carryout the final inspection and testing internally in accordance with the requirement of tests under clause 11.3 and submit the internal test report along with the inspection call.	Nil	No Change proposed	**13.0 FINAL INSPECTION/TESTING AND DOCUMENTATION:** The manufacturer shall carryout the final inspection and testing internally in accordance with the requirement of tests under clause 11.3 and submit the internal test report along with the inspection call.
14.0 PACKING:			
14.1 The Rail pads shall be packed such that each of pads in following packages are placed flat on top of one another and bound by rubber bands in two perpendicular directions.	**1. Ameenji Industries** Generally the NCRGRSP should be supplied in the form of Sets and each set contains different sizes of pads, it is not	The comments of the firm have been examined.	14.1 The Rail pads shall be packed such that each of pads in following packages are placed flat on top of one another and bound by rubber bands in two perpendicular

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a) 50 pads of 6.2mm Composite GRSP/6mm GRSP or b) 25 pads of 10mm Composite GRSP/ GRSP or c) 50 pads for 6mm or 25 pads for 10mm or part thereof for Nylon Cord Reinforced GRSP, the rail pads for one set turnout should preferably be packed suitably for easy identification.	feasible to bundle the pads and makes confusion in the installation at consignee end. **2.M/s Shri Radha Polymers:** As the GRSP and NCGRSP for turnouts consists of different drawings in different quantities it is impossible to pack in lots of 50 nos. hence the same cannot be made applicable to NCGRSP and GRSP for turnouts. **3.M/s ROYAL FASTENERS NE:** For Packing (14.1 c and 14.2), fixed bundling and vacuum-sealed packaging are difficult for Turnout Sets as turnout sets are variable size of pads, so it cannot be clubbed together.	For, NCGRSP and GRSP for turnouts are to be placed in sealed, moisture-proof, and dust-resistant polyethylene bags and the bag shall be vacuum-sealed to remove excess air.	directions. d) 50 pads of 6.2mm Composite GRSP/6mm GRSP or e) 25 pads of 10mm Composite GRSP/ GRSP or f) 50 pads for 6mm or 25 pads for 10mm or part thereof for Nylon Cord Reinforced GRSP, the rail pads for one set turnout should preferably be packed suitably for easy identification.
14.2 Packing Method: The rubber bands used for packing the pads shall be of 15-20 mm width and due care shall be taken to avoid any extra stress developed in such packing. The rail pads shall be securely packed in sealed, moisture-proof, and dust-resistant polyethylene bags. Each bag shall be vacuum-sealed to remove excess air, ensuring optimal protection against environmental factors. Six such sealed packets placed flat one upon another ~~shall then be placed in a plastic bag / HDPE bag (except PVC bag)~~ and this bags shall be placed in a corrugated box conforming to IS:7151-91, a quality suitable for para dropping of supplies and has waterproofing property for the outer layers of the box, to avoid any damage in transit. This corrugated box shall also be bound by two plastic straps of 15-20mm width in two perpendicular directions using suitable strapping tensioner & sealer tool. The packing shall ensure that no displacement of rail pads should occur during transit.	**1.Adinath Industries:** There is no problem at current packing where product remains safe and it protects from environmental condition supported by corrugated boxes confirming to IS:7151 In case of Tune out sets or NCR GRSP Sets pads are different size of pad it is not possible to bundle these pad and packed as per your required. **2. Ameenji Industries** : Generally, this moisture-proof, and dust-resistant packing is recommended for highly environmental sensitive components like medical & electronic devices, etc. to not exposed to environmental conditions. But, Rail Pads will be used in extreme environmental conditions and load applications Hence, this type of packing may not be required and the existing packing condition is	At present, rail pads are to be tested for all parameters up to the period of one year at the consignee end. Hence the moisture-proof, and dust-resistant polyethylene bags with vacuum-sealing is required to ensure preservation of the quality of rail pad during storage.	14.2 Packing Method: The rubber bands used for packing the pads shall be of 15-20 mm width and due care shall be taken to avoid any extra stress developed in such packing. The rail pads shall be securely packed in sealed, moisture-proof, and dust-resistant polyethylene bags. Each bag shall be vacuum-sealed to remove excess air, ensuring optimal protection against environmental factors. Six such sealed packets placed flat one upon another ~~shall then be placed in a plastic bag / HDPE bag (except PVC bag)~~ and this bags shall be placed in a corrugated box conforming to IS:7151-91, a quality suitable for para dropping of supplies and has waterproofing property for the outer layers of the box, to avoid any damage in transit. This corrugated box shall also be bound by two plastic straps of 15-20mm width in two perpendicular directions using suitable strapping tensioner & sealer tool. The packing

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	enough. **3.M/s Parashath Enterprises** There is no problem at current packing where product remains safe and it protects from environmental condition supported by corrugated confirming boxes to specification and has water proofing property for the outer layer of box, to avoid any damage in transit. In case of Turn out sets or NCR GRSP Sets, since there are different sizes of pads it is not feasible to bundle these pads. **4.M/s Shah Elastomer:** Polyethylene Bags are not environment friendly being non-biodegradable. Rubber Pads are used in extreme environments and as such do not require such packaging norms. Existing packing criteria is sufficient to safeguard the pads. In case of Turnout Sets since there are various sizes of pads it is not feasible to bundle the pads, so bundling should be exempted for these items. **5. M/s Shiva Industries:** There is no problem at current packing where product remains safe and it protects from environmental condition supported by corrugated boxes confirming to IS:7151 for para dropping of supplies and has water proofing property for the outer layer of box, to avoid any damage in transit. Hence addition of vacuum sealed bag name should be omitted. **5.M/s Shri Radha Polymers:**		shall ensure that no displacement of rail pads should occur during transit.

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	The present packing system being followed has been in place since many years and has been quite satisfactory. Also there doesn't seem to be any recorded complaints regarding the same. The present system of using HDPE bags ensures that packed material stays intact in the bag and doesn't get spread out even if there is damage to the outside corrugated bags during loading unloading and transit. Polyethylene bags cannot provide durability in packing and will get tor or damaged if the material spreads out after damage to the corrugated box. Also the fine and sharp edges of the rubber itself can damage the PE bags. In casc of Turnout Sets (GRSP or NCR GRSP), it will be very difficult to pack the pads in the suggested bundle i.e. 50 pads for 6mm or 25 pads for 10mm thick pads as it comprises of many different drawings in different numbers. The applicability of this type of packing will result in additional cost due to the packing process becoming time consuming and cumbersome. **6.M/s ROYAL FASTENERS NE:** For Packing (14.1 c and 14.2), fixed bundling and vacuum-sealed packaging are difficult for Turnout Sets as turnout sets are variable size of pads, so it cannot be clubbed together.		
14.~~2~~3 The boxes shall be sealed and labeled bearing: a) Name of supplier b) Purchase order number and date c) Quantity	Nil	No Change proposed	23 The boxes shall be sealed and labeled bearing: a) Name of supplier b) Purchase order number and date

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d) Consignee e) Lot no. f) Box no.			c) Quantity d) Consignee e) Lot no. f) Box no.
15.0 TEST FACILITIES: The Rail pad manufacturer shall install all the necessary test facilities for inspection of Rail pad in a separate well lit, clean and properly ventilated laboratory cum inspection room provided with easily maintainable floor and platform.	Nil	No Change proposed	**15.0 TEST FACILITIES:** The Rail pad manufacturer shall install all the necessary test facilities for inspection of Rail pad in a separate well lit, clean and properly ventilated laboratory cum inspection room provided with easily maintainable floor and platform.
16.0 INSPECTING GAUGES: The inspection gauges for dimensional check shall conform to the respective gauge drawings. The manufacturer shall submit two sets of inspection gauges for approval by inspecting officer. One set shall be used as 'Master Gauge' and shall be preserved safely by the Rail pad manufacturer. The second set shall be for use by the inspecting officer. For internal checks the firm should use separate set of gauges.	Nil	No Change proposed	**16.0 INSPECTING GAUGES:** The inspection gauges for dimensional check shall conform to the respective gauge drawings. The manufacturer shall submit two sets of inspection gauges for approval by inspecting officer. One set shall be used as 'Master Gauge' and shall be preserved safely by the Rail pad manufacturer. The second set shall be for use by the inspecting officer. For internal checks the firm should use separate set of gauges.
17.0 DISPOSAL OF REJECTED GROOVED RUBBER SOLE PLATES: The rejected Rail pads shall be cut into pieces and made unusable.	Nil	No Change proposed	**17.0 DISPOSAL OF REJECTED GROOVED RUBBER SOLE PLATES:** The rejected Rail pads shall be cut into pieces and made unusable.
18.0 GENERAL: 18.1 The manufacturer shall furnish at his own cost, the Rail pads required for all tests and shall provide necessary manpower and facilities for carrying out tests at his cost. 18.2 Purchaser/Inspecting officer shall have free access to the works of the manufacturer at all reasonable times and shall be at liberty to inspect the manufacturing at	Nil	No Change proposed	**18.0 GENERAL:** 18.1 The manufacturer shall furnish at his own cost, the Rail pads required for all tests and shall provide necessary manpower and facilities for carrying out tests at his cost. 18.2 Purchaser/Inspecting officer shall have free access to the works of the

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any stage and to call for records pertaining to manufacture and testing which shall be made available within a reasonable time. All test and measuring equipments shall have valid calibration certificates to ensure accurate, reliable and reproducible test results. 18.3 The material shall be offered for inspection as per call letter given in Appendix ~~'L'~~ 'P'. 18.4 The material shall be stored as per the guidelines laid down in Appendix '~~M~~' 'Q' .			manufacturer at all reasonable times and shall be at liberty to inspect the manufacturing at any stage and to call for records pertaining to manufacture and testing which shall be made available within a reasonable time. All test and measuring equipments shall have valid calibration certificates to ensure accurate, reliable and reproducible test results. 18.3 The material shall be offered for inspection as per call letter given in Appendix 'P'. 18.4 The material shall be stored as per the guidelines laid down in Appendix 'Q' .
APPENDIX 'A' (IRST-55-~~2023~~ 2025) **DETERMINATION OF HARDNESS** A.1 Number of test samples. Five sample Rail pads shall be considered for hardness test. A.2 Test Methods: A.2.1 Apparatus: Shore 'A' durometer A 3 Test method IS: 3400 Part II shall apply A3.1 It is proposed that minimum 5 samples shall be checked for shore hardness 'A'. However, following method may be adopted for checking hardness of the Rail pads. The Rail pads under test shall be placed on another Rail pad of same drawing, such that the grooves at upper side of both the Rail pads are on the same line. Hardness shall be measured on the portion of the pad in which no groove exists. Five measurements shall be taken at different places on each sole plate.	Nil	No Change proposed	**APPENDIX 'A'** (IRST-55-2025) **DETERMINATION OF HARDNESS** A.1 Number of test samples. Five sample Rail pads shall be considered for hardness test. A.2 Test Methods: A.2.1 Apparatus: Shore 'A' durometer A 3 Test method IS: 3400 Part II shall apply A3.1 It is proposed that minimum 5 samples shall be checked for shore hardness 'A'. However, following method may be adopted for checking hardness of the Rail pads. The Rail pads under test shall be placed on another Rail pad of same drawing, such that the grooves at upper side of both the Rail pads are on the same line. Hardness shall be measured on the portion of the pad in

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A.4 Report: A.4.1: All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.			which no groove exists. Five measurements shall be taken at different places on each sole plate. A.4 Report: A.4.1: All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.
APPENDIX 'B' (IRST-55-~~2023~~ 2025) **DETERMINATION OF TENSILE STRENGTH AND ELONGATION AT BREAK %** B.1 No. of test samples – Five test specimens shall be tested B.2 Test Method IS:3400 Pt.I shall apply. B.2.1 The test specimens shall be in the shape of dumb bell. The Dumb-bell shall have the outline and dimensions as shown in Figure-3. Two test specimens shall be cut from each of the five pads such that the groove coincides with the central line of the test specimen. The part between the upper edges of the connecting shoulders shall have uniform width and thickness along its length. Gauge length (Lo=50mm) shall be marked on the test specimens for measuring the elongation. B.2.2 Five test specimens, one from each of the five sample pads, shall be tested before ageing and the remaining five test specimens shall be tested after ageing at 100 ± 1°C for ~~72~~ 96+ 0/-2 hours in an air oven as per IS : 3400 Pt. IV. "Accelerated ageing". The specimens cut from the same pads shall bear the same number. B.3 Tensile strength (T.S.) B.3.1 The tensile strength shall be calculated by the formula:	Nil	No Change proposed	**APPENDIX 'B'** (IRST-55-2025) **DETERMINATION OF TENSILE STRENGTH AND ELONGATION AT BREAK %** B.1 No. of test samples – Five test specimens shall be tested B.2 Test Method IS:3400 Pt.I shall apply. B.2.1 The test specimens shall be in the shape of dumb bell. The Dumb-bell shall have the outline and dimensions as shown in Figure-3. Two test specimens shall be cut from each of the five pads such that the groove coincides with the central line of the test specimen. The part between the upper edges of the connecting shoulders shall have uniform width and thickness along its length. Gauge length (Lo=50mm) shall be marked on the test specimens for measuring the elongation. B.2.2 Five test specimens, one from each of the five sample pads, shall be tested before ageing and the remaining five test specimens shall be tested after ageing at 100 ± 1°C for 96+ 0/-2 hours in an air oven as per IS : 3400 Pt. IV. "Accelerated ageing". The specimens cut from the

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T.S. (Kg/cm^2) = Breaking load (kg) / Initial cross-sectional area (cm^2) Note: For calculating the initial cross-sectional area of the test specimen, sectional area of grooves shall not be deducted. B.3.2 Percent retention of tensile strength after ageing: B.3.2.1 Percent retention of tensile strength after ageing shall be calculated with respect to the reported values before and after ageing. B.3.2.2 The percent retention of tensile strength after ageing shall be calculated by the formula:- % retention of T.S. = T.S. after ageing X 100 / T.S. before ageing B.3.3 Elongation at break B.3.3.1 The elongation at break shall be expressed in percent and calculated by the formula: Elongation at break (%) = L - 50 X 100 50 where: L= Length in mm between bench marks at break. B.3.4. Percent retention of elongation after ageing B.3.4.1 Percent retention of elongation after ageing shall be calculated with respect to reported values before and after ageing. B.3.4.2 Percent retention of the elongation at break after ageing shall be calculated by the formula: % retention = Elongation at break (%) after ageing X 100 / Elongation at break (%) before ageing. B.4 Report: B.4.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.			same pads shall bear the same number. B.3 Tensile strength (T.S.) B.3.1 The tensile strength shall be calculated by the formula: T.S. (Kg/cm^2) = Breaking load (kg) / Initial cross-sectional area (cm^2) Note: For calculating the initial cross-sectional area of the test specimen, sectional area of grooves shall not be deducted. B.3.2 Percent retention of tensile strength after ageing: B.3.2.1 Percent retention of tensile strength after ageing shall be calculated with respect to the reported values before and after ageing. B.3.2.2 The percent retention of tensile strength after ageing shall be calculated by the formula:- % retention of T.S. = T.S. after ageing X 100 / T.S. before ageing B.3.3 Elongation at break B.3.3.1 The elongation at break shall be expressed in percent and calculated by the formula: Elongation at break (%) = L - 50 / 50 X 100 where: L= Length in mm between bench marks at break. B.3.4. Percent retention of elongation after ageing B.3.4.1 Percent retention of elongation after ageing shall be calculated with respect to reported values before and after ageing. B.3.4.2 Percent retention of the elongation at

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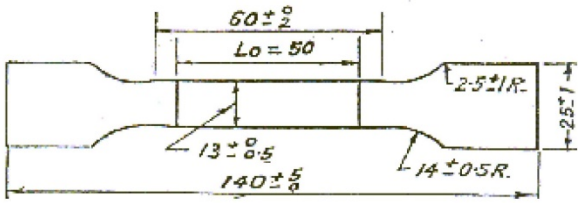
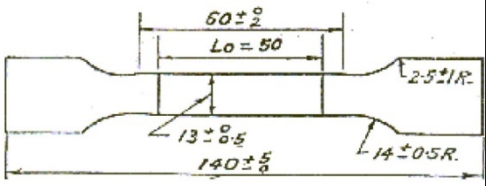
 FIGURE 3 All dimensions are in millimeters Note: The above sample shall be cut from top side of Rail pads.			break after ageing shall be calculated by the formula: % retention = Elongation at break (%) after ageing X 100 Elongation at break (%) before ageing. B.4 Report: B.4.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.  FIGURE 3 All dimensions are in millimeters Note: The above sample shall be cut from top side of Rail pads.
APPENDIX 'C' (IRST-55-~~2023~~ 2025) **DETERMINATION OF MODULUS (RELAXED) AT 100 % ELONGATION** C.1 Number of test samples -Three test pads shall be considered for the tests. C.2 Test specimens. C.2.1 Test specimens shall be cut and marked in similar manner as indicated in clause B.2.1 of Appendix 'B'. C.2.2 Three dumb bell specimens, one from each of the three sample pads shall be tested before ageing and the remaining three test specimens shall be tested after ageing at 100 ± 1°C for ~~72~~ 96+ 0/-2 hours in an air oven, as per IS : 3400 Part IV, "Accelerated ageing".	Nil	No Change proposed	**APPENDIX 'C'** (IRST-55-2025) **DETERMINATION OF MODULUS (RELAXED) AT 100 % ELONGATION** C.1 Number of test samples -Three test pads shall be considered for the tests. C.2 Test specimens. C.2.1 Test specimens shall be cut and marked in similar manner as indicated in clause B.2.1 of Appendix 'B'. C.2.2 Three dumb bell specimens, one from each of the three sample pads shall be tested before ageing and the remaining three test specimens shall be tested after ageing at

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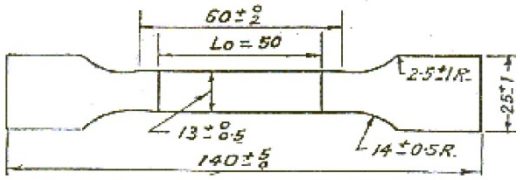
C.3. For test methods IS: 3400 Part I shall apply. The test specimen shall be stretched to 100% of its gauge length (i.e. upto 100mm) at the rate of 450-600 mm/mt. and then allowed to return to the normal position at the same rate. Immediately after the first stretching, the test specimen shall be re-stretched to 100% of its gauge length (i.e. upto 100mm) at the same rate, and the load shall be recorded. C.4 Calculations and Reporting: C.4.1 Calculations C.4.1.1 Modulus (relaxed) at 100% elongation shall be calculated by the formula: Modulus (relaxed) = Load at 100 % elongation (Kg) Initial cross-sectional area (cm^2) C.4.1.2 The initial cross-sectional area of the test specimen shall be considered in the same manner as in Clause B.3.1 of Appendix 'B'. C.4.1.3 Calculation of change of relaxed modulus after ageing at 100 ± 1° C for ~~72~~ 96+ 0/-2 hours shall be as given below: % change= B - A X 100 A where A = Relaxed Modulus before ageing. B = Relaxed modulus after ageing. C.4 Report: C.4.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.  FIGURE 3			100 ± 1°C for 96+ 0/-2 hours in an air oven, as per IS : 3400 Part IV, "Accelerated ageing". C.3. For test methods IS: 3400 Part I shall apply. The test specimen shall be stretched to 100% of its gauge length (i.e. upto 100mm) at the rate of 450-600 mm/mt. and then allowed to return to the normal position at the same rate. Immediately after the first stretching, the test specimen shall be re-stretched to 100% of its gauge length (i.e. upto 100mm) at the same rate, and the load shall be recorded. C.4 Calculations and Reporting: C.4.1 Calculations C.4.1.1 Modulus (relaxed) at 100% elongation shall be calculated by the formula: Modulus (relaxed) = Load at 100 % elongation (Kg) Initial cross-sectional area (cm^2) C.4.1.2 The initial cross-sectional area of the test specimen shall be considered in the same manner as in Clause B.3.1 of Appendix 'B'. C.4.1.3 Calculation of change of relaxed modulus after ageing at 100 ± 1° C for 96+ 0/-2 hours shall be as given below: % change= B - A X 100 A where A = Relaxed Modulus before ageing. B = Relaxed modulus after ageing. C.4 Report: C.4.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.

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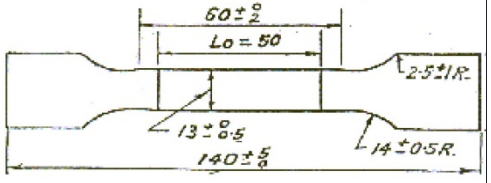
All dimensions in millimeters Note: The above sample shall be cut from top side of Rail pads.			 FIGURE 3 All dimensions in millimeters Note: The above sample shall be cut from top side of Rail pads.

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APPENDIX 'D' (IRST-55-~~2023~~ 2025) **DETERMINATION OF COMPRESSION SET SUBJECTED TO 50% COMPRESSION** D.1 Number of test samples. Three test pads shall be considered for the tests. D.2 Test specimens. D.2.1 Three round test specimens, one from each of the three sample test pads shall be cut 37 + 0.0/-0.3 mm in diameter and whose axial plane coincides with that of one of the grooves. D.3 Test Method. D.3.1For testing IS.3400 (Part X) shall apply. D.3.2 Thickness of test specimen (To) shall be measured and it shall be compressed in a compression device to 50% of its original thickness (To) by using suitable spacers. D.3.3 The assembly shall be kept at 100 ± 1°C for 24 + 0/-2 hours in an air oven. D.3.4 The device shall then be removed from the oven and allowed to cool at ambient temperature for 30-35 minutes. The test specimen shall then be removed from the device. The thickness (Tr) of test specimen shall be measured after 24 hours but not later than 48 hours from the time of removal from the device. D.4 Calculation and Reporting. D.4.1 Calculations: Compression set (%) shall be calculated by the formula: $\text{Compression set (\%)} = \frac{To - Tr}{To} \times 100$ D.5 Report:	Nil	No Change proposed	**APPENDIX 'D'** (IRST-55-**2025**) **DETERMINATION OF COMPRESSION SET SUBJECTED TO 50% COMPRESSION** D.1 Number of test samples. Three test pads shall be considered for the tests. D.2 Test specimens. D.2.1 Three round test specimens, one from each of the three sample test pads shall be cut 37 + 0.0/-0.3 mm in diameter and whose axial plane coincides with that of one of the grooves. D.3 Test Method. D.3.1For testing IS.3400 (Part X) shall apply. D.3.2 Thickness of test specimen (To) shall be measured and it shall be compressed in a compression device to 50% of its original thickness (To) by using suitable spacers. D.3.3 The assembly shall be kept at 100 ± 1°C for 24 + 0/-2 hours in an air oven. D.3.4 The device shall then be removed from the oven and allowed to cool at ambient temperature for 30-35 minutes. The test specimen shall then be removed from the device. The thickness (Tr) of test specimen shall be measured after 24 hours but not later than 48 hours from the time of removal from the device. D.4 Calculation and Reporting. D.4.1 Calculations: Compression set (%) shall be calculated by the

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D.5.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.			formula: Compression set (%) = $\frac{To - Tr}{To} \times 100$ D.5 Report: D.5.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.

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APPENDIX 'E' (IRST-55-~~2023~~ **2025**) **DETERMINATION OF TENSION SET(%) SUBJECTED TO 50% STRETCH** E.1 Number of test samples. Three test pads shall be considered for tests. E.2 Test specimens. E.2.1 Three test specimens of the type (Dumb bell) described in clause B.2.1of Appendix 'B' shall be prepared one from each of the three sample test pads. E.3 Test Method E.3.1 For testing IS: 3400 part XIII shall apply. E.3.2 The gauge length of 50 mm shall be marked on the test specimen and it shall be stretched in a suitable stretching device upto 50% of the gauge length. E.3.3 The device shall be then kept at 100 ± 1°C for 24 + 0/-2 hours in an air oven. E.3.4 The device shall then be withdrawn from the oven and allowed to cool at ambient temperature in stretched condition for 30-35 mts and then freed. E.3.5 The deformed length (Lr) over the gauge mark shall be measured after 24 hours but not later than 48 hours on removal from the oven. E.4 Calculation and Reporting. E.4.1 Calculations Tension set (%) shall be calculated by the formula Tension set (%) = $\frac{Lr-50}{50} \times 100$ E.5 Report: E.5.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this	Nil	No Change proposed	***APPENDIX 'E'*** (IRST-55-**2025**) **DETERMINATION OF TENSION SET(%) SUBJECTED TO 50% STRETCH** E.1 Number of test samples. Three test pads shall be considered for tests. E.2 Test specimens. E.2.1 Three test specimens of the type (Dumb bell) described in clause B.2.1of Appendix 'B' shall be prepared one from each of the three sample test pads. E.3 Test Method E.3.1 For testing IS: 3400 part XIII shall apply. E.3.2 The gauge length of 50 mm shall be marked on the test specimen and it shall be stretched in a suitable stretching device upto 50% of the gauge length. E.3.3 The device shall be then kept at 100 ± 1°C for 24 + 0/-2 hours in an air oven. E.3.4 The device shall then be withdrawn from the oven and allowed to cool at ambient temperature in stretched condition for 30-35 mts and then freed. E.3.5 The deformed length (Lr) over the gauge mark shall be measured after 24 hours but not later than 48 hours on removal from the oven. E.4 Calculation and Reporting. E.4.1 Calculations Tension set (%) shall be calculated by the formula

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specification.			Tension set (%) = Lr-50 X 100 50 E.5 Report: E.5.1 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.

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APPENDIX 'F' (IRST-55- ~~2023~~ **2025**) ***LOAD COMPRESSION TEST*** F.1 Two number samples to be tested per lot. The sample size will be same as the pad offered for inspection, only the horns (if there any) to be chopped off. The load to be applied, may be calculated as follows:- $\frac{t \times A}{260}$ Where A = Area of pad under test in square cm t = 1,5,10,15 & 20 tonne. Note : A- If horns are present these are to be chopped off before measurement of area. Note: B- If the actual pad size is big enough to cut a piece of size 200mm X 130mm, the test shall be done on test pieces of above said size. The size 200 mm x 130 mm i.e. area of 260 cm2 is the standard reference size. Note: C -Where area of the pad is less than 180 cm2. The test shall be conducted on specially prepared test specimen of size 130 mm x 200 mm. F.2 Apparatus: Compression testing machine: Capacity 50 tonne (min.) suitably fitted with two dial gauges capable of reading 1/100th of mm. The machine shall be fully automated and computerized with provision of recording of the readings of both dial gauges on applied loads. F.3 Test Condition: F.3.1 Test shall be carried out at 27± 2°C and at relative humidity 65 ± 5%. F.4 Test Method: The test specimen shall be placed between two rigid metal plates, the surfaces of which shall be smooth and shall absolutely flush with each other. The size of the plates shall be 210mm X 140mm (min.). A piece of '0' number emery paper	Nil	No Change proposed	**APPENDIX 'F'** (IRST-55- **2025**) ***LOAD COMPRESSION TEST*** F.1 Two number samples to be tested per lot. The sample size will be same as the pad offered for inspection, only the horns (if there any) to be chopped off. The load to be applied, may be calculated as follows:- $\frac{t \times A}{260}$ Where A = Area of pad under test in square cm t = 1,5,10,15 & 20 tonne. Note A: If horns are present these are to be chopped off before measurement of area. Note B: If the actual pad size is big enough to cut a piece of size 200mm X 130mm, the test shall be done on test pieces of above said size. The size 200 mm x 130 mm i.e. area of 260 cm2 is the standard reference size. Note C: Where area of the pad is less than 180 cm2. The test shall be conducted on specially prepared test specimen of size 130 mm x 200 mm. F.2 Apparatus: Compression testing machine: Capacity 50 tonne (min.) suitably fitted with two dial gauges capable of reading 1/100th of mm. The machine shall be fully automated and computerized with provision of recording of the readings of both dial gauges on applied loads. F.3 Test Condition: F.3.1 Test shall be carried out at 27± 2°C and at relative humidity 65 ± 5%. F.4 Test Method:

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shall be inserted between the test specimen and the metal plates both at the top and bottom. The measurement of thickness variation shall be carried out by means of two dial gauges of least count 0.01mm attached with hydraulic press and located in the middle of the shorter sides of the test specimen. **Note:** If required two layer of '0' number emery paper shall be inserted between the test specimen and the metal plates both at the top and bottom in case of 10mm GRSP/10mm Composite GRSP F.4.1 For GRSP (6mm & 10mm thick) & Nylon Cord Reinforced GRSP(6mm thick): Two consecutive loading of $\frac{20 \times A}{260}$ t shall be applied before any deformation readings are taken. A load of $\frac{A}{260}$ t shall be then applied and the dial gauges shall be adjusted for '0' reading. Loads in tonnes for 5, 10 & 15 t in the formula given above, then applied and when each load is static for one minute, the dial gauge readings shall be recorded at load corresponding to15 tonnes. The deformation to be considered for report shall be the average of the readings taken from 2 dial gauges at load corresponding to 15 tonnes, which shall not differ more than 0.3mm for a given load. F.4.2 For Composite GRSP (6.2mm thick) : Two consecutive loading of 15 t shall be applied before any deformation readings are taken. A load of 100 kg shall be then applied and the dial gauges shall be adjusted for '0' reading. Loads in tonnes for 1, 2, 3, 5,10,15 & 20 then applied and when each load is static for one minute, the dial gauge readings shall be recorded. The deformation to be considered for report shall be the average of the readings taken from 2 dial gauges at each load, which shall not differ more than 0.2mm for a given load. F.4.3 For Composite GRSP (10mm thick) & Nylon Cord Reinforced GRSP (10mm thick):			The test specimen shall be placed between two rigid metal plates, the surfaces of which shall be smooth and shall absolutely flush with each other. The size of the plates shall be 210mm X 140mm (min.). A piece of '0' number emery paper shall be inserted between the test specimen and the metal plates both at the top and bottom. The measurement of thickness variation shall be carried out by means of two dial gauges of least count 0.01mm attached with hydraulic press and located in the middle of the shorter sides of the test specimen. **Note:** If required two layer of '0' number emery paper shall be inserted between the test specimen and the metal plates both at the top and bottom in case of 10mm GRSP/10mm Composite GRSP F.4.1 For GRSP (6mm & 10mm thick) & Nylon Cord Reinforced GRSP(6mm thick): Two consecutive loading of $\frac{20 \times A}{260}$ t shall be applied before any deformation readings are taken. A load of $\frac{A}{260}$ t shall be then applied and the dial gauges shall be adjusted for '0' reading. Loads in tonnes for 5, 10 & 15 t in the formula given above, then applied and when each load is static for one minute, the dial gauge readings shall be recorded at load corresponding to15 tonnes. The deformation to be considered for report shall be the average of the readings taken from 2 dial gauges at load corresponding to 15 tonnes, which shall not differ more than 0.3mm for a given load. F.4.2 For Composite GRSP (6.2mm thick) : Two consecutive loading of 15 t shall be applied

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Two consecutive loading of 27 x A t shall be applied before any deformation s 260 Reading are taken. A load of A t shall be then applied and the dial gauges shall 260 be adjusted for '0' reading. Loads in tonnes for 2, 3, 5,10,15 & 20 then applied and when each load is static for one minute, the dial gauge readings shall be recorded at load corresponding to 20 tonne. The deformation to be considered for report shall be the average of the readings taken from 2 dial gauges at each load, which shall not differ more than 0.3 mm for a given load. F 5 - Report F.5.1 For GRSP (6mm & 10mm thick) & Nylon Cord Reinforced GRSP(6mm thick): F.5.1.1 Compression (mm) at a load 15 X A t for the two samples to be reported. 260 F.5.2 For Composite GRSP (6.2mm thick) : F.5.2.1 Calculate specific stress Kg/cm^2 by dividing the each applied load by the area (A) of the pad under test. Plot a graph of specific stress (Kg/cm^2) as 'Y' axis and deflection (mm) as 'X' axis. The deflection (mm) shall be noted corresponding to specific stress 3.85 Kg/cm2 as d1 and 57.70 Kg/cm2 as d2 and the difference between (d2-d1) shall be within the specified limit. The deflection at a specified stress of 1.2x260x1000Kg/cm^2 A shall not be less than 0.15 mm where the factor 260 is the area of the standard reference pad. F.5.3 For Composite GRSP (10mm thick) & Nylon Cord Reinforced GRSP(10mm thick): F.5.3.1 Compression (mm) at a load 20 x A t for the two sole plates. 260			before any deformation readings are taken. A load of 100 kg shall be then applied and the dial gauges shall be adjusted for '0' reading. Loads in tonnes for 1, 2, 3, 5,10,15 & 20 then applied and when each load is static for one minute, the dial gauge readings shall be recorded. The deformation to be considered for report shall be the average of the readings taken from 2 dial gauges at each load, which shall not differ more than 0.2mm for a given load. F.4.3 For Composite GRSP (10mm thick) & Nylon Cord Reinforced GRSP (10mm thick): Two consecutive loading of 27 x A t shall be applied before any deformation s 260 Reading are taken. A load of A t shall be then applied and the dial gauges shall 260 be adjusted for '0' reading. Loads in tonnes for 2, 3, 5,10,15 & 20 then applied and when each load is static for one minute, the dial gauge readings shall be recorded at load corresponding to 20 tonne. The deformation to be considered for report shall be the average of the readings taken from 2 dial gauges at each load, which shall not differ more than 0.3 mm for a given load. F 5 - Report F.5.1 For GRSP (6mm & 10mm thick) & Nylon Cord Reinforced GRSP(6mm thick): F.5.1.1 Compression (mm) at a load 15 X A t for the two samples to be reported. 260 F.5.2 For Composite GRSP (6.2mm thick) : F.5.2.1 Calculate specific stress Kg/cm^2 by dividing the each applied load by the area (A) of the pad under test. Plot a

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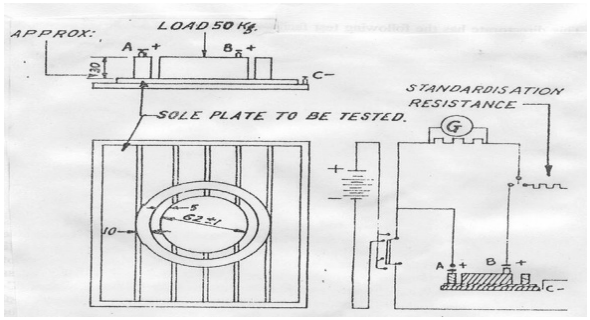
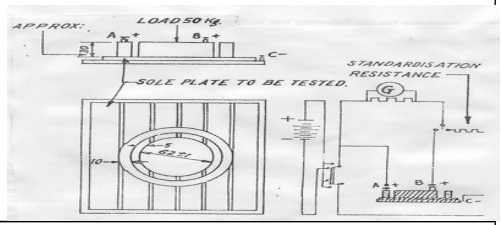
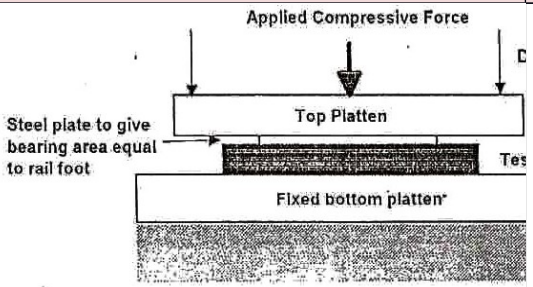
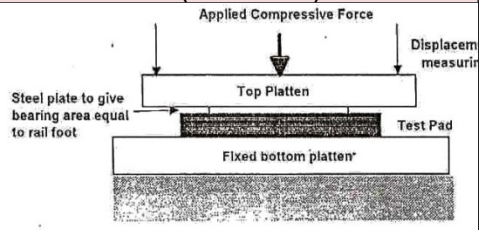
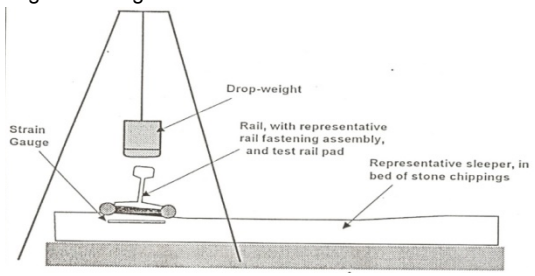
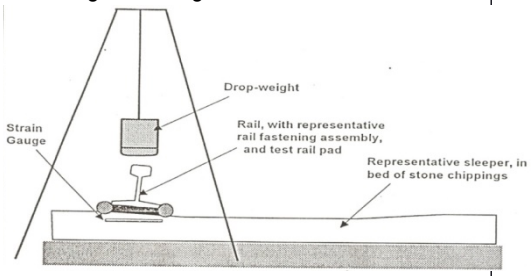
F.5.4 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.			graph of specific stress (Kg/cm^2) as 'Y' axis and deflection (mm) as 'X' axis. The deflection (mm) shall be noted corresponding to specific stress 3.85 Kg/cm2 as d1 and 57.70 Kg/cm2 as d2 and the difference between (d2-d1) shall be within the specified limit. The deflection at a specified stress of $\frac{1.2x260x1000Kg/cm^2}{A}$ shall not be less than 0.15 mm where the factor 260 is the area of the standard reference pad. F.5.3 For Composite GRSP (10mm thick) & Nylon Cord Reinforced GRSP(10mm thick): F.5.3.1 Compression (mm) at a load $\frac{20 \times A}{260}$ t for the two sole plates. F.5.4 All measurements to be reported. Each individual test value shall meet the acceptance requirement of this specification.

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
APPENDIX 'G' (IRST-55-~~2023~~ 2025) **DETERMINATION OF ELECTRICAL RESISTANCE** G.1 No. of test samples. G.1.1 Three test samples shall be considered for the test. G.1.2 Samples shall be tested first as such and again after immersion in distilled water for 48 hours at ambient temperature. G.2 Preparation of the test specimen The surface of the sole plate test specimens shall be gently rubbed with fine emery cloth for the purpose of removing any thin superficial layer of insulating substances with which they may be covered. G.3 Apparatus. Million Mega ohm-metre or any other suitable equipment capable of measuring electrical resistance more than 500 Megaohms. G.4 Test Method. G.4.1 For testing IS:3400 (Part XV) shall apply. G.4.2 The test arrangement shall be as given in Figure 4. The test specimen shall be placed on a metal plate whose dimensions are not less than those of the sole plates. On the test specimen shall then be placed a metal ring of iron or brass whose outer diameter shall be 92mm, inner dia 72mm and height 30 mm. Inside the metal ring a cylindrical metallic disc of iron or brass having 62 ± 1 mm diameter & height 30 mm, shall be placed in concentric fashion & subjected to a load of about 50 kg. The measuring circuit shall be completed as given in figure 4. Measurement shall be carried out at 200-250 volts after a charge lasting for 60 seconds and measurements shall be repeated after reversing the direction of the current. G.4.3 In case of test specimen immersed in distilled water it shall be ensured that the sole plates before being tested on	Nil	No Change proposed	**APPENDIX 'G'** (IRST-55-2025) **DETERMINATION OF ELECTRICAL RESISTANCE** G.1 No. of test samples. G.1.1 Three test samples shall be considered for the test. G.1.2 Samples shall be tested first as such and again after immersion in distilled water for 48 hours at ambient temperature. G.2 Preparation of the test specimen The surface of the sole plate test specimens shall be gently rubbed with fine emery cloth for the purpose of removing any thin superficial layer of insulating substances with which they may be covered. G.3 Apparatus. Million Mega ohm-metre or any other suitable equipment capable of measuring electrical resistance more than 500 Megaohms. G.4 Test Method. G.4.1 For testing IS:3400 (Part XV) shall apply. G.4.2 The test arrangement shall be as given in Figure 4. The test specimen shall be placed on a metal plate whose dimensions are not less than those of the sole plates. On the test specimen shall then be placed a metal ring of iron or brass whose outer diameter shall be 92mm, inner dia 72mm and height 30 mm. Inside the metal ring a cylindrical metallic disc of iron or brass having 62 ± 1 mm diameter & height 30 mm, shall be placed in concentric fashion & subjected to a load of about 50 kg. The measuring circuit shall be

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
removal from water shall be wiped off with a dry cloth or blotting paper so that no apparent trace of water remains, especially in the grooves. G.5 -Report G.5.1 All the Individual test value before as well as after immersion under water shall be reported and should meet the minimum requirement laid down before and after reversal of current.  Figure-4			completed as given in figure 4. Measurement shall be carried out at 200-250 volts after a charge lasting for 60 seconds and measurements shall be repeated after reversing the direction of the current. G.4.3 In case of test specimen immersed in distilled water it shall be ensured that the sole plates before being tested on removal from water shall be wiped off with a dry cloth or blotting paper so that no apparent trace of water remains, especially in the grooves. G.5 -Report G.5.1 All the Individual test value before as well as after immersion under water shall be reported and should meet the minimum requirement laid down before and after reversal of current. 
APPENDIX- H (IRST-55-~~2023~~ 2025) **SECANT STIFFNESS TEST** H.1 Place the test pad between steel platens, as shown in Figure1. A piece of '0' number emery paper shall be placed between the pad and the platens, with the abrasive side against the pad.	Nil	No Change proposed	**APPENDIX- H** (IRST-55-2025) **SECANT STIFFNESS TEST** H.1 Place the test pad between steel platens, as shown in Figure1. A piece of '0' number emery paper shall be placed between the pad and the platens, with the abrasive side against the pad.

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
 Figure 1 H.2 Apply consecutive loading of 100 KN at a rate of 50± 10 KN/min and remove it, six times. The loading times at 100 KN shall each be at least 12 seconds. H.3 Upon release of the final pre-conditioning deformation a pre-load up to 100N shall be applied before setting deflection measuring devices to zero. H.4 Apply a compressive force up to 100 KN at a rate of 50 ± 10 KN/min. As the load increases, record continuously the displacement at the four corners. From this record, determine the displacements with applied loads of 20 KN and 90 KN. If the difference between the largest and smallest of the four displacement measurements is more than 30% of the mean value, the test results are invalid, and the test must be repeated, ensuring that the pad is suitably placed in the test machine. If the difference is less than 30% of the mean, calculate the mean displacement, S_{20}, with 20 KN applied, and the mean displacement, S_{90}, with 90 KN applied. For used pads drawn from service, this difference shall be considered as 40%, max. H.5 Two number samples to be tested per lot and each individual value shall meet the requirement of the specification. H.6 The static secant stiffness, $k_{20\text{-}90}$, is calculated from $k_{20\text{-}90} = 70/(S_{90} - S_{20})$ KN/mm			 Figure 1 H.2 Apply consecutive loading of 100 KN at a rate of 50± 10 KN/min and remove it, six times. The loading times at 100 KN shall each be at least 12 seconds. H.3 Upon release of the final pre-conditioning deformation a pre-load up to 100N shall be applied before setting deflection measuring devices to zero. H.4 Apply a compressive force up to 100 KN at a rate of 50 ± 10 KN/min. As the load increases, record continuously the displacement at the four corners. From this record, determine the displacements with applied loads of 20 KN and 90 KN. If the difference between the largest and smallest of the four displacement measurements is more than 30% of the mean value, the test results are invalid, and the test must be repeated, ensuring that the pad is suitably placed in the test machine. If the difference is less than 30% of the mean, calculate the mean displacement, S_{20}, with 20 KN applied, and the mean displacement, S_{90}, with 90 KN applied. For used pads drawn from service, this difference shall be considered as 40%, max. H.5 Two number samples to be tested per lot and each individual value shall meet the requirement of the specification. H.6 The static secant stiffness, $k_{20\text{-}90}$, is calculated from $k_{20\text{-}90} = 70/(S_{90} - S_{20})$ KN/mm

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
APPENDIX –I (IRST-55-~~2023~~ 2025) **IMPACT ATTENUATION TEST** I.1 The impact attenuation of the pad is to be measured in a drop weight test rig of the type shown in Figure 2. The drop weight has a mass of between 10 kg and 50 kg. In order to set the calibration of the rig, the rail fastening should first be assembled with 6mm thick plain hard plastic rail pad(HDPE or EVA), with stiffness not less than 750MN/m. The mass and height of the drop weight should be adjusted so that a clear impulse signal is obtained in the strain gauge, within 2 milliseconds and 5 milliseconds, with the peak strain not exceeding 2/3 of the initial cracking strain of the sleeper. Once these parameters are established for a particular test rig, a new sleeper should be strain gauged and installed for regular testing.  Figure 2 I.2 Test Facility: I.2.1 For test of CGRSP 6.2mm thick or GRSP 6mm thick: Standard rail fastening components corresponding to concrete sleeper to Drg. No. RDSO/T-2495 or RDSO/T-2496 are to be used. I.2.2 For test of CGRSP 10mm thick or GRSP 10 mm thick: Standard rail fastening components corresponding to concrete sleeper to Drg. No. RDSO/T-7008 or RDSO/T-8527 or	Nil	No Change proposed	**APPENDIX –I** (IRST-55-2025) **IMPACT ATTENUATION TEST** I.1 The impact attenuation of the pad is to be measured in a drop weight test rig of the type shown in Figure 2. The drop weight has a mass of between 10 kg and 50 kg. In order to set the calibration of the rig, the rail fastening should first be assembled with 6mm thick plain hard plastic rail pad(HDPE or EVA), with stiffness not less than 750MN/m. The mass and height of the drop weight should be adjusted so that a clear impulse signal is obtained in the strain gauge, within 2 milliseconds and 5 milliseconds, with the peak strain not exceeding 2/3 of the initial cracking strain of the sleeper. Once these parameters are established for a particular test rig, a new sleeper should be strain gauged and installed for regular testing.  Figure 2 I.2 Test Facility: I.2.1 For test of CGRSP 6.2mm thick or GRSP 6mm thick: Standard rail fastening components corresponding to concrete sleeper to Drg. No. RDSO/T-2495 or RDSO/T-2496 are to be used.

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
RDSO/T-8746 or any relevant sleepers are to be used. I.3The test is carried out as follows: I.3.1 Place a Bed of stone/rubber mat below the sleeper for support. The support shall permit a vertical deflection in the range 0.1mm to 0.5mm during the test. I.3.2 With a hard plastic pad (stiffness greater than 750 MN/m) in place in the rail fastening assembly, drop the weight from the height established in the preparatory test, record the peak strain value. Repeat the test twice more. The average value of the three strains is recoded as $\xi_{ref.}$ I.3.3 Dismantle the rail fastening assembly, and re-assemble it with the test pad in place. Drop the weight from the same height and record the peak strain value. Repeat the test twice more. The average of these three peak strains is recorded as $\xi_{test.}$ I.4 The impact attenuation of the pad A is defined by $A = (1 - \xi_{test} / \xi_{ref}) \times 100\%$ I.5 Two samples shall be tested and each individual value shall meet the requirement of the specification.			I.2.2 For test of CGRSP 10mm thick or GRSP 10 mm thick: Standard rail fastening components corresponding to concrete sleeper to Drg. No. RDSO/T-7008 or RDSO/T-8527 or RDSO/T-8746 or any relevant sleepers are to be used. I.3The test is carried out as follows: I.3.1 Place a Bed of stone/rubber mat below the sleeper for support. The support shall permit a vertical deflection in the range 0.1mm to 0.5mm during the test. I.3.2 With a hard plastic pad (stiffness greater than 750 MN/m) in place in the rail fastening assembly, drop the weight from the height established in the preparatory test, record the peak strain value. Repeat the test twice more. The average value of the three strains is recoded as $\xi_{ref.}$ I.3.3 Dismantle the rail fastening assembly, and re-assemble it with the test pad in place. Drop the weight from the same height and record the peak strain value. Repeat the test twice more. The average of these three peak strains is recorded as $\xi_{test.}$ I.4 The impact attenuation of the pad A is defined by $A = (1 - \xi_{test} / \xi_{ref}) \times 100\%$ I.5 Two samples shall be tested and each individual value shall meet the requirement of the specification.
APPENDIX –J (IRST-55-~~2023~~ 2025) **ADHESION STRENGTH TEST**	Nil	No Change proposed	**APPENDIX –J** (IRST-55-2025) **ADHESION STRENGTH TEST**

<table>
<tr><th>Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)</th><th>Comments of Stake holders</th><th>RDSO's Remarks</th><th>Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)</th></tr>
<tr><td>The adhesion strength test between layers 'A' & 'B' of Composite GRSP shall be done with specimen of 20±1mm width cut from the Composite Grooved Rubber Sole Plate.

A layer is to be separated for a distance sufficient to enable the separated ends to be held in the grips of the tensile testing machine.

Sometimes, the layers are not distinctly visible and this separation is not possible due to strong adhesion between the layers 'A' & 'B' to enable gripping of the samples in the machine, in that case, the sample shall be treated as passing the adhesion strength test and the same should be reported as 'no separation' without giving any observed value of load required to separated the layers.

But, when the layers are distinctly visible and separation is possible, the maximum load for 20mm width shall be reported at which separation occurs.

Two numbers of samples shall be tested per lot and each individual value shall meet the requirement of the specification.</td><td></td><td></td><td>The adhesion strength test between layers 'A' & 'B' of Composite GRSP shall be done with specimen of 20±1mm width cut from the Composite Grooved Rubber Sole Plate.

A layer is to be separated for a distance sufficient to enable the separated ends to be held in the grips of the tensile testing machine.

Sometimes, the layers are not distinctly visible and this separation is not possible due to strong adhesion between the layers 'A' & 'B' to enable gripping of the samples in the machine, in that case, the sample shall be treated as passing the adhesion strength test and the same should be reported as 'no separation' without giving any observed value of load required to separated the layers.

But, when the layers are distinctly visible and separation is possible, the maximum load for 20mm width shall be reported at which separation occurs.

Two numbers of samples shall be tested per lot and each individual value shall meet the requirement of the specification.</td></tr>
<tr><td>(Proposed New Test)
APPENDIX –'K'
(IRST-55-2025)
<u>INCLINED REPEATED LOAD TEST (DURABILITY TEST)</u>

K1. For conducting durability test, following standard rail fastening assembly are to be used:

<table>
<tr><th>SN</th><th>Components</th><th>PSC sleeper RT-2496</th><th>Wider PSC sleeper RT-8746</th></tr>
<tr><td>1.</td><td>Rail</td><td>60kg</td><td>60kg</td></tr>
<tr><td>2.</td><td>GFN/HVN</td><td>RT-3706</td><td>RT-8751</td></tr>
</table>
</td><td>1.M/s Bony Polymers pvt.Ltd.:
The application of vertical load (? = V) and Lateral load (?=L) in a dynamic process that is not clear from the picture. Force application directions are more clearly needed by separate Drawing to make the correct fixture.</td><td>The vertical load and Lateral load have already been given in this appendix.</td><td>(Proposed New Test)
APPENDIX –'K'
(IRST-55-2025)
INCLINED REPEATED LOAD TEST (DURABILITY TEST)

K1. For conducting durability test, following standard rail fastening assembly are to be used:

SN Components PSC sleeper RT-2496 Wider PSC sleeper RT-8746
1. Rail 60kg 60kg</td></tr>
</table>

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)

	Liner		
3.	Rubber Pad	RT-6618	RT-8747
4.	ERC	RT-5919	RT-5919

K2. **Scale of loading:**

0.5 Million cycle at frequency of 300 cycles/minute
(L/V ratio = 0.62)

Vertical load (V) = 9.375t max^m to 0.5t min^m
Lateral load (V) = 5.81t max^m to 0.3t min^m

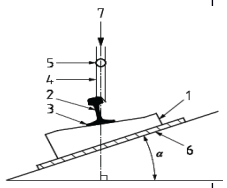
K3. Following tests shall be carried out initially and after completion of the accelerated durability test.

i) Load deflection
ii) Secant stiffness
iii) Impact Attenuation
iv) Thickness

K4. The change in values of Load deflection, Secant stiffness and impact attenuation measured after 0.5 million cycles test should be within 10% of the values measured at the beginning of the test. Reduction in the thickness shall not be more than 0.1mm.

K5. There should be no significant tears or holes in the pad after completion of the test.

Key
1. Sleeper, half sleeper or block
2. Short length of rail of the required section
3. Fastening assembly with appropriate pad
4. Loading mechanism which allows free rotation of rail under load
5. Free pivot either above or below the actuator with minimum length of strut from pivot to rail of 0.4m
6. Layer of crushable or conformable material on rigid support (e.g. gypsum board)



2.	GFN/HVN Liner	RT-3706	RT-8751
3.	Rubber Pad	RT-6618	RT-8747
4.	ERC	RT-5919	RT-5919

K2. Scale of loading:

0.5 Million cycle at frequency of 300 cycles/minute
(L/V ratio = 0.62)

Vertical load (V) = 9.375t maxm to 0.5t minm
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K3. Following tests shall be carried out initially and after completion of the accelerated durability test.

i) Load deflection
ii) Secant stiffness
iii) Impact Attenuation
iv) Thickness

K4. The change in values of Load deflection, Secant stiffness and impact attenuation measured after 0.5 million cycles test should be within 10% of the values measured at the beginning of the test. Reduction in the thickness shall not be more than 0.1mm.

K5. There should be no significant tears or holes in the pad after completion of the test.

Key
1. Sleeper, half sleeper or block
2. Short length of rail of the required section
3. Fastening assembly with appropriate pad
4. Loading mechanism which allows free rotation of rail under load
5. Free pivot either above or below the actuator with minimum length of strut from pivot to rail of 0.4m
6. Layer of crushable or conformable material

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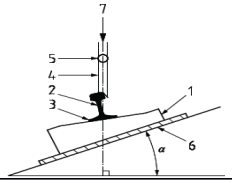
7. Angle α=32°			on rigid support (e.g. gypsum board) 7. Angle α=32° 
(Proposed New Test) **APPENDIX –'L'** (IRST-55-2025) **DETERMINATION OF RESILIENCE BY VERTICAL REBOUND** L1. **Number of test samples:** Three pads shall be considered for rubber property- Resilience by Vertical Rebound. L2. **Test temperature:** 27±2°C L3. **Test Specimen:** 12.5±0.5mm thick and 50mm diameter disc or minimum 50X50mm square/ rectangular test piece (As per specification) L4. **Procedure:** A hollow plunger of 28±0.5gm. weight and specified size is dropped on the sample through a guiding rod passing through hole of the plunger from height of 400mm. the top of the plunger is kept at 400 mm height. The 400 mm scale is divided into 100 equal divisions of 4mm each. The scale is also adjustable on a rigid support. The scale is allowed to rest on the sample. Plunger is dropped (with a spring release mechanism) on allowed to rest on the sample and rebound height of top of the plunger is noted for 4th, 5th, & 6th impacts in terms of divisions which directly give % resilience. First 3 impacts are for conditioning of the sample. L5. **Report :** Report average % resilience recorded for 4th, 5th, & 6th impacts each sample.	Nil	No Change proposed	**(Proposed New Test)** **APPENDIX –'L'** (IRST-55-2025) **DETERMINATION OF RESILIENCE BY VERTICAL REBOUND** L1. **Number of test samples:** Three pads shall be considered for rubber property- Resilience by Vertical Rebound. L2. **Test temperature:** 27±2°C L3. **Test Specimen:** 12.5±0.5mm thick and 50mm diameter disc or minimum 50X50mm square/ rectangular test piece (As per specification) L4. **Procedure:** A hollow plunger of 28±0.5gm. weight and specified size is dropped on the sample through a guiding rod passing through hole of the plunger from height of 400mm. the top of the plunger is kept at 400 mm height. The 400 mm scale is divided into 100 equal divisions of 4mm each. The scale is also adjustable on a rigid support. The scale is allowed to rest on the sample. Plunger is dropped (with a spring release mechanism) on allowed to rest on the sample and rebound height of top of the plunger is noted for 4th, 5th, & 6th impacts in terms of divisions which directly give % resilience. First 3 impacts are for conditioning of the sample.

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<tr><td>Note: For screening of samples for pass or fail purpose one opaque shield may be placed below desired resilience mark. If on the rebound, the top of the plunger is seen, the sample shall be considered as pass.</td><td></td><td></td><td>L5. Report :
Report average % resilience recorded for 4th, 5th, & 6th impacts each sample.

Note: For screening of samples for pass or fail purpose one opaque shield may be placed below desired resilience mark. If on the rebound, the top of the plunger is seen, the sample shall be considered as pass.</td></tr>
<tr><td>APPENDIX-'N M'

(IRST-55-20232025)

<u>WEIGHT OF DIFFERENT RAIL PAD</u>

<table>
<tr><th>Drawing No.</th><th>Type of Rail pad</th><th>Maximum weight of Rail Pad (g)</th></tr>
<tr><td>1</td><td>2</td><td>3</td></tr>
<tr><td>RDSO/T-3703</td><td>6mm GRSP</td><td>161</td></tr>
<tr><td>RDSO/T-3711</td><td>6mm GRSP</td><td>174</td></tr>
<tr><td>RDSO/T-6618</td><td>6.2mm CGRSP</td><td>167</td></tr>
<tr><td>RDSO/T-8327</td><td>6.2mm CGRSP</td><td>154</td></tr>
<tr><td>RDSO/T-8528</td><td>10mm CGRSP</td><td>445</td></tr>
<tr><td>RDSO/T-8747</td><td>10mm CGRSP</td><td>425</td></tr>
</table>
Note: Only the weights of above mentioned Rail Pads shall be checked as mentioned in para 11.3.3.</td><td>Nil</td><td>No Change proposed</td><td>APPENDIX-'N M'

(IRST-55- 20232025)

<u>WEIGHT OF DIFFERENT RAIL PAD</u>

<table>
<tr><th>Drawing No.</th><th>Type of Rail pad</th><th>Maximum weight of Rail Pad (g)</th></tr>
<tr><td>1</td><td>2</td><td>3</td></tr>
<tr><td>RDSO/T-3703</td><td>6mm GRSP</td><td>161</td></tr>
<tr><td>RDSO/T-3711</td><td>6mm GRSP</td><td>174</td></tr>
<tr><td>RDSO/T-6618</td><td>6.2mm CGRSP</td><td>167</td></tr>
<tr><td>RDSO/T-8327</td><td>6.2mm CGRSP</td><td>154</td></tr>
<tr><td>RDSO/T-8528</td><td>10mm CGRSP</td><td>445</td></tr>
<tr><td>RDSO/T-8747</td><td>10mm CGRSP</td><td>425</td></tr>
</table>
Note: Only the weights of above mentioned Rail Pads shall be checked as mentioned in para 11.3.3.</td></tr>
<tr><td><u>APPENDIX-'O' 'N'</u></td><td>Nil</td><td>No Change</td><td><u>APPENDIX-'O' 'N'</u></td></tr>
</table>

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
(IRST-55-~~2023~~ 2025) **DOUBLE SAMPLING PLAN** General Inspection Level-II (Refer: Table I & 3A of IS 2500 Part I – 2000)		proposed	(IRST-55-~~2023~~ 2025) **DOUBLE SAMPLING PLAN** General Inspection Level-II (Refer: Table I & 3A of IS 2500 Part I – 2000)

Lot size	Sample size code letter	Sample	Sample size	Cumulative sample	Accepted quality level Percent defectives-2.5	
					Acceptance No. (a)	Rejection No. (r)
281-500	H	First	32	32	1	3
		Second	32	64	4	5
501-1200	J	First	50	50	2	5
		Second	50	100	6	7
1201-3200	K	First	80	80	3	6
		Second	80	160	9	10
3201-10000	L	First	125	125	5	9
		Second	125	250	12	13

Notes:

(i) For any other lot size less than 281, reference may be made to table I & 3-A of IS-2500 (Part I)-2000 for sample size, acceptance and rejection numbers.

(ii) In the first sample if the number of failed pieces is equal to the acceptance number (a), the lot shall be accepted. If number of failed pieces is equal to or more than rejection number (r), the lot shall be rejected.

(iii) If the failed pieces exceeds the acceptance number (a), but less than the rejection number (r), the second sample should be considered.

(iv) If the cumulative failed pieces equal or exceed the rejection number (r), the lot shall be rejected. The cumulative failed pieces are the total number of failed pieces in the first and second

Lot size	Sample size code letter	Sample	Sample size	Cumulative sample	Accepted quality level Percent defectives-2.5	
					Acceptance No. (a)	Rejection No. (r)
281-500	H	First	32	32	1	3
		Second	32	64	4	5
501-1200	J	First	50	50	2	5
		Second	50	100	6	7
1201-3200	K	First	80	80	3	6
		Second	80	160	9	10
3201-10000	L	First	125	125	5	9
		Second	125	250	12	13

Notes:

(i) For any other lot size less than 281, reference may be made to table I & 3-A of IS-2500 (Part I)-2000 for sample size, acceptance and rejection numbers.

(ii) In the first sample if the number of failed pieces is equal to the acceptance number (a), the lot shall be accepted. If number of failed pieces is equal to or more than rejection number (r), the lot shall be rejected.

(iii) If the failed pieces exceeds the acceptance number (a), but less than the rejection number (r), the second sample should be considered.

(iv) If the cumulative failed pieces equal or exceed the rejection number (r), the lot shall be rejected. The cumulative failed pieces are the total number of failed pieces in the first and second samples.

<table>
<tr><th>Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)</th><th>Comments of Stake holders</th><th>RDSO's Remarks</th><th>Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)</th></tr>
<tr><td>samples.</td><td></td><td></td><td></td></tr>
<tr><td>

APPENDIX 'K' 'O'
(IRST-55-~~2023~~2025)

SCHEME OF TESTING FOR PRE-ACCEPTANCE/ ACCEPTANCE TESTS FOR RAIL PADS

<table>
<tr><th>SN</th><th>Property</th><th>No of samples to be tested</th><th>Criteria value for acceptance/ rejection</th><th>No. of samples to be drawn</th></tr>
<tr><td>1</td><td>Hardness shore 'A'</td><td>5</td><td>Individual</td><td>5</td></tr>
<tr><td>2</td><td colspan="4">Tensile strength (Kg/cm2)</td></tr>
<tr><td></td><td>(a) Before ageing</td><td>5</td><td>Individual</td><td>5</td></tr>
<tr><td></td><td>b) After ageing at 100+ 1°C for 96 + 0/-2 hours</td><td></td><td></td><td></td></tr>
<tr><td></td><td>(c) Retention after ageing (%),</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>3</td><td colspan="4">Elongation at break (%)</td></tr>
<tr><td></td><td>(a) Before ageing</td><td>5</td><td>Individual</td><td>5</td></tr>
<tr><td></td><td>(b) After ageing at 100 + 1°C for 96+ 0/-2 hours</td><td></td><td></td><td></td></tr>
<tr><td></td><td>(c) Retention after ageing (%)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>4</td><td colspan="4">Modulus (relaxed) at 100% elongation</td></tr>
<tr><td></td><td>(a) Before ageing (kg/cm2)</td><td>3</td><td>Individual</td><td>3</td></tr>
<tr><td></td><td>b) Change after ageing at100 + 1oC for 96+ 0/-2 hours</td><td></td><td></td><td></td></tr>
<tr><td>5</td><td>Compression set subjected to 50% compression at 100+ 1oC for 24+ 0/-2 hours</td><td>3</td><td>Individual</td><td>3</td></tr>
<tr><td>6</td><td>Tension set subjected to 50% stretch at 100 + 1oC for 24 + 0/-2 hours</td><td>3</td><td>Individual</td><td>3</td></tr>
</table>

</td><td>

1.Ameenji Industries :
2.M/s Shri Radha Polymers:
This test is already mentioned in the Specification .Sl.No. 14

3.M/s ROYAL FASTENERS NE:
Clause 16 regarding Breaking load test on Nylon Cord Reinforced GRSP is a repetition
of Sl. No. 14 and can be omitted.

4. Patil Rail Infrastructure Pvt.Ltd.:

Addition of Flex Property
-2-Individual-2

</td><td>

The comments of the firm are acceptable and Annexure has been modified.

</td><td>

APPENDIX 'K' 'O'
(IRST-55-~~2023~~2025)

SCHEME OF TESTING FOR PRE-ACCEPTANCE/ ACCEPTANCE TESTS FOR RAIL PADS

<table>
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<tr><td>(c) Retention after ageing (%),</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="4">Elongation at break (%)</td></tr>
<tr><td>(a) Before ageing</td><td>5</td><td>Individual</td><td>5</td></tr>
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<tr><td>(c) Retention after ageing (%)</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td colspan="4">Modulus (relaxed) at 100% elongation</td></tr>
<tr><td>(a) Before ageing (kg/cm2)</td><td>3</td><td>Individual</td><td>3</td></tr>
</table>

</td></tr>
</table>

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)

7	Load - Compression test	2	Individual	2
8	Electrical resistance test			
	On normal Rail Pad	2	Individual	2
	On Rail Pad after immersion in distilled water for 48 hours			
9	Secant stiffness Test	2	Individual	2
10	Impact Attenuation Test	2	Individual	2
11	Dimensional check	8	Individual	8
12	Adhesion Test	2	Individual	2
13	Adhesion between the Nylon Cord and Rubber	2	Individual	2
14	Breaking load	5	Individual	5
15	Weight Test	8	Individual	8
16	Breaking load test on Nylon cord Reinforced GRSP	5	Individual	5

Note:

1. In case of acceptance tests for dimensional check number of samples to be tested shall be as per Clause 11.2.
2. In case of acceptance tests for weight test number of samples to be tested shall be as per Clause 11.3.3.
3. The tests shall be conducted as per relevant test method of the property as given in the specification.
4. Specimen for tests before and after ageing are to be prepared from the same pads.
5. Samples shall be signed by the firm's representative and the inspecting officer drawing the samples.
6. All samples shall be free from surface defects and shall bear marking as per requirement of relevant drawing.
7. Electrical resistance tests are to be conducted on same pads before and after immersion in water.
8. Total no. of samples per lot required for physical tests shall be:

(i) 25 nos. of finished pads as per relevant drawing.
(ii) 3 Nos. for load-compression test of. Size 200mm x 130mm.

b) Change after ageing at100 + 1oC for 96+ 0/-2 hours			
Compression set subjected to 50% compression at 100+ 1oC for 24+ 0/-2 hours	3	Individual	3
Tension set subjected to 50% stretch at 100 + 1oC for 24 + 0/-2 hours	3	Individual	3
Load - Compression test	2	Individual	2
Electrical resistance test			
On normal Rail Pad	2	individual	2
On Rail Pad after immersion in distilled water for 48 hours			
Secant stiffness Test	2	individual	2

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)

Impact Attenuation Test	2	individual	2
Dimensional check	8	Individual	8
Adhesion Test	2	Individual	2
Adhesion between the Nylon Cord and Rubber	2	Individual	2
Breaking load test on Nylon cord Reinforced GRSP	5	Individual	5
Weight Test	8	Individual	8
Thermogravimetric Analysis (TGA)	1	Individual	1
Durability Test)	1	Individual	1
Vertical Rebound	3	Individual	3
Ozone test	1	Individual	1
Abrasion Test	1	Individual	1

Note:

1. In case of acceptance tests for dimensional

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
			check number of samples to be tested shall be as per Clause 11.2. **2.** In case of acceptance tests for weight test number of samples to be tested shall be as per Clause 11.3.3. **3.** The tests shall be conducted as per relevant test method of the property as given in the specification. **4.** Specimen for tests before and after ageing are to be prepared from the same pads. **5.** Samples shall be signed by the firm's representative and the inspecting officer drawing the samples. **6.** All samples shall be free from surface defects and shall bear marking as per requirement of relevant drawing. **7.** Electrical resistance tests are to be conducted on same pads before and after immersion in water. **8.** Total no. of samples per lot required for physical tests shall be: i) 25 nos. of finished pads as per relevant drawing. ii) 3 Nos. for load-compression test of. Size 200mm x 130mm.
APPENDIX-'~~L~~' 'P' (IRST-55- ~~2023~~ 2025) Letter of offer from the firm To, (Address of inspecting agency) Sub: Call Letter for inspection of _____ to drg. No. RDSO/T- Ref: _____Railway/Railway Board P.O. No-_____ for _____ to Drg. No-RDSO/T- * * * The ……as per following details are offered for inspection in terms of the above referred purchase order. These have been internally checked and found satisfactory as per drawing No.	Nil	No Change proposed	**APPENDIX-'~~L~~' 'P'** (IRST-55- ~~2023~~ 2025) Letter of offer from the firm To, (Address of inspecting agency) Sub: Call Letter for inspection of _____ to drg. No. RDSO/T- Ref: _____Railway/Railway Board P.O. No-_____ for _____ to Drg. No- RDSO/T- * * * The ……as per following details are offered for inspection in terms of the above referred purchase order. These have been internally

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
RDSO/T.....and relevant IRS specification (copy of test report enclosed). 1. Installment No. 2. Quantity on order a) Against original order b) Against extension 3. Quantity previously inspected and passed 4. Quantity now offered for inspection a) Against original order b) Against extension 5. Batch Nos. 6. Rate Per..... 7. Marking on..... 8. Delivery period..... 9. a) Original..... b) Extended..... c) Letter No (for extension) 10. Consignee 11. Packing Yours faithfully,			checked and found satisfactory as per drawing No. RDSO/T.....and relevant IRS specification (copy of test report enclosed). 1. Installment No. 2. Quantity on order a) Against original order b) Against extension 3. Quantity previously inspected and passed 4. Quantity now offered for inspection a) Against original order b) Against extension 5. Batch Nos. 12. Rate Per..... 13. Marking on..... 14. Delivery period..... 15. a) Original..... b) Extended..... c) Letter No (for extension) 16. Consignee 17. Packing Yours faithfully,
APPENDIX-'~~M~~ Q' (IRST-55- ~~2023~~2025) **STORAGE OF RAIL PAD** The rubbers whether under storage or in use continue to deteriorate and ultimately may become unserviceable. The deterioration may be the result of one particular factor or a combination of factors viz. the action of oxygen, ozone, light, heat, humidity etc. The deleterious effects of these factors may, however, be minimised by adopting appropriate conditions	Nil	No Change proposed	**APPENDIX-'~~M~~ Q'** (IRST-55- ~~2023~~2025) **STORAGE OF RAIL PAD** The rubbers whether under storage or in use continue to deteriorate and ultimately may become unserviceable. The deterioration may be the result of one particular factor or a combination of factors viz. the action of oxygen, ozone, light, heat, humidity etc. The deleterious effects of

Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023 (Revision- 01)	Comments of Stake holders	RDSO's Remarks	Final Draft IRS Specification for Rail pad for placing beneath rails, Serial No. T- 55-2023(Revision- 01)
of storing and duration of storage. This guide line proves suitable conditions for the storage of rubbers in all forms. (i) The rubber components should be stored in a cool place as far as practicable, preferably below 30 deg.C. (ii) They should be kept away from direct sunlight preferably in a dark place. Direct sunlight causes much faster degradation of the rubber components. (iii) The humidity of the storage condition should not be such that condensation of moisture takes place on the surface of the components. (iv) In the vicinity of these components, any loose electrical connections should be avoided, as these cause production of ozone, which adversely affects rubber. (v) They should be stored away from contact with materials containing copper and manganese, which act as poisoning agents and resulting in their faster degradation. (vi) Under no circumstances rubber components should be stressed during storage. The portion under stress undergoes deformation with permanent set and loading o degradation. They should be stacked in such a way so that any super imposed stresses are substantially avoided. (vii) Any contact with grease or oil should be avoided as these cause swelling, softening and deterioration of rubbers. (viii) French chalk or soapstone or mica should liberally be applied on the surface of rubber components. (ix) Great care is to be exercised so that the material is used in the order of their receipt in the stores i.e. 'first-come-first issue basis'. The rubbers whether under storage or in use continue to deteriorate. The only difference is that under service condition, deterioration is much faster. Every moment of storing is at the cost of useful life and prolonged storage of the material may render it			these factors may, however, be minimised by adopting appropriate conditions of storing and duration of storage. This guide line proves suitable conditions for the storage of rubbers in all forms. (ii) The rubber components should be stored in a cool place as far as practicable, preferably below 30 deg.C. (ii) They should be kept away from direct sunlight preferably in a dark place. Direct sunlight causes much faster degradation of the rubber components. (iii) The humidity of the storage condition should not be such that condensation of moisture takes place on the surface of the components. (iv) In the vicinity of these components, any loose electrical connections should be avoided, as these cause production of ozone, which adversely affects rubber. (v) They should be stored away from contact with materials containing copper and manganese, which act as poisoning agents and resulting in their faster degradation. (vi) Under no circumstances rubber components should be stressed during storage. The portion under stress undergoes deformation with permanent set and loading o degradation. They should be stacked in such a way so that any super imposed stresses are substantially avoided. (vii) Any contact with grease or oil should be avoided as these cause swelling, softening and deterioration of rubbers.

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unserviceable due to progressive deterioration.			(viii) French chalk or soapstone or mica should liberally be applied on the surface of rubber components. (ix) Great care is to be exercised so that the material is used in the order of their receipt in the stores i.e. 'first-come-first issue basis'. The rubbers whether under storage or in use continue to deteriorate. The only difference is that under service condition, deterioration is much faster. Every moment of storing is at the cost of useful life and prolonged storage of the material may render it unserviceable due to progressive deterioration.
APPENDIX-'~~P~~' 'R' **(IRST-55-~~2023~~ 2025)** **TESTING OF SAMPLES FROM THE LOTS ALREADY PASSED BY INSPECTING OFFICIAL/AGENCY AT THE VENDOR PREMISES / CONSIGNEE END/FIELD AND DEFECT CLASSIFICATION** ~~P.1~~ R.1 Procedure for Picking up samples from the lot already passed by inspecting official/agency in the vendor premises or from consignee end/field shall be as follows: ~~P.1.1~~R.1.1Representative(s) of RDSO, Zonal Railway, Railway Board or Railway investigating agency shall pick up samples jointly with the field unit's representative, in case the sample is picked up from the field units/consignee end, and with the firm's representative in case the sample is picked up at the firm's premises (after the LOT has been passed by the inspecting agency, but before dispatch). *In case, the firm does not cooperate in joint picking up of samples in firm premises, then a report is to be put up by Inspecting Railway Official to the Directorate head controlling the item at RDSO for penal action on the firm.* ~~P.1.2~~ R.1.2 Two *sample* sets (20nos. pads in each set) shall be picked up & sealed. 'FIRST' sample is for testing and	**APPENDIX- 'R'** **1.M/s Shah Elastomer:** **2. M/s Shiva Industries:** Over the years BIS specifications are incorporated in various IRS specification and testing methodology is adopted from the same. BIS specification is a standard specification having various provisions which should not be ignored or over-ride as these are followed in several products similar to rail pads. The time frame and percentage variation acceptable on different parameters mentioned in Appendix-R are vague and derived from nowhere having no basis. Whereas in BIS specification the time frame for testing is correctly mentioned for variable and constant parameters and followed since many years. So we suggest that the provisions of BIS should not over-ride with provisions of Appendix-R and Appendix-R should be modified	No change is proposed in this Annexure	**APPENDIX-'~~P~~' 'R'** **(IRST-55-~~2023~~ 2025)** **TESTING OF SAMPLES FROM THE LOTS ALREADY PASSED BY INSPECTING OFFICIAL/AGENCY AT THE VENDOR PREMISES / CONSIGNEE END/FIELD AND DEFECT CLASSIFICATION** ~~P.1~~ R.1 Procedure for Picking up samples from the lot already passed by inspecting official/agency in the vendor premises or from consignee end/field shall be as follows: ~~P.1.1~~R.1.1Representative(s) of RDSO, Zonal Railway, Railway Board or Railway investigating agency shall pick up samples jointly with the field unit's representative, in case the sample is picked up from the field units/consignee end, and with the firm's representative in case the sample is picked up at the firm's premises (after the LOT has been passed by the inspecting agency, but before dispatch). *In case, the firm does not cooperate in joint picking up of samples in firm premises, then a report is to be put up by Inspecting Railway*

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'SECOND' sample shall be 'Standby' sample. *The 'Standby' sample shall be kept in safe custody and sent to 'STANDBY SAMPLE STORE' at RDSO.* Testing of 'Standby sample' and action thereafter shall be governed by the extant provisions of ISO Apex documents. ~~P.2~~ R.2 Defect classification of samples tested from the lot already passed by inspecting official/agency in the vendor premises or from consignee end/field shall be as follows: ~~P.2.1~~R.2.1 For samples tested within 3 months of manufacture, any variation from specified acceptance values would be treated as a defect. ~~P.2.2~~R.2.2 For samples tested beyond 3 months but within 4 months of manufacture, variation beyond 2% of specified acceptance values of all physical parameters (except Ash content, specific gravity and Electrical Resistance) would be treated as defect. ~~P.2.3~~ R.2.3 For samples tested beyond 4 months but within 8 months of manufacture, variation beyond 6 % of specified acceptance values of all physical parameters (except Ash content, specific gravity and Electrical Resistance) would be treated as defect. ~~P.2.4~~R.2.4 For samples tested beyond 8 months but within 12 months of manufacture, variation beyond 10 % of specified acceptance values of all physical parameters (except Ash content, specific gravity and Electrical Resistance) would be treated as defect. ~~P.2.5~~ R.2.5 In case of Ash content, specific gravity and Electrical Resistance, no variation is permitted and any variation from specified acceptance values would be treated a defect irrespective of age of samples at the time of testing. ~~P.2.6~~ R.2.6 In case of hardness, value less than minimum specified value will be considered as a defect irrespective of age of samples at the time of testing. ~~P.3~~R.3 Action to be taken based on the test results shall be as follows: ~~P.3.1~~R.3.1 Defect in one physical parameter will not be considered as failure of the lot/set and no action shall be taken. However, for defect in Ash content or Specific Gravity or Electrical Resistance alone will be considered as failure of the lot/set and the lot shall be rejected and financial recovery shall be made.	accordingly. **<u>For Para R.1.1</u>** **1.M/s Shah Elastomers:** **2. M/s Shiva Industries:** The lot of rail pads is supplied only after it is being passed and inspected by the inspecting agency. We suggest that picking of samples should not be done vaguely and should be done only if there is a written complaint from field unit or consignee end or if failure is reported from the field like in the case of other railway items. If there is a need to super check the activities of inspecting agency, it can be done during the time of inspection and not by picking inspected and passed samples from consignee end or field units.		*Official to the Directorate head controlling the item at RDSO for penal action on the firm.* ~~P.1.2~~ R.1.2 Two *sample* sets (20nos. pads in each set) shall be picked up & sealed. 'FIRST' sample is for testing and 'SECOND' sample shall be 'Standby' sample. *The 'Standby' sample shall be kept in safe custody and sent to 'STANDBY SAMPLE STORE' at RDSO.* Testing of 'Standby sample' and action thereafter shall be governed by the extant provisions of ISO Apex documents. ~~P.2~~ R.2 Defect classification of samples tested from the lot already passed by inspecting official/agency in the vendor premises or from consignee end/field shall be as follows: ~~P.2.1~~R.2.1 For samples tested within 3 months of manufacture, any variation from specified acceptance values would be treated as a defect. ~~P.2.2~~R.2.2 For samples tested beyond 3 months but within 4 months of manufacture, variation beyond 2% of specified acceptance values of all physical parameters (except Ash content, specific gravity and Electrical Resistance) would be treated as defect. ~~P.2.3~~ R.2.3 For samples tested beyond 4 months but within 8 months of manufacture, variation beyond 6 % of specified acceptance values of all physical parameters (except Ash content, specific gravity and Electrical Resistance) would be treated as defect. ~~P.2.4~~R.2.4 For samples tested beyond 8 months but within 12 months of manufacture, variation beyond 10 % of specified acceptance values of all physical parameters (except Ash content, specific gravity and Electrical Resistance) would be treated as defect. ~~P.2.5~~ R.2.5 In case of Ash content, specific gravity and Electrical Resistance, no variation is permitted and any variation from specified acceptance values would be treated a defect

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~~P.3.2~~R.3.2 Defects in two physical parameters, it will be considered as failure of the lot/set and the lot shall be rejected and financial recovery shall be made. ~~P.3.3~~R.3.3 If there is defect in more than two physical parameters, the lots shall be rejected, financial recovery shall be done and further Penal action shall also be taken against the firm by RDSO. ~~P.3.4~~ R.3.4 In case of rejection of lot at consignee end/ field the material rejection advice/rejection memo should be sent by the consignee (or the authority carrying out inspection) to all concerned i.e. firm/supplier, purchaser, pre-inspecting agency, paying authority as per contract etc. without fail. ~~P.3.5~~ R.3.5 Financial Recovery- In case payment has been made to the firm for material, the concerned paying authority as per contract should note the rejection advice details in the recovery register for effecting recovery of payments made, as the case may be. ~~P.3.6~~ R.3.6 If the firm desires to have joint inspection, joint inspection of rejected material (only for parameters in which defect was found) will be held with previous inspecting agency and the firm. In case of failure of either of the two parties to associate with joint inspection, the inspection should be done by the consignee (or the authority carrying out inspection in the first instance) with the party comes for joint inspection. Irrespective of whether a party attends joint inspection or not, modality of joint inspection etc. will have to be completed within 21days of communication of rejection advice to the supplier. ~~P.3.7~~ R.3.7 After joint inspection, if the sample is passed in the parameters in which defect was found previously, then the lot shall be passed and no financial recovery or penal action shall be taken. ~~P.3.8~~R.3.8 After joint inspection, if the sample still fails even in any one of the parameters in which defect was found previously, then the lot shall be shall continue to be treated as rejected and financial recovery and penal action shall be taken as the case may be. ~~P.3.9~~ R.3.9 Test results of joint inspection shall be communicated by the consignee (or the authority carrying out inspection) to all concerned i.e. paying authority as per contract, firm/supplier, purchaser, pre-inspecting agency with necessary instructions regarding acceptance/rejection of lot,			irrespective of age of samples at the time of testing. ~~P.2.6~~ R.2.6 In case of hardness, value less than minimum specified value will be considered as a defect irrespective of age of samples at the time of testing. ~~P.3~~R.3 Action to be taken based on the test results shall be as follows: ~~P.3.1~~R.3.1 Defect in one physical parameter will not be considered as failure of the lot/set and no action shall be taken. However, for defect in Ash content or Specific Gravity or Electrical Resistance alone will be considered as failure of the lot/set and the lot shall be rejected and financial recovery shall be made. ~~P.3.2~~R.3.2 Defects in two physical parameters, it will be considered as failure of the lot/set and the lot shall be rejected and financial recovery shall be made. ~~P.3.3~~R.3.3 If there is defect in more than two physical parameters, the lots shall be rejected, financial recovery shall be done and further Penal action shall also be taken against the firm by RDSO. ~~P.3.4~~ R.3.4 In case of rejection of lot at consignee end/ field the material rejection advice/rejection memo should be sent by the consignee (or the authority carrying out inspection) to all concerned i.e. firm/supplier, purchaser, pre-inspecting agency, paying authority as per contract etc. without fail. ~~P.3.5~~ R.3.5 Financial Recovery- In case payment has been made to the firm for material, the concerned paying authority as per contract should note the rejection advice details in the recovery register for effecting recovery of payments made, as the case may be. ~~P.3.6~~ R.3.6 If the firm desires to have joint inspection, joint inspection of rejected material (only for parameters in which defect was found) will be held with previous inspecting agency and

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financial recovery and penal action. ~~P.3.10~~ R.3.10 In case, if both the parties don't turn up for joint inspection then no joint inspection can be done and action for rejection of lot, financial recovery and penal action shall continue ,as the case may be. ~~P.3.11~~ R.3.11 The supplier/firm may be permitted to collect the rejected lot/goods only after the firm has made the payments already made by Railway (if any) to the firm or equivalent amount has been recovered for this purpose. ~~P.3.12~~ R.3.12Penal action, if any, shall be taken as per the extant provisions of ISO Apex documents. ~~P.3.13~~R.3.13 In case of rejection of a lot is done, based on samples collected at vendor premises, no further joint inspection of rejected material will be done and action for rejection of lot, financial recovery or penal action shall be taken, as the case may be. ****			the firm. In case of failure of either of the two parties to associate with joint inspection, the inspection should be done by the consignee (or the authority carrying out inspection in the first instance) with the party comes for joint inspection. Irrespective of whether a party attends joint inspection or not, modality of joint inspection etc. will have to be completed within 21days of communication of rejection advice to the supplier. ~~P.3.7~~ R.3.7 After joint inspection, if the sample is passed in the parameters in which defect was found previously, then the lot shall be passed and no financial recovery or penal action shall be taken. ~~P.3.8~~R.3.8 After joint inspection, if the sample still fails even in any one of the parameters in which defect was found previously, then the lot shall be shall continue to be treated as rejected and financial recovery and penal action shall be taken as the case may be. ~~P.3.9~~ R.3.9 Test results of joint inspection shall be communicated by the consignee (or the authority carrying out inspection) to all concerned i.e. paying authority as per contract, firm/supplier, purchaser, pre-inspecting agency with necessary instructions regarding acceptance/rejection of lot, financial recovery and penal action. ~~P.3.10~~ R.3.10 In case, if both the parties don't turn up for joint inspection then no joint inspection can be done and action for rejection of lot, financial recovery and penal action shall continue ,as the case may be. ~~P.3.11~~ R.3.11 The supplier/firm may be permitted to collect the rejected lot/goods only after the firm has made the payments already made by Railway (if any) to the firm or equivalent amount has been recovered for this purpose. ~~P.3.12~~ R.3.12Penal action, if any, shall be taken as per the extant provisions of ISO Apex documents. ~~P.3.13~~R.3.13 In case of rejection of a lot is

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			done, based on samples collected at vendor premises, no further joint inspection of rejected material will be done and action for rejection of lot, financial recovery or penal action shall be taken, as the case may be. ****

Further, Comments of following firms are as under:

M/s Shri Radha Polymers: In continuation to the above, a meeting of all the concerned stake holders i e Vendors Representatives, Track Design and M&C Officials be called before finalizing the specifications and STR so that a proper discussion can be held taking into consideration all aspects and views from all the concerned people. We hope all the above comments will he considered positively, and a meeting as requested above be called for the same.

M/s Royal Fasteners NE: We reiterate our commitment to quality and compliance and propose a joint meeting with RDSO, vendors, and the Railway Board to deliberate these technical aspects collaboratively before finalizing the draft. We hope our suggestions will be considered constructively.

M/s Shiva Industries: In connection to the above, a meeting of all the concerned stake holders i.e Vendors Representatives, Track Design and M&C Officials be called before finalizing the specification and STR.So that a proper discussion can be held taking into consideration all aspects and views from all the concerned people. We hope all the above comments will be considered positively and a meeting as requested above the called for same.

M/s V K Enterprises: We therefore request you the following: a) Kindly furnish us the test results of study conducted by RDSO for finalizing these test results. b) Kindly call a meeting all the stakeholders including officials from Track Design Directorate, M&C Directorate, QA-Civil department and all the vendors, so as to ensure smooth implementation of this specification after clearing their doubts.

M/s Shah Elastomer: We would also be glad to attend a meeting called by you with all stakeholders, ROSD, etc, for a joint discussion regarding this specification

M/s Royal Elastomers : The proposed vacuum sealed packing is excessive. Regular corrugated box packing with higher ply rating is sufficient. Tumout sets are variable size of pads, so it cannot be clubbed together.

M/s Royal Elastomers : The Breaking Lead Test under Clause 16 duplicates an earlier clause and may be removed.

M/s Royal Elastomers: Lastly, we request you to organize a joint meeting with RDSO, Vendors, and Railway Board, before finalizing the draft.