REASONED DOCUMENT IN RESPONSE TO UPLOADED DRAFT IRS SPECIFICATION FOR GLASS FILLED NYLON-66 & HIGH VISCOUS NYLON-66 INSULATING LINERS, SI. NO.T-44-2023(THIRD REVISION)

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
	Document Title: **GLASS FILLED NYLON-66 & HIGH VISCOUS NYLON-66 INSULATING LINERS SERIAL NO. T - 44 - 2023 (Third Revision)**			
4.0	**4.1.2 Material for HVN Liner:** The material used for the manufacture of Insulating Liners shall be "High Viscosity Nylon 66". The Colour scheme shall be as specified in RAL colour standard mentioned in this clause or otherwise mentioned in the relevant drawing. Regenerated / reconstituted material shall not be used for the manufacture of liners. The manufacturer of HVN liner shall have a valid tie-up in the form of a written Memorandum of Understanding (MOU)/Contract with Primary raw material manufacturer for "Nylon 66 (HVN-66)", covering raw material supplies and technical support including quality control. The manufacturer of the HVN insulating liners shall only mould the liners out of the material supplied to them by the primary manufacturer. Note: i. Primary raw material manufacturer can have a valid MOU/Contract with one or more manufacturers of HVN liners or vice versa ii. A Primary raw material manufacturer should mandatorily have facility of polymerization plant to manufacture HVN 66 material starting from the precursor materials like Hexa Methylene Diamine (HMD) and / or Adipo Nitrile (ADN) The credentials of primary raw material manufacturer should be clearly mentioned in the MoU/Contract and following should include. a) Declaration that they are the primary raw material manufacture as defined above b) Grade of raw material being supplied along with its data sheet.	**4.1.2 Material for HVN Liner:** The material used for the manufacture of Insulating Liners shall be "High Viscosity Nylon 66". The Colour scheme shall be as specified in RAL colour standard mentioned in this clause or otherwise mentioned in the relevant drawing. Regenerated / reconstituted material shall not be used for the manufacture of liners. The manufacturer of HVN liner shall have a valid tie-up in the form of a written Memorandum of Understanding (MOU)/Contract with Primary raw material manufacturer for "Nylon 66 (HVN-66)", covering raw material supplies and technical support including quality control. The manufacturer of the HVN insulating liners shall only mould the liners out of the material supplied to them by the primary manufacturer. Note: i. Primary raw material manufacturer can have a valid MOU/Contract with one or more manufacturers of HVN liners or vice versa ii. A Primary raw material manufacturer should mandatorily have facility of polymerization plant to manufacture HVN 66 material starting from the precursor materials like Hexa Methylene Diamine (HMD) and / or Adipo Nitrile (ADN) The credentials of primary raw material manufacturer should be clearly mentioned in the MoU/Contract and following should include. a) Declaration that they are the primary raw material manufacture as defined	**1. M/s Sheth & Co., Mumbai:** **ii)** Primary raw material should have their own polymerization facility This clause may be exempted for an Indian manufacturer who wants to setup SSP plant in India. He may be allowed to put up a SSP plant if he has valid tie-up for supplies of base polymer of Polyamide 6.6. This clause restricts any manufacturer other than primary manufacturer to put up a SSP plant in India. SSP plant is the first step in setting up the	HVN-66 is a new material for IR, therefore, procurement of the raw material has been restricted through the Primary raw material manufacturer who have the facility of polymerization plant to manufacture HVN 66 material starting from the precursor materials like Hexa Methylene Diamine (HMD) and / or Adipo Nitrile (AND). ***After adequate experience about the raw material the clause may be reviewed***. Further, 'Primary Raw Material Manufacturer' have to apprise Indian Railways about their future localization plan of HVN PA-66 resin manufacturing in India under 'Make-in-India' policy. **Hence, suggestion is not accepted.** HVN liner is open for any interested vendor willing to supply of HVN liner in IR. It is true that the RDSO approved / developmental

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		above b) Grade of raw material being supplied along with its data sheet iii) Self-declaration by 'Primary Raw Material Manufacturer of their PA-66 (Nylon 66) polymerization capacity and polymerization plant's location. iv) 'Primary Raw Material Manufacturer' must notify about available plant capacity to produce HVN (High Viscosity Nylon) PA-66 resin meeting raw material properties mentioned in Table 1B v) 'Primary Raw Material Manufacturer' should share information about their technical partner or distributor, who have presence in India, to deliver technical assistance and assist on sustainable suppliability of raw material to Indian Railway's approved vendors for HVN-66 Insulating liners. vi) 'Primary Raw Material Manufacturer' should apprise Indian Railways about their future localization plan of HVN PA-66 resin manufacturing in India under 'Make-in-India' policy. vii) Raw material manufacturer shall submit half yearly supply statement in signed hard copy and in excel format with following information to RDSO or Zonal Railways. i) Buyer's name ii) Quantity purchased iii) Buyer plant location iv) Buyer's PO number v) Supplier's invoice date with invoice number vi) Supplier warehouse location viii) HVN Liner manufacturer shall submit half	manufacturing in India to promote" Make in India" concept. We can save our valuable foreign currency by increasing viscosity of base polymer in India and doing more value addition in India. We can promote "make in India" concept like this. **(v)Primary raw material** manufacturer/distributor to have an office in India There have been extensive field trials done on HVN and product is well proven in all weather conditions. Bulk supplies have started and results are satisfactory. Hence, we feel	vendors of GFN liner have experience of molding of NYLON-66. But HVN-66 is very typical material with respect to molding parameters, shrinkage ration, design of screw barrel, pressure in the barrel etc. For a new vendor, it will be helpful to have a technical partner or distributor, who has presence in India, to deliver technical assistance. **Hence, suggestion is not accepted.**

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<td></td>
<td>During inspection of HVN Liner, the supplier should submit, the invoice alongwith e-way bill in support of procurement of raw material of particular grade from the primary raw material manufacturer with whom the written Memorandum of Understanding (MOU)/Contract has been signed.
Respective RAL color should be color-fast coloured master batches.
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<tr><th>S No.</th><th>Color</th><th>RAL</th><th>Liner Drg. No.</th></tr>
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<tr><td>3</td><td>Mint Green</td><td>6029</td><td>RT-3707</td></tr>
<tr><td>4</td><td>Cobalt Blue</td><td>5013</td><td>RT-3708</td></tr>
<tr><td>5</td><td>Brown Red-</td><td>3011</td><td>RT-6937</td></tr>
<tr><td>6</td><td>Mint Green</td><td>6029</td><td>RT-6938</td></tr>
<tr><td>7</td><td>Cobalt Blue</td><td>5013</td><td>RT-6939</td></tr>
<tr><td>8</td><td>Brown Red</td><td>3011</td><td>RT-8751</td></tr>
<tr><td>9</td><td>Mint Green</td><td>6029</td><td>RT-8752</td></tr>
<tr><td>10</td><td>Cobalt Blue</td><td>5013</td><td>RT-8753</td></tr>
</table>
</td>
<td>yearly Raw Material purchase and consumption statement in signed hard copy and in excel format with following information to RDSO or Zonal Railways

i) Opening Balance of Raw Material
ii) Quantity purchased with PO Number and date
iii) Source of raw material with plant location
iv) Raw Material Supplier's invoice date with invoice number
v) Raw Material Supplier's warehouse location
vi) Quantity of Raw Material consumed during the Half Year
vii) Quantity of HVN Liners supplied with drawing number
viii) Closing Balance of Raw Material

During inspection of HVN Liner, the supplier should submit, the invoice along with e-way bill in support of procurement of raw material of particular grade from the primary raw material manufacturer with whom the written Memorandum of Understanding (MOU)/Contract has been signed.
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<td>that raw material suppliers need for technical support is not required so much at the moment for product design. Technical specifications have been well framed and vendors are better qualified to talk on the product improvement as injection molding is the forte of the vendor and not so much of raw material supplier. They generally give guidance on processing parameters initially and then vendor has to mass produce keeping in check quality parameters a t all times. There are a handful of primary raw material</td>
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		8 Brown Red 3011 RT-8751 9 Mint Green 6029 RT-8752 10 Cobalt Blue 5013 RT-8753	manufacturers all across the world. Even in this scenario, there are only a handful of manufacturers who would have office in India. When material is completely imported, we do not see any need for him to keep any office here. This will only increase the cost and doesn't help in quality aspect at all. Technical team of the primary manufacturer should be available over phone and video conference for any technical support required to the vendor or Railways. Moreover vendor needs to have a complete setup including testing and	This aspect is all ready been discussed in various meetings. It was decided to make different colour liners based on the discussions. **Hence suggestion is not accepted.** **No comments.**

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			technical support as and when required by the Railways. Any stray case of failure may be evaluated on case-to-case basis.	**This aspect is already covered in the modified para.**
			Any such clause will restrict the number of options available to the vendors and will affect competitiveness of the product. We fear there may be collusion amongst handful of suppliers and vendors could be arm twisted thereby affecting supplies and also prices to Indian Railways. Hence, we feel there is no need for any office in India. Also this is against the basic principle	**This aspect is already covered in the modified para.** **This is not needed. Hence not accepted.**

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			of "open market" and "fair ground" for all manufacturers. We strongly oppose so many clauses as this would only drive away potential raw material manufacturers away from Indian market who do not have any office/ distributor in India. **Various RAL color shades:** We suggest use of natural material itself and not adding any color for visual segregation. Masterbatch is not approved by RDSO and there could be some element of doubt here. We suggest for color separation, we may print lot nos. with different	

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			colors. This should do away any RAL color test and any subjectivity during bulk production. **2.0 M/s Polyset , Mumbai:** **4.1.2** **ii) Accepted** **iii) Accepted** **iv) Accepted** **v) Accepted** **vi) Accepted** **vii) Accepted** **viii) Accepted** **3.0 M/s Surlon India Ltd., Ghaziabad:** Self-declaration by 'Primary Raw Material Manufacturer of their High viscous PA-66 (Nylon 66) polymerization capacity and polymerization plant's location with annual capacity for Production of HVPA-66	

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			(Nylon-66). **3.0 M/s Ascend Performance Materials India Pvt. Ltd., Tamil Nadu:** **(i)** Primary Raw Materials Manufacturer must provide proof of operating assets and available capacity to produce PA66 polymer, HVN (solid-stated PA66 polymer), and HMDA (Hexa Methylene Diamine). **(ii)** Primary Raw Materials Manufacturer must also provide proof of operating assets and available capacity to produce ADN (Adiponitrile – key precursor to make HMDA), or a secured	

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			contract to procure the same to feed the above-mentioned HMDA unit. (iii) Primary Raw Materials Manufacturer must provide proof of sales history in similar application in railway systems around the world.	

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<td>4.1.4 The physical properties of HVN-66 material used for the manufacture of nylon mouldings shall conform to the requirements given against item S. No. 1, 2, 3 & 10 of Table 1B. Other properties as given in Table-1B refer to the as moulded test specimen of HVN-66 material.

TABLE-1B (For HVN Liners)
<table>
<tr><th>S. No</th><th>Property</th><th>Units</th><th>Acceptance Values
HVN Liner</th><th>Test method</th></tr>
<tr><td>1.</td><td>Melting point</td><td>°C</td><td>258-268</td><td>ISO 11357-3-2018</td></tr>
<tr><td>2.</td><td>Specific gravity</td><td>-</td><td>1.10-1.16</td><td>BS EN ISO 1183-1:2019</td></tr>
<tr><td>3.</td><td>Ash content</td><td>%</td><td>0.5 (max)</td><td>Appendix IIIB</td></tr>
<tr><td>4.</td><td>Hardness Rockwell</td><td>R</td><td>100 (min)</td><td>ASTM D-785-08(2015)</td></tr>
<tr><td>5.</td><td>Tensile strength</td><td>Kg/mm^2</td><td>7.0(min)</td><td>ASTM D-638-14</td></tr>
<tr><td>6.</td><td>Elongation at break</td><td>%</td><td>35 (min)</td><td>-do-</td></tr>
<tr><td>7.</td><td>Dielectric strength</td><td>KV/mm</td><td>11(min)</td><td>ASTM D-149-20</td></tr>
<tr><td>8.</td><td>Volume resistivity</td><td>Ohm. Cm</td><td>10^{14}(min)</td><td>BS ISO 14309:2019</td></tr>
<tr><td>9.</td><td>Viscosity Number of raw material</td><td>cm^3/g</td><td>270 (min)</td><td>ISO 307</td></tr>
<tr><td>10.</td><td>Flexural Modulus</td><td>Kg/mm^2</td><td>250.0 (min)</td><td>ISO:178:2010 or ASTM: D 790</td></tr>
<tr><td>11</td><td>Flexural strength</td><td>Kg/mm^2</td><td>8 (min)</td><td>As per details in Appendix X</td></tr>
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<tr><td>10.</td><td>Flexural</td><td>Kg/</td><td>250.0</td><td>ISO:178:20</td></tr>
</table>
</td>
<td>1. M/s Sheth & Co., Mumbai:
4.1.4 The physical properties of HVN 66 material used for the manufacture of nylon mouldings shall confirm to requirements given against item Sr. No. 1,2,3 and 9
2.0 M/s Okay Industries , Mumbai:
Kindly add S. No. 9 of Table 1B "(for HVN [iners)" - Viscosity Number of Raw Material - this is an integral part of the Raw Material Testing and cannot be ignored.</td>
<td>The comments of the firm have been examined and Para has been modified.

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	Modulus	mm^2	(min)	10 or ASTM: D 790
11	Flexural strength	Kg/ mm^2	8 (min)	As per details in Appendix X

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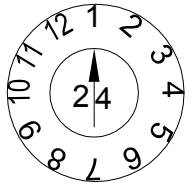
4.2	**MANUFACTURING PROCESS**			
	4.2.1 The glass filled nylon-66 and High viscous nylon-66 liners shall be manufactured by automatic screw type injection moulding machine. Raw Material must be preheated in Dehumidifier Chamber (with dew point from – 20° C to – 30° C). Before moulding moisture content should not be more than 0.2%.	4.2.1 The glass filled nylon-66 and High viscous nylon-66 liners shall be manufactured by automatic screw type injection moulding machine. Raw Material must be preheated in Dehumidifier Chamber (with dew point from – 20° C to – 30° C). Before moulding moisture content should not be more than 0.2%.	**1.0 Avadh Rail Infra. Ltd.:** NA	
	4.2.2 The GFN liner shall be conditioned by immersing in boiling water for adequate time to ensure minimum 3% absorption of water for GFN Liner as provided in para 7.7 (iii)	**4.2.2** The GFN liner shall be conditioned by immersing in boiling water for adequate time to ensure minimum 3% absorption of water for GFN Liner as provided in para 7.7 (iii)	**1.0 Avadh Rail Infra. Ltd.:** NA	Para has been modified.
	4.2.3 Marking: Each nylon moulding shall be legibly embossed in 3mm letters and figures with manufacturer's initials last two digits of year of manufacture and part number as shown in RDSO drawing.	**4.2.3** Marking: Each nylon moulding shall be legibly embossed in 3mm letters and figures with manufacturer's initials ~~last two digits of year~~ of manufacture ~~and~~ part number and year and month stamp of 08mm dia. as shown in RDSO drawing. 	**1. M/s Sheth & Co., Mumbai:** Calender should be kept optional. We may be given an option to mark month and year of manufacturer in the format mm/yy. **2. M/s Polyset, Mumbai:** Accepted\ **3.0 M/s AIL PLASTICS**	For claiming the warranty period of HVN Liner, it is necessary to emboss the month of the manufacturing. Hence the comments of the firm are not accepted. Calender clock is already in use on various Nylon components. Hence the comment of the firm is not accepted. Marking is to be done on the horn of the liner.

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			PVT. LTD., Kolkata: This requirement is not necessary, as the arrow pin of the date stamp may shift due to material pressure during the injection molding process. **4.0 Avadh Rail Infra. Ltd.:** 8mm dia is too small, dia should be min. 10 mm and required specific location on product drawing. **5.0 M/s Surlon India Ltd., Ghaziabad:** Each nylon moulding shall be legibly	Total thickness of the horn is 15mm and the edges are flited with 2R. The clear space available is only 11mm. Hence, the 06 to 08mm dia. For marking is kept. No Comments.

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			embossed in 3mm letters with part number and manufacturer's initials. The last two digits of year of manufacture and month shall appear on a stamp of 6 to 8mm dia.	
7.0	**TESTS**			
	7.5 Internal cavity test: Five sample liners per lot shall be checked for internal cavities. On sectioning along "y-y" shown in the PLAN of the liner in fig.1 Appendix-XI, no sample liner shall reveal any internal cavities when examined visually or with the help of a magnifying glass, for acceptance of the lot.	**7.5 Internal cavity test:** Five sample liners per lot shall be checked for internal cavities. On sectioning along "y-y" shown in the PLAN of the liner in fig.1 Appendix-XI, no sample liner shall reveal any internal cavities when examined visually or with the help of a magnifying glass, for acceptance of the lot.	**1. M/s Sheth & Co., Mumbai:** **7.5 Internal cavity test-** Sample shall not have any internal cavity more than 0.2 mm. We may put some size to this otherwise in bulk consignment it may create subjectivity.	This test is for, checking of molding parameters and is a proven one. Hence, the comments of the firm are not accepted.
	7.7 Percent water absorption test: (for GFN Liners only)	**7.7 Percent water absorption test: ~~(for GFN Liners only)~~**	**M/s AIL PLASTICS PVT. LTD., Kolkata:** Water conditioning of HVN liners is not required. 'While nylon conditioning	Conditioning of HVN liners has been introduced so that the stress induced in the liner during the molding gets released. Hence, the comments of the firm is not accepted.

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			enhances impact properties and elongation percentage, HVN material inherently possesses superior impact strength and elongation compared to conventional GFN material.' Boiling water conditioning of HVN liners is an unnecessary energy expenditure and may lead to hydrolysis, potentially reducing long term strength. 'We request the removal of the requirement for boiling water conditioning of HVN liners. **M/s Sheth & Co., Mumbai:** we agree to 1% annealing as it will improve the	No comments

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			impact strength of the product. It may be done as minimum 1 %.	
	7.7 (iv) For acceptance of the lot, the percent water absorption for the three sets considered individually shall not be less than 3% for GFN liner when calculated in the manner given in Appendix IV.	**7.7 (iv)** For acceptance of the lot, the percent water absorption for the three sets considered individually shall not be less than 3% for GFN liner and 1% for HVN liner when calculated in the manner given in Appendix IV.	1. **M/s Polyset Mumbai:** Water absorption test should not be introduced. 1. lt is difficult to maintained 1% water absorption. This will also lead into cost of the product without any technical advantage. 2. All dimensions will change after water absorption process. 3. There will be evaporation of water depending on the storage of the material at Railway Workshop as temperature is different at different area and humidity	Conditioning of HVN liners has been introduced so that the stress induced in the liner during the molding gets released. Percentage water absorption for HVN liner shall not be less than 1%. This value is the minimum value. After 1 to 1.5% water absorption in the HVN liner, dimensional changes are not accepted. Hence, the Para has been modified. There is an equilibrium state in the nylon, where, the nylon does not absorb or release moisture from atmosphere. As above. As above.

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			2. M/s Surlon India Ltd. , Ghaziabad: We do not recommend this. **3. M/s Okay Industries , Mumbai:** HVN Liners dimensions will change with the introduction of water absorption. We have subjected the Liners to Hammer Test and Cross Breaking Load and found the results satisfactory without annealing (without water absorption) and found this activity to be redundant and hence may be dropped.	
	7.10 Surface Roughness: (for HVN Liners only) Three sample liners per lot shall be checked for surface roughness. For acceptance of the lot each individual value on the three sample liners shall be within 0.1-0.2 Ra. Surface roughness shall be checked both on top and bottom surface of liners.	**7.10 Surface Roughness:** (for HVN Liners only) Three sample liners per lot shall be checked for surface roughness. For acceptance of the lot each individual value on the three sample liners shall be ~~within 0.1-~~ maximum upto 0.2 Ra. Surface roughness shall be checked both on top and bottom surface of liners.	**1. M/s Polyset, Mumbai:** Accepted **2. M/s Surlon India Ltd., Ghaziabad:** Changes	No comments.

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			suggested by RDSO in Clause 7.10 are all right.	
	7.11 RAL Colour Test: (for HVN Liners only) Three sample liners per lot shall be checked for RAL colour shade of moulded HVN Liners. For acceptance of the lot each individual RAL number of the three sample liners shall conform with the requirement given in clause 4.1.2.	**7.11 RAL Colour Test:** (for HVN Liners only) Three sample liners per lot shall be checked for RAL colour shade of moulded HVN Liners. For acceptance of the lot each individual RAL number of the three sample liners shall conform with the requirement given in clause 4.1.2.	**1. M/s Sheth & Co., Mumbai:** RAL color test **We may be given a delta of 10 on the instrument as it is not a very critical for functioning and is only for differentiation purpose. This may not be included in acceptance test and may just be used as a guiding purpose.**	RAL color can be tested as per their identical numbers. This is for all vendors. However, the comments of the firm have been examined and the table for the RAL color has been modified.
	New Para added	**7.12 Cross bending Strength:** (for HVN Liners only) Three samples of HVN liners per lot shall be tested in a manner as shown in Appendix-IX. For acceptance of the lot each individual sample liner should not break up to 20% deflection of span with minimum load for HVN liners defined in Appendix-II A.	**1. M/s Sheth & Co., Mumbai:** Cross bending strength- Our primary objective is to check whether the product is flexible and if it breaks or not. We may define minimum deflection of 20% and not	Suggestion of the firm has been examined and para has been modified accordingly.

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
			specify any load. Also the loads mentioned were taken on as molded sample and without annealing. We need to re examine the values after annealing. **2. M/s Polyset Mumbai:** Accepted **3. M/s AIL PLASTICS PVT. LTD., Kolkata:** This amendment is acceptable. **4. Avadh Rail Infra. Ltd.:** Bending Load should be as per Appen. II **5. M/s Surlon India Ltd. , Ghaziabad:** Changes suggested by RDSO in Clause 7.10 are all right.	
	New para added	**7.13 Fourier Transform Infrared Spectroscopy (FTIR Analysis/ Spectroscopy) (for HVN Liners only)** Page 12 of 30 Three samples of HVN liners per lot shall be tested for FTIR analysis method uses infrared light to scan test samples and observe	**1. M/s Sheth & Co., Mumbai:** This is an expensive	Suggestion of the firm has been examined and para has been deleted.

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
		chemical properties.	equipment and leads to a cost increase without giving any apparent benefit. If there is any failure, we may use this externally to do some evaluation. However, we feel that after annealing, failure should drastically reduce. **2. M/s Polyset Mumbai:** Accepted **3. M/s AIL PLASTICS PVT. LTD., Kolkata:** The requirement to scan test samples is unnecessary, as the five sample liners per lot are already inspected by cutting the leg section as per Fig.1, Appendix-Xl of the IRS specification.	As, above. As, above.

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
			This method effectively reveals any internal cavities when examined visually or with a magnifying glass. **4. Avadh Rail Infra. Ltd.:** No need if FTIR as in STR already specified basic raw material test DSC, Viscosity Numbers & other physical & performance test to verify and control raw material quality. FTIR will be additional burden with no proper uses for material identification **5. M/s Surlon India Ltd. , Ghaziabad:** We do not recommend this.	As, above.
	New para added	**7.14 Impact Test:** Sample HVN Liners shall be tested for Impact test as per Appendix-XII. For acceptance, each sample HVN liner should not	**1. M/s Sheth & Co., Mumbai:**	Suggestion of the firm has been examined and para has been modified accordingly.

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
		break or crack. Sampling shall be done as per clause 7.6.1 (ii).	Please clarify that by breaking it means breaking into 2 or more pieces or even a minor crack would be considered as a crack. There might be some indentation due to the impact and it shall not be mistaken as crack. Please clarify if 4 kg is only the hammer or including the arms weight. We shall manufacture the structure accordingly. 2. **M/s Polyset Mumbai:** Accepted **3. M/s Surlon India Ltd. , Ghaziabad:** Changes suggested by RDSO in Clause 7.10 are all right.	
8.0	**RE-TEST**			

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
	8.3 Should any one test sample fail in dimensions, the manufacturer may reoffer the liners lot wise only once after sorting out the defectives, with written permission of the inspecting authority. The re-offered lot shall be inspected for all tests in terms of acceptance test clause 7. If the reoffered lot fails again in dimensions, entire lot shall be rejected.	**8.3** Should any one test sample fail in dimensions, the manufacturer may reoffer the liners lot wise only once after sorting out the defectives, with written permission of the inspecting authority. The re-offered lot shall be inspected for all tests in terms of acceptance test clause 7. If the reoffered lot fails again in dimensions, entire lot shall be rejected.	**1.0 Avadh Rail Infra. Ltd.:** If any failure required double sampling as per others RDSO Specification	The existing practice has been followed for molding items. Hence not accepted.

<table>
<tr><th>Para No.</th><th>Existing provision in Specification of GFN-66/HVN-66 Liner</th><th>Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)</th><th>Comments /Suggestions by approved vendors</th><th>RDSO's Remarks</th></tr>
<tr><td>APPENDIX-II</td><td>
(IRS-T-44-2023)
TEST FOR CROSS BREAKING LOAD OF GFN LINER
1. METHOD
1.1 The test shall be carried out as per IS:1998 with the following changes:
i) The liner will be tested in a manner as shown in Appendix-IX
ii) The radius of support points and of loading point shall be 1.5 mm.
iii) The distance between the support points, rate of traverse of jaws of the testing machine and the acceptable value of cross-breaking load shall be as given in the table below:
<table>
<tr><th>S. No</th><th>Drawing No</th><th>Distance between support points(x)</th><th>Rate of traverse of jaws</th><th>Cross breaking load (min)</th></tr>
<tr><td>(1)</td><td>(2)</td><td>(3)</td><td>(4)</td><td>(5)</td></tr>
<tr><td>1.</td><td>RDSO/T-2505</td><td>45mm</td><td>50mm/mt</td><td>360kg</td></tr>
<tr><td>2.</td><td>RDSO/T-3516</td><td>45mm</td><td>50 mm/mt</td><td>420kg</td></tr>
<tr><td>3</td><td>RDSO/T-3702</td><td>60mm</td><td>5 mm/mt</td><td>480kg</td></tr>
<tr><td>4</td><td>RDSO/T-3706</td><td>60mm</td><td>5 mm/mt</td><td>390kg</td></tr>
<tr><td>5</td><td>RDSO/T-3707</td><td>60mm</td><td>5 mm/mt</td><td>720kg</td></tr>
<tr><td>6</td><td>RDSO/T-3708</td><td>60mm</td><td>5 mm/mt</td><td>960kg</td></tr>
<tr><td>7</td><td>RDSO/T-3723</td><td>45mm</td><td>5 mm/mt</td><td>600kg</td></tr>
<tr><td>8</td><td>RDSO/T-8751</td><td>60mm</td><td>5 mm/mt</td><td>490kg</td></tr>
</table>
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(IRS-T-44-2023)
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<tr><td>5</td><td>RDSO/T-3707</td><td>60mm</td><td>5 mm/mt</td><td>720kg</td></tr>
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</table>
</td><td>1.0 Avadh Rail Infra. Ltd.:
NA</td><td>No comments</td></tr>
</table>

<table>
<tr><th>Para No.</th><th>Existing provision in Specification of GFN-66/HVN-66 Liner</th><th>Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)</th><th>Comments /Suggestions by approved vendors</th><th>RDSO's Remarks</th></tr>
<tr>
<td></td>
<td>
<table>
<tr><td>9</td><td>RDSO/T-8752</td><td>60mm</td><td>5 mm/mt</td><td>760kg</td></tr>
<tr><td>10</td><td>RDSO/T-8753</td><td>60mm</td><td>5 mm/mt</td><td>1000kg</td></tr>
<tr><td>11</td><td>RDSO/T-6938</td><td>60mm</td><td>5 mm/mt</td><td>648 Kg</td></tr>
<tr><td>12</td><td>RDSO/T-6939</td><td>60mm</td><td>5 mm/mt</td><td>864 Kg</td></tr>
<tr><td>13</td><td>RDSO/T-8222</td><td>60mm</td><td>5 mm/mt</td><td>885 Kg</td></tr>
<tr><td>14</td><td>RDSO/T-8223</td><td>60mm</td><td>5 mm/mt</td><td>914 Kg</td></tr>
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Note: For GFN liners other than those mentioned above, the CBL value shall be specified by RDSO as per requirement.
</td>
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<td></td>
<td>New Appendix-IIA added</td>
<td>
APPENDIX-IIA (IRS-T-44-2023)
TEST FOR CROSS BENDING STRENGTH OF HVN LINER
i) The liner will be tested in a manner as shown in Appendix-IX
ii) The radius of support points and of loading point shall be 1.5 mm.
iii) The distance between the support points, rate of traverse of jaws of the testing machine and the acceptable value of cross-breaking load shall be as given in the table below:
<table>
<tr><th>S. No</th><th>Drawing No</th><th>Distance between</th><th>Rate of traverse of jaws</th><th>Cross breaking load (min)</th></tr>
</table>
</td>
<td>1.0 Avadh Rail Infra. Ltd.: Required correction for bending load in place of bending strength</td>
<td>Suggestion of the firm has been examined and appendix has been deleted.</td>
</tr>
</table>

<table>
<tr><th>Para No.</th><th>Existing provision in Specification of GFN-66/HVN-66 Liner</th><th>Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)</th><th>Comments /Suggestions by approved vendors</th><th>RDSO's Remarks</th></tr>
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<table>
<tr><td></td><td></td><td>support points(x) (mm)</td><td>(mm/mt)</td><td>(Kg)</td></tr>
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<tr><td>1</td><td>RDSO/T-3702</td><td>60</td><td>5</td><td>480</td></tr>
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<tr><td>3</td><td>RDSO/T-3707</td><td>60</td><td>5</td><td>795</td></tr>
<tr><td>4</td><td>RDSO/T-3708</td><td>60</td><td>5</td><td>1164</td></tr>
<tr><td>5</td><td>RDSO/T-8751</td><td>60</td><td>5</td><td>482</td></tr>
<tr><td>6</td><td>RDSO/T-8752</td><td>60</td><td>5</td><td>977</td></tr>
<tr><td>7</td><td>RDSO/T-8753</td><td>60</td><td>5</td><td>1424</td></tr>
<tr><td>8</td><td>RDSO/T-6938</td><td>60</td><td>5</td><td>721</td></tr>
<tr><td>9</td><td>RDSO/T-6939</td><td>60</td><td>5</td><td>987</td></tr>
</table>
Note: For HVN liners other than those mentioned above, the CBS value shall be specified by RDSO as per requirement.
</td><td></td><td></td></tr>
<tr><td>APPENDIX-IIIA</td><td>(IRS-T-44-2023)
A. GLASS FILLER CONTENT
1. METHOD
1.1. Take a crucible and heat it by keeping in a muffle furnace till a constant weight of the crucible is obtained. Let its weight be = WC
1.2 Take approximately 2 gm of the specimen of the GFN-66 liner in the above crucible and find the weight of the crucible and specimen as above. Lot combined weight = WCGN
1.3 Then burn the nylon of the specimen by keeping the crucible in the muffle furnace till shining glass is noticed. Allow it to cool to the room temperature.
1.4 Then weigh the above crucible and glass after cooling.</td><td>(IRS-T-44-2023)
A. GLASS FILLER CONTENT
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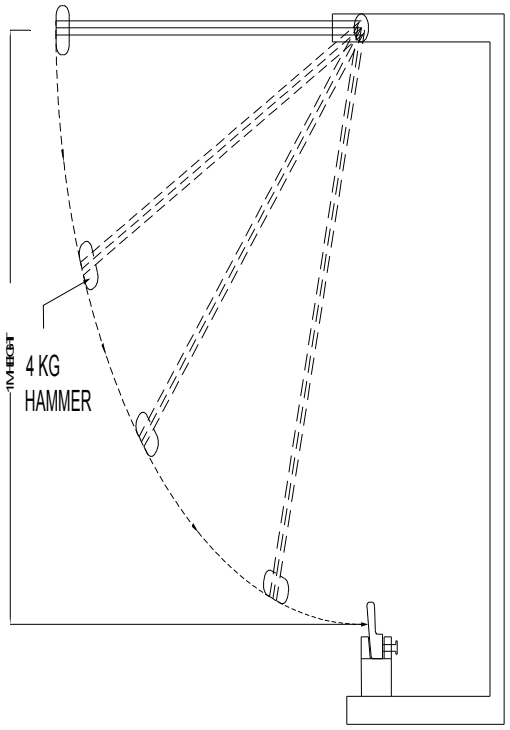
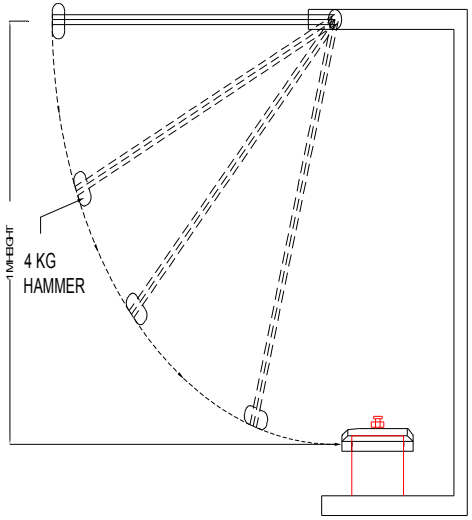
1.3 Then burn the nylon of the specimen by keeping the crucible in the muffle furnace till shining glass is noticed. Allow it to cool to the room temperature.</td><td>1.0 Avadh Rail Infra. Ltd.:
NA</td><td>No comments</td></tr>
</table>

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
	Let its combined weight be = WCG **2. GLASS FILLER % CALCULATION** 2.1 Find out weight of GFN-66 specimen as: WGN = WCGN -WC 2.2 Find out weight of Glass filler as: WG = WCG –WC 2.3 Therefore, weight of Glass filler % = WG/ WGN x100	1.4 Then weigh the above crucible and glass after cooling. Let its combined weight be = WCG **2. GLASS FILLER % CALCULATION** 2.1 Find out weight of GFN-66 specimen as: WGN = WCGN -WC 2.2 Find out weight of Glass filler as: WG = WCG –WC 2.3 Therefore, weight of Glass filler % = WG/ WGN x100		
	New Appendix-XII added	**Appendix-XII** **ARRANGEMENT FOR HAMMER TEST ON HVN LINER**  	**1.0 M/s Polyset, Mumbai:** Accepted **2.0 M/s AIL PLASTICS PVT. LTD., Kolkata:** This amendment is acceptable	No comments As per comments of the firm one Appendix XII A has been added.
		Appendix-XII A **ARRANGEMENT FOR HAMMER TEST ON HVN LINER**		

Para No.	Existing provision in Specification of GFN-66/HVN-66 Liner	Modified provision in Specification of GFN-66/HVN-66 Liner (Modification shown in red)	Comments /Suggestions by approved vendors	RDSO's Remarks
				

*** M/s Ascend Performance Materials India Pvt. Ltd., Tamil Nadu:**

Rationale for suggested changes:

Ascend would like to ensure that most capable (backward integrated) raw materials suppliers with relevant application expertise are participating in this 'safety-critical' system in the interest of larger public good. We believe that a backward integrated producer of PA66 materials would provide security of supply, control of quality-defining inputs, and relatively stable long-term cost position – all critical to sustaining a long-term program.