Reasoned Document for Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2',

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
1.0	Purpose	These guidelines are based on Indian Railway Standard specification for manufacture of Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners to IRS T-44-2023 The purpose is to specifically define the guidelines and technical & other requirements for manufacture & supply of Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners ~~as well as to specify technical and other Requirements.~~	No comments/Suggestions from approved/ developmental vendors has been received	No change	These guidelines are based on Indian Railway Standard specification for manufacture of Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners to IRS T-44-2023 The purpose is to specifically define the guidelines and technical & other requirements for manufacture & supply of Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners ~~as well as to specify technical and other Requirements.~~
2.0	**Scope of Application**	This document shall be applicable for manufacturing & supply of Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners. This document shall be applicable for initial capability assessment, periodic Quality audit for extension of approval, up-gradation of vendors and maintaining their approved list for GFN & HVN Liner.	No comments/Suggestions from approved/ developmental vendors has been received	No change	This document shall be applicable for manufacturing & supply of Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners. This document shall be applicable for initial capability assessment, periodic Quality audit for extension of approval, up-gradation of vendors and maintaining their approved list for GFN & HVN Liner.
3.0	**Procedure / Details**	Procedure/details are annexed.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Procedure/details are annexed.
4.0	**Referenced Documents**	i) IRS specification for Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners, IRS T-44-2020 ii) ISO Apex Documents of RDSO	No comments/Suggestions from approved/ developmental vendors has been received	No change	i) IRS specification for Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners, IRS T-44-2020 ii) ISO Apex Documents of RDSO
5.0	**Referenced Documents of External Origin**	None.			None.

<table>
<tr><th>SN</th><th>Para</th><th>Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. ‘2’</th><th>Comments of Stake holders</th><th>RDSO’s Remarks</th><th>Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. ‘2’</th></tr>
<tr><td>6.0</td><td>Associated Records</td><td>None.</td><td></td><td></td><td></td></tr>
<tr><td>7.0</td><td>Responsibility and Authority</td><td>
<table>
<tr><th>Activity</th><th>Responsible</th><th>Approver</th><th>Supporting</th><th>Consulted</th><th>Informed</th></tr>
<tr><td>Creation, maintenance of this document</td><td>ED/Track-II/ Director / Track-IV</td><td>PED/ Track Design</td><td>DD/AIE / ADE</td><td>M&C Dte.</td><td>All approved vendors through website</td></tr>
<tr><td>Compliance of directives contained in this document</td><td>DD/ AIE/ ADE</td><td>Director/ Track Design -IV</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Requirement of deviation from this directive</td><td>ED/Track-II/ Director/Track-IV</td><td>PED/ Track Design</td><td>DD/AIE / ADE</td><td>M&C Dte.</td><td>-</td></tr>
</table>
Abbreviations
<table>
<tr><td>PED/Track Design</td><td>Principal Executive Director/ Track Design</td></tr>
<tr><td>ED/Track-III</td><td>Executive Director/Track Design-III</td></tr>
<tr><td>RDSO</td><td>Research Designs & Standards Organization</td></tr>
<tr><td>DD</td><td>Dy. Director</td></tr>
<tr><td>AIE</td><td>Assistant Inspecting Engineer</td></tr>
<tr><td>ADE</td><td>Assistant Design Engineer</td></tr>
</table>
</td><td>M/S Black Burn & Co. Pvt. Ltd</td><td>At annexure-I</td><td>
<table>
<tr><th>Activity</th><th>Responsible</th><th>Approver</th><th>Supporting</th><th>Consulted</th><th>Informed</th></tr>
<tr><td>Creation, maintenance ofthis document</td><td>ED/Track-II/ Director / Track-IV</td><td>PED/ Track Design</td><td>DD/AIE / ADE</td><td>M&C Dte.</td><td>All approved vendors through website</td></tr>
<tr><td>Compliance of directives contained in this document</td><td>DD/ AIE/ ADE</td><td>Director/ Track Design -IV</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Requirement of deviation from this directive</td><td>ED/Track-II/ Director/Track-IV</td><td>PED/ Track Design</td><td>DD/AIE / ADE</td><td>M&C Dte.</td><td>-</td></tr>
</table>
Abbreviations
<table>
<tr><td>PED/Track Design</td><td>Principal Executive Director/ Track Design</td></tr>
<tr><td>ED/Track-II</td><td>Executive Director/Track Design-II</td></tr>
<tr><td>RDSO</td><td>Research Designs & Standards Organization</td></tr>
<tr><td>DD</td><td>Dy. Director</td></tr>
<tr><td>AIE</td><td>Assistant Inspecting Engineer</td></tr>
<tr><td>ADE</td><td>Assistant Design Engineer</td></tr>
</table>
</td></tr>
<tr><td>8.0</td><td>The process</td><td>i) Vendor seeking fresh registration for the particular item (GFN/HVN) shall register online on UVAM portal website</td><td>Comments of M/s Industrial Components</td><td>Remarks at Annexure -I</td><td>i) Vendor seeking fresh registration for the particular item (GFN/HVN) shall register online on UVAM portal website https://www.ireps.gov.in.</td></tr>
</table>

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
	of approval of Glass Filled Nylon-66 Insulating Liners and High Viscous Nylon-66 Insulating Liners will involve following steps / activities .	https://www.ireps.gov.in.	**Industries, M/s Polymer Products of India & M/S Black Burn & Co. Pvt. Ltd**		
		ii) Submit duly filled-in online fresh application form along with vendor registration charges as applicable at the time of submission.			ii) Submit duly filled-in online fresh application form along with vendor registration charges as applicable at the time of submission.
		iii) Upload the document as mentioned along with QAP and legal documents for technical approval by this office.			iii) Upload the document as mentioned along with QAP and legal documents for technical approval by this office.
		iv) The specification & relevant drawings are available on RDSO website & UVAM portal and same can be downloaded from RDSO website. The charges of these documents are included in fresh registration charges and no need to deposit separate charges for these documents at the first time.			iv) The specification & relevant drawings are available on RDSO website & UVAM portal and same can be downloaded from RDSO website. The charges of these documents are included in fresh registration charges and no need to deposit separate charges for these documents at the first time.
		v) Application/ proforma along with documents & charges will be scrutinized by RDSO and if details are found satisfactory, the works unit of the firm will be visited for Capability Assessment.			v) Application/ proforma along with documents & charges will be scrutinized by RDSO and if details are found satisfactory, the works unit of the firm will be visited for Capability Assessment.
		vi) If any shortcomings are observed during the visit, the same will be conveyed to the firm for their compliance.			vi) If any shortcomings are observed during the visit, the same will be conveyed to the firm for their compliance.
		vii) After satisfactory compliance by the firm, the firm is shall be advised to submit gauge checking charges and Inspection gauges of the drawings for the particular item applied for. Glass Filled Nylon-66 Insulating .Inspection gauges will be checked and approved prior to/ during STR verification visit.			vii) After satisfactory compliance by the firm, the firm is shall be advised to submit gauge checking charges and Inspection gauges of the drawings for the particular item applied for. Glass Filled Nylon-66 Insulating .Inspection gauges will be checked and approved prior to/ during STR verification visit
		viii) After satisfactory verification of documents and CCA (Capacity cum Capability Assessment), the name of the firm shall be considered to be placed in the "List of RDSO vendors for Developmental order" for 24 months period subject to technical clearance of Prototype/ Test samples and its approval by the RDSO (to be mentioned in check note in Vendor directory).			viii) After satisfactory verification of documents and CCA (Capacity cum Capability Assessment), the name of the firm shall be considered to be placed in the **"List of RDSO vendors for Developmental order"** for 24 months period subject to technical clearance of Prototype/ Test samples ~~and its approval by RDSO~~ and successful completion of

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
					field trials for the duration specified for the item by RDSO. (to be mentioned in check note in Vendor directory).
		ix) After clearance / approval of two sets of inspection gauges as mentioned in para (vii) above, the firm would be advised to start trial production and to submit internal test results in formats as per Quality Assurance Programme (QAP) for manufacture and testing. If the internal test results are found satisfactory, the firm would be advised for drawl of samples manufactured in presence of RDSO official from their works.			ix) After clearance / approval of two sets of inspection gauges as mentioned in para (vii) above, the firm would be advised to start trial production and to submit internal test results in formats as per Quality Assurance Programme (QAP) for manufacture and testing. If the internal test results are found satisfactory, the firm would be advised for drawl of samples manufactured in presence of RDSO official from their works.
		x) The testing of the samples drawn will be carried out as per clause laid down in IRS specification for Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners, Sl. No. T-44-2020. If test report is found satisfactory and other conditions are fulfilled, the conditional check note in Vendor directory as mentioned in para viii above shall be removed. The firm will be advised to start production of the product. If implementation of QAP is found satisfactory, the purchaser may be advised to get the inspection of the product initial quantity by RDSO/nominated inspecting agency and regular quantity by ~~RITES~~ nominated inspecting agency.			x) The testing of the samples drawn will be carried out as per clause laid down in IRS specification for Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners, Sl. No. T-44-2020. If test report is found satisfactory and other conditions are fulfilled, the conditional check note in Vendor directory as mentioned in para viii above shall be removed. The firm will be advised to start production of the product. If implementation of QAP is found satisfactory, the purchaser may be advised to get the inspection of the product initial quantity by RDSO/nominated inspecting agency and regular quantity by ~~RITES~~ nominated inspecting agency.
		xi) In the case of new Vendor/firms the process of approval will be initiated only if the firm has applied on-line or has been placed with developmental order from Zonal Railways/ Railway Board or given go ahead from RDSO as per instructions /guidelines of Railway Board from time to time. Rest of the procedure for approval will be the same as detailed in para1.0 above.			xi) In the case of new Vendor/firms the process of approval will be initiated only if the firm has applied on-line or has been placed with developmental order from Zonal Railways/ Railway Board or given go ahead from RDSO as per instructions /guidelines of Railway Board from time to time. Rest of the procedure for approval

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
					will be the same as detailed in para1.0 above.
		xii) In case, firms approved for manufacturing of ~~Glass~~ Filled ~~Nylon-66 Insulating Liners~~ ~~to~~ one drawing for a particular item (GFN/HVN), desires to develop the product to other drawings for the same item, the requisite inspection gauges will have to be approved by RDSO. After getting satisfactory internal test reports, the samples will be drawn and tested at RDSO. If test results on samples found satisfactory, the firm would be considered for inclusion in the "List of RDSO Vendors for Developmental Orders" as per the provisions of latest ISO apex documents.			xii) In case, firms approved for manufacturing of ~~Glass~~ Filled ~~Nylon-66 Insulating Liners~~ ~~to~~ one drawing for a particular item (GFN/HVN), desires to develop the product to other drawings for the same item, the requisite inspection gauges will have to be approved by RDSO. After getting satisfactory internal test reports, the samples will be drawn and tested at RDSO. If test results on samples found satisfactory, the firm would be considered for inclusion in the "List of RDSO Vendors for Developmental Orders" as per the provisions of latest ISO apex documents.
		xiii) Up-gradation from "List of RDSO Vendors for Developmental Orders" to "List of Approved Vendors" shall be as per procedure mentioned in RDSO's latest ISO apex document.			xiii) Up-gradation from "List of RDSO Vendors for Developmental Orders" to "List of Approved Vendors" shall be as per procedure mentioned in RDSO's latest ISO apex document.
A	**ITEM SPECIFIC GUIDELINES**				
		In addition to the procedure for vendor approval given in the 'ISO Documents' the following specific guidelines shall also be applicable to vendor seeking approval for manufacture of GFN~~-66~~ liners & HVN Liners.	No comments/Suggestions from approved/ developmental vendors has been received	No change	In addition to the procedure for vendor approval given in the 'ISO Documents' the following specific guidelines shall also be applicable to vendor seeking approval for manufacture of GFN~~-66~~ liners & HVN Liners.
		~~**GFN-66 liners**~~			
	1.0	After successful assessment of firm in accordance with the 'ISO Documents' and approval of inspection gauges the firm will be asked to submit Internal test results of type tests and product testing as per scheme of testing for pre- acceptance test for approval of samples as embodied in the IRS specification for Glass Filled Nylon-66 & High viscous Nylon-66 liners IRS.T-44-2023.	No comments/Suggestions from approved/ developmental vendors has been received	No change	After successful assessment of firm in accordance with the 'ISO Documents' and approval of inspection gauges the firm will be asked to submit Internal test results of type tests and product testing as per scheme of testing for pre- acceptance test for approval of samples as embodied in the IRS specification for Glass Filled Nylon-66 & High viscous Nylon-66 liners IRS.T-44-2023.
	2.0	After the above results are considered acceptable by RDSO, samples for type tests and product testing for approval in RDSO	No comments/Suggestions from approved/ developmental	No change	After the above results are considered acceptable by RDSO, samples for type tests and product testing for

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		shall be required to be manufactured in the presence of RDSO's representative and these shall be drawn by him. The samples for type tests and product testing shall be drawn in the same go.	vendors has been received		approval in RDSO shall be required to be manufactured in the presence of RDSO's representative and these shall be drawn by him. The samples for type tests and product testing shall be drawn in the same go.
	2.1	Samples for approval shall be tested in two stages as given below:- i) For type test ii) For product testing.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Samples for approval shall be tested in two stages as given below:- iii) For type test For product testing.
	2.2	The product testing shall be undertaken only if the samples have passed in the 'type tests'. If the samples fail in the type test, samples in product testing shall also be deemed to have failed and fresh samples shall be drawn both for the 'type tests' as well as for the 'product testing'.	No comments/Suggestions from approved/ developmental vendors has been received	No change	The product testing shall be undertaken only if the samples have passed in the 'type tests'. If the samples fail in the type test, samples in product testing shall also be deemed to have failed and fresh samples shall be drawn both for the 'type tests' as well as for the 'product testing'.
	2.3	If the samples pass in type tests and fail in product testing fresh samples shall be invited only for the product testing.	No comments/Suggestions from approved/ developmental vendors has been received	No change	If the samples pass in type tests and fail in product testing fresh samples shall be invited only for the product testing.
	2.4	It shall be the firm's responsibility to ensure that 'as moulded' samples/specimen are sealed and guarded against the ingress of moisture. The samples should bear the signature of the RDSO's representative deputed to witness production and to draw the samples and signatures of the representative of the firm.	No comments/Suggestions from approved/ developmental vendors has been received	No change	It shall be the firm's responsibility to ensure that 'as moulded' samples/specimen are sealed and guarded against the ingress of moisture. The samples should bear the signature of the RDSO's representative deputed to witness production and to draw the samples and signatures of the representative of the firm.
	2.5	The samples will be left in sealed condition with the firm and it shall be the responsibility of firm to deliver the same to RDSO (M&C Dte.) within 15 days from the date of drawl of samples. The samples along with a set of approved gauges shall be sent to RDSO, with a letter addressed to the Director General/M&C RDSO, Lucknow and copy to the Director General/Track, RDSO, Lucknow.	**Comments of M/S Black Burn & Co. Pvt. Ltd:**	Remarks at annexure-I	
	2.6	If the samples are not found satisfactory as per specification in	No comments/Suggestions from approved/ developmental	No change	If the samples are not found satisfactory as per

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		RDSO testing, the firm will be intimated to submit fresh samples for testing as per the procedure described above.	vendors has been received		specification in RDSO testing, the firm will be intimated to submit fresh samples for testing as per the procedure described above.
	2.7	After the passing of samples both in type tests as well as in product testing, the firm will be considered for inclusion in the list of 'Vendors for Developmental order' of 'Vendor Directory', for the type of liners developed, as per the criteria laid in the ISO document for vendor approval.	No comments/Suggestions from approved/ developmental vendors has been received	No change	After the passing of samples both in type tests as well as in product testing, the firm will be considered for inclusion in the list of 'Vendors for Developmental order' of 'Vendor Directory', for the type of liners developed, as per the criteria laid in the ISO document for vendor approval.
B	**SCHEDULE OF TECHNICAL REQUIREMENTS OF FIRMS TO MANUFACTURE OF GFN-66 & HVN-66 LINERS**				
	1.0	**SCOPE:** The schedule of technical requirements covers the norms for manufacture of GFN-66 & HVN-66 liners to be used in permanent way track on Indian Railways.	No comments/Suggestions from approved/ developmental vendors has been received	No change	**SCOPE:** The schedule of technical requirements covers the norms for manufacture of GFN-66 & HVN-66 liners to be used in permanent way track on Indian Railways.
	2.0	**GENERAL & MANUFACTURE FACILITIES** The vendor seeking approval shall comply with all the below mentioned requirements.	No comments/Suggestions from approved/ developmental vendors has been received	No change	**GENERAL & MANUFACTURE FACILITIES** The vendor seeking approval shall comply with all the below mentioned requirements.
	2.1	Covered area with adequate space for storage of raw material and finished product should be available which is free from dampness and humidity. They should have separate damp free secured bond room with adequate space for accommodating at least 50,000 nos. of such finished product.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Covered area with adequate space for storage of raw material and finished product should be available which is free from dampness and humidity. They should have separate damp free secured bond room with adequate space for accommodating at least 50,000 nos. of such finished product.
	2.2	De-humidifier with digital temperature and humidity controller & indicator of suitable capacity for pre-dehumidiation of raw material should be available.	**Comments of M/s Carbonaire, & M/S Black Burn & Co. Pvt. Ltd:**	Remarks at Annexure-I	
	2.3	Horizontal screw type fully automatic PLC based injection-moulding machine should be available for moulding; preferably 380 gms shot (granules) capacity	No comments/Suggestions from approved/ developmental vendors has been received	No change	
	2.4	Temperature of hydraulic oil and moulds should be kept	No comments/Suggestions from approved/ developmental	No change	

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		controlled by suitable cooling system.	vendors has been received		
	2.5	Electrical hoist/manual block & tackle for mounting & dismounting of moulds should be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	
	2.6	Suitably designed dies & moulds for products (minimum 2 nos. for each size & drawing No.) should be available. Dies/moulds may be of two cavity or multi-cavity, but permission will be given for bulk production as per the cavity number used during approval time. It is mandatory to use hot runner moulds in case where manufacturer is using moulds having more than 4 cavities. However vendors who desire to use hot runner mould having four cavities or less is permitted.	**Comments of M/s Polyset:**		Suitably designed dies & moulds for products (minimum 2 nos. for each size & drawing No.) should be available. Dies/moulds may be of two cavity or multi-cavity, but permission will be given for bulk production as per the cavity number used during approval time. It is mandatory to use hot runner moulds in case where manufacturer is using moulds having more than 4 cavities. However vendors who desire to use hot runner mould having four cavities or less is permitted.
	2.7	Annealing tank of suitable capacity with thermostat facility and digital temperature indicator should be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Annealing tank of suitable capacity with thermostat facility and digital temperature indicator should be available.
	2.8	All the moulds/die shall be of hardened steel including the mould for tensile test piece. The manufacturer's insignia, drg. No. and cavity no. shall have permanent engraving while the manufacturing year marking may be of injector-pin type.	No comments/Suggestions from approved/ developmental vendors has been received	No change	All the moulds/die shall be of hardened steel including the mould for tensile test piece. The manufacturer's insignia, drg. No. and cavity no. shall have permanent engraving while the manufacturing year marking may be of injector-pin type.
	2.9	The manufacturer should have all in-house arrangement for screen printing so that the products treated & finished inside the factory.	**Comments of M/s OKAY Industries, M/s Carbonaire & M/s Calstar Steel Limited:**	Remarks at annexure-I	The manufacturer should have all in-house arrangement for screen printing for GFN liner so that the products treated & finished inside the factory.
	2.10	De-flashing tools of suitable design in adequate nos. to be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	De-flashing tools of suitable design in adequate nos. to be available.
	2.11	Minimum infrastructure for maintenance and polishing of dies & moulds should be available in-house.	No comments/Suggestions from approved/ developmental	No change	Minimum infrastructure for maintenance and polishing of dies & moulds should be available in-

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
			vendors has been received		house.
	2.12	Diesel Generator of adequate capacity should be installed to take up the load of the entire plant in case of power failure.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Diesel Generator of adequate capacity should be installed to take up the load of the entire plant in case of power failure.
3.0	**TESTING FACILITIES**				
	A	Common for GFN-66 and HVN-66 Liners			
	3.1	Ambience in the testing laboratory should be suitably controlled for humidity and temperature with digital indicator facility.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Ambience in the testing laboratory should be suitably controlled for humidity and temperature with digital indicator facility.
	3.2	Computerized tensile testing machine with extensometer or suitable measuring arrangement and all provisions in accordance with ASTM-D-638-14 & EN-ISO 527-1:2019 or testing strength and elongation percentage and speed gear system to suit the different testing speeds for different types/drg. No. should be available. Test fixture for checking cross breaking load should also be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Computerized tensile testing machine with extensometer or suitable measuring arrangement and all provisions in accordance with ASTM-D-638-14 & EN-ISO 527-1:2019 or testing strength and elongation percentage and speed gear system to suit the different testing speeds for different types/drg. No. should be available. Test fixture for checking cross breaking load should also be available.
	3.3	Necessary apparatus for testing the melting point and specific gravity in accordance with IS:5762-1970 & BS EN ISO 1183-1:2019 respectively should exist with digital display for melting point. The weighing balance used for weighing sample in air/water should have digital display.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Necessary apparatus for testing the melting point and specific gravity in accordance with IS:5762-1970 & BS EN ISO 1183-1:2019 respectively should exist with digital display for melting point. The weighing balance used for weighing sample in air/water should have digital display.
	3.4	A single pa digital type chemical balance shall be available having capacity to read upto 4^{th} decimal.	No comments/Suggestions from approved/ developmental vendors has been received	No change	A single pa digital type chemical balance shall be available having capacity to read upto 4^{th} decimal.
	3.5	Digital vernier calipers ~~and three-point digital bore gauges (Min.2 nos. of each)~~ should be available.	**Comments of M/s OKAY Industries & M/s Carbonaire :**	Remarks at Annexure-I	Digital vernier calipers ~~and three-point digital bore gauges (Min.2 nos. of each)~~ should be available
	3.6	One Rockwell hardness tester having R-scale facility along with standard test block should be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	One Rockwell hardness tester having R-scale facility along with standard test block should be available.
	3.7	One muffle furnace of capacity 0-1000ºC with temperature	No comments/Suggestions from	No change	One muffle furnace of capacity 0-1000ºC with

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		controller & indicator should be available along with sufficient numbers of desiccator and crucibles for checking glass filler by ash content (%).	approved/ developmental vendors has been received		temperature controller & indicator should be available along with sufficient numbers of desiccator and crucibles for checking glass filler by ash content (%).
	3.8	Stopwatch with least count reading of 0.1 seconds should be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Stopwatch with least count reading of 0.1 seconds should be available.
	3.9	Barometer & hygrometer in the laboratory should be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Barometer & hygrometer in the laboratory should be available.
	3.10	All measuring gauges of the products should be hardened/or chrome plated (two sets).	No comments/Suggestions from approved/ developmental vendors has been received	No change	All measuring gauges of the products should be hardened/or chrome plated (two sets).
	3.11	One magnifying glass of min 20x for checking surface finish and internal cavity should be available.	No comments/Suggestions from approved/ developmental vendors has been received	No change	One magnifying glass of min 20x for checking surface finish and internal cavity should be available.
	3.12	For checking calibration of tensile/ compression testing machine, preferably one number proving ring of min. 5t capacity duly calibrated by NPL should be available with suitable links for in-house calibration.	No comments/Suggestions from approved/ developmental vendors has been received	No change	For checking calibration of tensile/ compression testing machine, preferably one number proving ring of min. 5t capacity duly calibrated by NPL should be available with suitable links for in-house calibration.
	3.13	3-D laser based equipment for measurement of critical dimensions (i.e. liner thickness, rib thickness and outer dimension) of GFN liners with facility for laser paint marking (green dots for dimensionally OK material and red dot for dimensionally not OK material) with provision for automatic segregation of pass and un-passed material shall be provided. The equipment shall be provided on production line (after annealing) itself.	**Comments of M/s OKAY Industries , M/s Carbonaire, M/s Calstar Steel Limited, M/s Unique Plastic Industries, M/S Black Burn & Co. Pvt. Ltd, M/s Moulded Fibreglass Products, M/s Adinath Industries, M/s Parasnath Enterprises, M/s Polyset & M/s Avadh Rail Infra Ltd.**	Remarks at Annexure-I	3-D laser based equipment for measurement of critical dimensions (i.e. liner thickness, rib thickness and outer dimension) of GFN liners with facility for laser paint marking (green dots for dimensionally OK material and red dot for dimensionally not OK material) with provision for automatic segregation of pass and un-passed material shall be provided. The equipment shall be provided on production line (after annealing) itself.
	B.	Additional testing facilities for HVN Liners			
	3.14	One Viscometer of size no. 2 complying with the requirements of ISO 3105, for measuring viscosity number should be available.	**Comments of M/s OKAY Industries, M/s Carbonaire, M/s Calstar Steel Limited, M/S Black**	Remarks at Annexure-I	One Ubbelohde type Viscometer as per ISO 307, complying with the requirements of size No. 2 of ISO 3105, for measuring viscosity number with the use of sulphuric acid should be available.

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
			Burn & Co. Pvt. Ltd, M/s Moulded Fibreglass Products & M/s Polyset		
	3.15	Apparatus for measuring surface roughness in 'Ra' should be available.	**Comments of M/s Polyset**		Apparatus for measuring surface roughness in 'Ra' should be available.
	3.16	One RAL shade card should be available	**Comments of M/s Polyset & M/s Avadh Rail Infra Ltd:**		~~One RAL shade card should be available~~. Colorimeter or spectrophotometer should be available to measure RAL
4.0	**QUALITY CONTROL REQUIREMENTS**				
	4.1	There should be a system to ensure the traceability of the product from raw material stage to finished product stage. This system should also facilitate to identify the raw material composition from the finish product stage.	No comments/Suggestions from approved/ developmental vendors has been received	No change	There should be a system to ensure the traceability of the product from raw material stage to finished product stage. This system should also facilitate to identify the raw material composition from the finish product stage.
	4.2	Ensure that the system of First-in First-out is followed for raw material and the intermediate stage products.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Ensure that the system of First-in First-out is followed for raw material and the intermediate stage products.
	4.3	Ensure that there is a Quality Assurance for the product detailing various aspects • Organisational Chart • Flow process chart • Stage inspection details • Non conformities in various parameters & control over them The QAP shall be available as per the requirement details in ISO documents issued by RDSO/ Lucknow.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Ensure that there is a Quality Assurance for the product detailing various aspects • Organisational Chart • Flow process chart • Stage inspection details • Non conformities in various parameters & control over them The QAP shall be available as per the requirement details in ISO documents issued by RDSO/ Lucknow.
	4.4	There should be at least one plastic technologist having a minimum bachelor's degree in relevant field & 5 years experiences or a person with diploma in relevant field with 12 years experience. He should be free from day-to-day production, testing & quality control responsibility. He should be mainly responsible for development and regular production of the	No comments/Suggestions from approved/ developmental vendors has been received	No change	There should be at least one plastic technologist having a minimum bachelor's degree in relevant field & 5 years experiences or a person with diploma in relevant field with 12 years experience. He should be free from day-to-day production, testing & quality control responsibility. He should be mainly responsible

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		product, analysis of products, control over raw material, corrective action in case of difficulties in achieving the parameters.			for development and regular production of the product, analysis of products, control over raw material, corrective action in case of difficulties in achieving the parameters.
	4.5	Ensure that the in-charge of the quality control section is having a qualification of minimum bachelor's degree in the relevant field and have minimum five years experience or a diploma holder with minimum 8 years experience. He should be actively involved in day-to-day activities of quality control / stage inspection / compliance of QAP etc.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Ensure that the in-charge of the quality control section is having a qualification of minimum bachelor's degree in the relevant field and have minimum five years experience or a diploma holder with minimum 8 years experience. He should be actively involved in day-to-day activities of quality control / stage inspection / compliance of QAP etc.
	4.6	The firm should have acquired ISO: 9000 certification and the product for which an approval is sought should be broadly covered in the scope of the certification for manufacture and supply.	No comments/Suggestions from approved/ developmental vendors has been received	No change	The firm should have acquired ISO: 9000 certification and the product for which an approval is sought should be broadly covered in the scope of the certification for manufacture and supply.
	4.7	The quality manual of the firm for ISO: 9000 should clearly indicate at any stage the control over manufacturing and testing of the said railway product.	No comments/Suggestions from approved/ developmental vendors has been received	No change	The quality manual of the firm for ISO: 9000 should clearly indicate at any stage the control over manufacturing and testing of the said railway product.
	4.8	Ensure that proper analysis is being done on monthly basis to study the rejection at various internal stages and it is documented.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Ensure that proper analysis is being done on monthly basis to study the rejection at various internal stages and it is documented.
	4.9	Ensure that all the relevant drawings, specifications, IS, BS standards, ASTM, ISO and test methods are available with the firm.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Ensure that all the relevant drawings, specifications, IS, BS standards, ASTM, ISO and test methods are available with the firm.
	4.10	It is to be ensured that the dies and moulds are checked for accuracy for various critical predefined dimensions at least on weekly basis or after production of 500 pieces whichever is earlier and observations are recorded. The wear and tear of nozzle and barrels of injection moulding machine should also checked at least once in month or after 50,000 nos. production (whichever is earlier) & observation recorded & shall be rectified if warranted by such records.	**Comments of M/S Black Burn & Co. Pvt. Ltd, M/s Moulded Fibreglass Products, M/s Adinath Industries, M/s Parasnath Enterprises & M/s Polyset:**		It is to be ensured that the dies and moulds are checked for accuracy for various critical predefined dimensions at least on weekly basis or after production of 50000 pieces whichever is earlier and observations are recorded. The wear and tear of nozzle and barrels of injection moulding machine should also checked at least once in month or after 50,000 nos. production (whichever is earlier) & observation recorded & shall be rectified if warranted by such records.
	4.11	Training need should be identified for all concerned officials &	No comments/Suggestions from	No change	Training need should be identified for all concerned

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		regular training shall be organized & imparted on maintenance of machine, quality assurance, safety parameters etc. & records maintained.	approved/ developmental vendors has been received		officials & regular training shall be organized & imparted on maintenance of machine, quality assurance, safety parameters etc. & records maintained.
C	**PROFORMA FOR TECHNICAL CAPABILITY ASSESSMENT FOR MANUFACTURE AND SUPPLY OF GFN/HVN LINERS DRAWING NO…….** (To be filled in duplicate. Attach extra sheets wherever necessary)				
	1.0	**SECTION-I : GENERAL INFORMATION(**For record purpose only**)**			
	1.1	Name of the firm:	No comments/Suggestions from approved/ developmental vendors has been received	No change	Name of the firm:
	1.2	Address: (a) Head Office (b) Works (c) Location of works …….Km. From ……Railway Station.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Address: (a) Head Office (b) Works (c) Location of works …….Km. From ……Railway Station.
	1.3	Factory Area (Sq.m): a)Covered b)Uncovered c)Is the factory site in your name or on rental basis? Support with documents. d)Telephone No./Mobile No. (i) Head Office (ii) Works e)Telegraphic /Telex/Fax/ E-mail ID address (i) Head Office (ii) Works	No comments/Suggestions from approved/ developmental vendors has been received	No change	Factory Area (Sq.m): a)Covered b)Uncovered c)Is the factory site in your name or on rental basis? Support with documents. d)Telephone No./Mobile No. (i) Head Office (ii) Works e)Telegraphic /Telex/Fax/ E-mail ID address (i) Head Office (ii) Works
	1.4	SSI/NSIC Registration No. (Enclose Copy):	No comments/Suggestions from approved/ developmental vendors has been received	No change	SSI/NSIC Registration No. (Enclose Copy):
	1.5	Power availability (KVA) (a) General allotted capacity (b) Standby generator and its capacity, if available. Diesel Generator of adequate capacity should be installed to take	No comments/Suggestions from approved/ developmental vendors has been received	No change	Power availability (KVA) (a) General allotted capacity (b) Standby generator and its capacity, if available. Diesel Generator of adequate capacity should be

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		up the load of the entire plant in case of power failure (c) Name the party/person in whose name the power is sanctioned and your agreement with the party/person (Support with documents)			installed to take up the load of the entire plant in case of power failure Name the party/person in whose name the power is sanctioned and your agreement with the party/person (Support with documents)
	1.6	Name of any other units located in the above premises. (As indicated in 1.3)	No comments/Suggestions from approved/ developmental vendors has been received	No change	
	1.7	Man Power Management: (a) Managerial staff (b) Shop floor Engineers/Supervisors (Their Nos. with their qualifications and service experience) (c) Laboratory In charge whether full time or part time. Indicate their names, qualifications and service experience (d) Inspection & quality control staff, (give their name, qualifications and service experience). (e) Workmen (i) Highly skilled (ii) Semi-skilled (iii) Un-skilled.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Man Power Management: (a) Managerial staff (b) Shop floor Engineers/Supervisors (Their Nos. with their qualifications and service experience) (c) Laboratory In charge whether full time or part time. Indicate their names, qualifications and service experience (d) Inspection & quality control staff, (give their name, qualifications and service experience). (e) Workmen (i) Highly skilled (ii) Semi-skilled (iii) Un-skilled.
	2.0	**SECTION-II: TECHNICAL INFORMATION** (Availability of Plant & Machinery as indicated by manufacturer should be physically verified by the assessment official)			
	2.1	Infrastructure for production and production capability	No comments/Suggestions from approved/ developmental vendors has been received	No change	Infrastructure for production and production capability
	2.1.1	Automatic screw type injection moulding machines: Indicate their: a) Their numbers b) Shot capacity of each machine c) Make of the machines	No comments/Suggestions from approved/ developmental vendors has been received	No change	Automatic screw type injection moulding machines: Indicate their: a) Their numbers b) Shot capacity of each machine c) Make of the machines

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		d) Age of each machine e) Automatic temperature control Device range Note: Preferably Horizontal screw type fully automatic PLC based injection-moulding machine should be available for moulding of min. 380gms shot(granuls) capacity.			d) Age of each machine e) Automatic temperature control Device range Note: Preferably Horizontal screw type fully automatic PLC based injection-moulding machine should be available for moulding of min. 380gms shot(granuls) capacity.
	2.1.2	De-humidifier with digital temperature, indicates: a) Number capacity b) Make c) Age d)Automatic temperature control device at 80-85°C range Note: De-humidifier with digital temperature and humidity controller & indicator of suitable capacity for pre-dehumidiation of raw material should be available. The unit shall be of sealed unit type so that granules after preheating is charged into the injection machine automatically by suction awarding and contact with ambient air.	No comments/Suggestions from approved/ developmental vendors has been received	No change	De-humidifier with digital temperature, indicates: a) Number capacity b) Make c) Age d)Automatic temperature control device at 80-85°C range Note: De-humidifier with digital temperature and humidity controller & indicator of suitable capacity for pre-dehumidiation of raw material should be available. The unit shall be of sealed unit type so that granules after preheating is charged into the injection machine automatically by suction awarding and contact with ambient air.
	2.1.3	Electrical (Thermoplastically controlled annealing baths capable of heating water upto 100°C) (a) Nos. (b) Size (c) Availability of thermostat facility and digital temperature indicator	No comments/Suggestions from approved/ developmental vendors has been received	No change	Electrical (Thermoplastically controlled annealing baths capable of heating water upto 100°C) (a) Nos. (b) Size (c) Availability of thermostat facility and digital temperature indicator
	2.1.4	Source of Raw material	No comments/Suggestions from approved/ developmental vendors has been received	No change	Source of Raw material
	2.1.5	Arrangement for storing of Raw material Note: Covered area with adequate space for storage of Raw material and finished product should be available which is free from dampness and humidity.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Arrangement for storing of Raw material Note: Covered area with adequate space for storage of Raw material and finished product should be available which is free from dampness and humidity.

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
	2.1.6	Tool room cum die making facilities: a)De-flashing tools of suitable design in adequate nos. to be available b)Minimum infrastructure for maintenance and polishing of dies & moulds should be available in-house	No comments/Suggestions from approved/ developmental vendors has been received	No change	Tool room cum die making facilities: a)De-flashing tools of suitable design in adequate nos. to be available b)Minimum infrastructure for maintenance and polishing of dies & moulds should be available in-house
	2.1.7	Any other facilities which the firm considers relevant	No comments/Suggestions from approved/ developmental vendors has been received	No change	Any other facilities which the firm considers relevant
	2.1.8	Rated production capacity per month	No comments/Suggestions from approved/ developmental vendors has been received	No change	Rated production capacity per month
	2.1.9	Describe arrangement for storing finished product, batch wise to avoid mixing: Note: Covered area with adequate space for storage of raw material and finished product should be available which is free from dampness and humidity. They should have separate damp free secured bond room with adequate space for accommodating at least 50,000nos. of such finished product.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Describe arrangement for storing finished product, batch wise to avoid mixing: Note: Covered area with adequate space for storage of raw material and finished product should be available which is free from dampness and humidity. They should have separate damp free secured bond room with adequate space for accommodating at least 50,000nos. of such finished product.
	2.2	Test facilities cum quality control steps.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Test facilities cum quality control steps.
	2.2.1	Laboratory room (i)Size of room. (ii)Air conditioning arrangement for controlling temperature and humidity in the room.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Laboratory room (i)Size of room. (ii)Air conditioning arrangement for controlling temperature and humidity in the room.
	2.2.2	Laboratory equipment/ test facilities indicate availability of the following equipment/ test facilities. All equipments should be in working order:			
	2.2.3	**SN** **Test** **Requirement** **Indicate**	**Comments of M/S Black**	Remarks at Annexure-I	**SN** **Test** **Requirement** **Indicate**

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'

			availability
2.2.2.1	Test facilities for tensile strength	Test method as per ASTM D-638-14, Computerised Tensile testing machine i) Type ii) Make iii) Age iv) Capacity: 2.5M/T(min.) v) Operating speed 1.5mm/min, 5.0mm/min, 50mm/min	
2.2.2.2	Test facilities for cross breaking strength	Test method as per IS:1998-1962	
2.2.2.3	Testing facility for Melting point test	Test Method as per IS:5762-1970 or capillary method apparatus	
2.2.2.4	Specific gravity test	Test method as per BS EN ISO 1183-1:2019 i) Single pan chemical balance (Accuracy: 0.1mg) ii) Beakers etc.	
2.2.2.5	Hardness test	Test method as per ASTM-D-785-08(Hardness tester Rockwell)	
2.2.2.6	Facility for check on glass filler by ash (%)	i) Single pan chemical balance (accuracy: 0.1mg) ii) Muffle furnace, temp. 1000°C iii) Desiccators	

Burn & Co. Pvt. Ltd, ii) M/s Moulded Fibreglass Products, M/s Adinath Industries &)M/s Parasnath Enterprises:

			availability
2.2.2.1	Test facilities for tensile strength	Test method as per ASTM D-638-14, Computerised Tensile testing machine vi) Type vii) Make viii) Age ix) Capacity: 2.5M/T(min.) x) Operating speed 1.5mm/min, 5.0mm/min, 50mm/min	
2.2.2.2	Test facilities for cross breaking strength	Test method as per IS:1998-1962	
2.2.2.3	Testing facility for Melting point test	Test Method as per IS:5762-1970 or capillary method apparatus	
2.2.2.4	Specific gravity test	Test method as per BS EN ISO 1183-1:2019 iii) Single pan chemical balance (Accuracy: 0.1mg) iv) Beakers etc.	
2.2.2.5	Hardness test	Test method as per ASTM-D-785-08(Hardness tester Rockwell)	
2.2.2.6	Facility for check on glass filler by ash (%)	v) Single pan chemical balance (accuracy: 0.1mg) vi) Muffle furnace, temp. 1000°C vii) Desiccators	

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'

		iv) Crucibles		
2.2.2.7	Facility for Cross-breaking load test for GFN liners	Compression testing machine & arrangement as per IRST for liners.(Attach drawing of test fixture and loading arrangement)		
2.2.2.8	Facility for compressive load for GFN liners	-Do-		
2.2.2.9	Facility for measurement of Viscosity number of HVN	One Viscometer of size no. 2 complying with the requirements of ISO 3105.		
2.2.2.10	Facility for checking of surface of Liner	Apparatus for measuring surface roughness in Ra		
2.2.2.11	Facility for checking color code of Liner	RAL shade Card		
2.2.2.12	Gauge for dimensional check	Minimum two sets as per RDSO drawing		
2.2.3	In house facility for checking calibration of tensile testing machine	Min. 5t capacity tension/ compression proving ring calibrated by NABL or other Govt. approved test house with suitable fixing links.		
2.2.4	Facilities for measuring through 3D laser.			
2.2.5	Periodicity of checking calibration of equipment			

		viii) Crucibles		
2.2.2.7	Facility for Cross-breaking load test for GFN liners	Compression testing machine & arrangement as per IRST for liners.(Attach drawing of test fixture and loading arrangement)		
2.2.2.8	Facility for compressive load for GFN liners	-Do-		
2.2.2.9	Facility for measurement of Viscosity number of HVN	One Ubbelohde Viscometer as per ISO 307, of size no. 2 complying with the requirements of ISO 3105.		
2.2.2.10	Facility for checking of surface of Liner	Apparatus for measuring surface roughness in Ra		
2.2.2.11	Facility for checking color code of Liner	~~RAL shade Card.~~ Colorimeter or spectrophotometer should be available to measure RAL		
2.2.2.12	Gauge for dimensional check	Minimum two sets as per RDSO drawing		
2.2.2.12	Fixture for Flexural Strength Test	As per Annexure-X of IRS T-44		
2.2.3	In house facility for checking	Min. 5t capacity tension/ compression proving ring calibrated by NABL or other		

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		<table><tr><td></td><td>and agency deployed for checking calibration:</td><td></td></tr><tr><td>2.2.6</td><td>Do you undertake the raw material identification tests before its use? Or depend upon the supplier's certificate</td><td></td></tr></table>			<table><tr><td></td><td>calibration of tensile testing machine</td><td>Govt. approved test house with suitable fixing links.</td><td></td><td></td></tr><tr><td>2.2.4</td><td colspan="3">Facilities for measuring through 3D laser.</td><td></td><td></td></tr><tr><td>2.2.5</td><td colspan="3">Periodicity of checking calibration of equipment and agency deployed for checking calibration:</td><td></td><td></td></tr><tr><td>2.2.6</td><td colspan="3">Do you undertake the raw material identification tests before its use? Or depend upon the supplier's certificate</td><td></td><td></td></tr><tr><td>2.2.7</td><td colspan="3">Facilities for Flexural Strength test</td><td></td><td></td></tr></table>
	2.2.7	Staff strength: a. Production staff b. Quality assurance: (Production stage, Lab Testing) i) Staff for quality monitoring in production stage ii) Staff for laboratory testing	No comments/Suggestions from approved/ developmental vendors has been received	No change	Staff strength: a. Production staff b. Quality assurance: (Production stage, Lab Testing) i) Staff for quality monitoring in production stage ii) Staff for laboratory testing
	2.2.8	Do you possess the relevant standards (BS, ASTM, BIS/ IS) as referred in IRS Specification for GFN Liner. Please list these as per availability.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Do you possess the relevant standards (BS, ASTM, BIS/ IS) as referred in IRS Specification for GFN Liner. Please list these as per availability.
	2.2.9	Describe (in a separate sheet) the various steps for stage inspections for quality monitoring and control during production. The quality assurance programme (including the proforma for maintenance of records) proposed to be adopted for the product, should be submitted.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Describe (in a separate sheet) the various steps for stage inspections for quality monitoring and control during production. The quality assurance programme (including the proforma for maintenance of records) proposed to be adopted for the product, should be submitted.
	3.0	**SECTION-III: EXPERIENCE** (For records purpose only)			
	3.1	Indicate various types of items being manufactured in your works and the name of the agency / client for whom it is being manufactured.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Indicate various types of items being manufactured in your works and the name of the agency / client for whom it is being manufactured.
	3.2	Indicate important customers for the last three years both Govt.	No comments/Suggestions from approved/ developmental	No change	Indicate important customers for the last three years both Govt. and non Govt. if any, for information

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		and non Govt. if any, for information furnished in your reply to 3.1.	vendors has been received		furnished in your reply to 3.1.
	3.3	Indicate details (contract reference, item and quantity manufactured and supplies of important orders executed in the past three years for the following. Indicate the inspecting agency for each i) Govt. Department, Central, State and Govt. undertaking other than Railway ii) Directly to the Railways. iii) Outside important firms.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Indicate details (contract reference, item and quantity manufactured and supplies of important orders executed in the past three years for the following. Indicate the inspecting agency for each i) Govt. Department, Central, State and Govt. undertaking other than Railway ii) Directly to the Railways. iii) Outside important firms.
	3.4	Please specify current orders in hand on your firm (Contract reference, client, item, quantity under manufacture and supply)	No comments/Suggestions from approved/ developmental vendors has been received	No change	Please specify current orders in hand on your firm (Contract reference, client, item, quantity under manufacture and supply)
	3.5	Whether ~~you are~~ firm is already registered with RDSO for other P.Way items. If so, name the item supported by documents.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Whether ~~you are~~ firm is already registered with RDSO for other P.Way items. If so, name the item supported by documents.
	3.6	Whether ~~you are~~ firm is already registered with RDSO for items other than P.way items. If so, name the item with which you are registered, supported by documents.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Whether ~~you are~~ firm is already registered with RDSO for items other than P.way items. If so, name the item with which you are registered, supported by documents.
	3.7	Indicate annual turnover of your company.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Indicate annual turnover of your company.
	4.0	**DECLARATION**			
	4.1	We do hereby declare that the above particulars are correct and no discrepancy shall be found during actual investigation before and during execution of order on our firm.	No comments/Suggestions from approved/ developmental vendors has been received	No change	We do hereby declare that the above particulars are correct and no discrepancy shall be found during actual investigation before and during execution of order on our firm.
	4.2	Any change in the plant and machinery and change of place of office and of works site shall be brought to the notice of RDSO for clearance and approval.	No comments/Suggestions from approved/ developmental vendors has been received	No change	Any change in the plant and machinery and change of place of office and of works site shall be brought to the notice of RDSO for clearance and approval.
	4.3	We also declare that our concern has not been black-listed by	No comments/Suggestions from	No change	We also declare that our concern has not been black-

SN	Para	Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'	Comments of Stake holders	RDSO's Remarks	Final Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'
		Railways / Railway Board/RDSO for business with the Railways.	approved/ developmental vendors has been received		listed by Railways / Railway Board/RDSO for business with the Railways.
	4.4	We hereby undertake that all our equipments for manufacturing and testing as listed above shall be maintained in good working order at all times.	No comments/Suggestions from approved/ developmental vendors has been received	No change	We hereby undertake that all our equipments for manufacturing and testing as listed above shall be maintained in good working order at all times.
	4.5	We hereby declare that the contents and the instructions of latest "Apex ISO document for Vendor Approval" issued by RDSO have been read and understood by us and our firm shall agree to abide by all the stipulations laid therein.	No comments/Suggestions from approved/ developmental vendors has been received	No change	We hereby declare that the contents and the instructions of latest "Apex ISO document for Vendor Approval" issued by RDSO have been read and understood by us and our firm shall agree to abide by all the stipulations laid therein.

Annexure

Draft Item Specific guidelines & Schedule of Technical Requirements for manufacture and supply of Glass Filled Nylon-66 (GFN) & High Viscous Nylon-66 (HVN) Insulating Liners, Documents no. TDG 0005 Rev. '2'

<table>
<tr><th>Para No.`</th><th colspan="2">Para of Draft Item Specific guidelines & Schedule of Technical Requirements</th><th>Comments of Stake holders</th><th>RDSO's Remarks</th></tr>
<tr><td>7.0</td><td>Responsibility and Authority</td><td>
<table>
<tr><td></td><td>Activity</td><td>Responsible</td><td>Approver</td><td>Supporting</td><td>Consulted</td><td>Informed</td><td></td></tr>
<tr><td></td><td>Creation, maintenance ofthis document</td><td>ED/Track-II/ Director / Track-IV</td><td>PED/ Track Design</td><td>DD/AIE / ADE</td><td>M&C Dte.</td><td>All approved vendors through website</td><td></td></tr>
<tr><td></td><td>Compliance of directives contained in this document</td><td>DD/ AIE/ ADE</td><td>Director/ Track Design -IV</td><td>-</td><td>-</td><td>-</td><td></td></tr>
<tr><td></td><td>Requirement of deviation from this directive</td><td>ED/Track-II/ Director/Track-IV</td><td>PED/ Track Design</td><td>DD/AIE / ADE</td><td>M&C Dte.</td><td>-</td><td></td></tr>
</table>
Abbreviations
<table>
<tr><td>PED/Track Design</td><td>Principal Executive Director/ Track Design</td></tr>
<tr><td>ED/Track-III</td><td>Executive Director/Track Design-III</td></tr>
<tr><td>RDSO</td><td>Research Designs & Standards Organizatio</td></tr>
<tr><td>DD</td><td>Dy. Director</td></tr>
<tr><td>AIE</td><td>Assistant Inspecting Engineer</td></tr>
<tr><td>ADE</td><td>Assistant Design Engineer</td></tr>
</table>
</td><td>Comments of M/S Black Burn & Co. Pvt. Ltd
In the table on page 3 under abbreviations, ED/Track III is mentioned. Will it be ED/Track II?</td><td>Table has been corrected</td></tr>
<tr><td>8.0</td><td>The process of approval of Glass Filled Nylon-66 Insulating</td><td>i) Vendor seeking fresh registration for the particular item (GFN/HVN) shall register online on UVAM portal website https://www.ireps.gov.in.
ii) Submit duly filled-in online fresh application form along with vendor registration charges as applicable at the time</td><td>Comments of M/s Industrial Components Industries & M/s Polymer Products of India:

Field trial for validation of product has not been included in the vendor approval process. As per the EOI, field trials for 12 months</td><td>

The comments of the firm have been examined and the para has been</td></tr>
</table>

	Liners and High Viscous Nylon-66 Insulating Liners will involve following steps / activities.	of submission.	period is required in view of critical nature of item. In this regard, please refer the following: **i) Clause No. 4.8.1, ISO Document No. QO-D-8.1-6:** "While registering Vendor in Developmental Category, if concerned ED/PED feels that approval of prototype / Sample is required or any trial is required or both are required then suitable check note may be given in remarks column of vendor directory that before making bulk supply against any orders placed by Railways, Technical Clearance of Prototype/Test sample and successful field trials as specified for item by RDSO is to be completed". **ii)Page No.15 of EOI No. CT/EF/Policy/Global RFP/ HVN dated 05.03.2019):** "Performance of HVN Liner shall be monitored jointly normally up to 1 year by zonal railways with representative of supplying firms. RDSO will also associate during joint monitoring of the trial as per the need. However, the monitoring period can be extended further by the Railway Administration, if required to obtain conclusive data. After successful field trial of HVN Liner, the adoption of HVN Liner will be dealt as per Railway Board letter no. 2013/Tk–II/22/7/4 (General Policy) dated 08.03.2016." **iii) Railway Board Letter No. 2013/Tk-II/22/7/4 (General Policy) dated 08.03.2016 regarding New Policy on development and adoption of new product / technologies for track/bridge related items:** "The limited field trial may be ordered in limited quantity on 5 to 10 zonal railways covering diverse geographical, climatic, and operating conditions, for a period of one year so that the product efficacy is evaluated covering one full weather cycle for one year. The trial should generally cover stretches with sharp curves, steep gradients, heavy density routes, coastal areas etc. so as to represent different operating conditions which the product process / technology / design is likely to encounter during regular use" No relaxation in the application process for HVN Liners has been	revised.
		iii) Upload the document as mentioned along with QAP and legal documents for technical approval by this office.		
		iv) The specification & relevant drawings are available on RDSO website & UVAM portal and same can be downloaded from RDSO website. The charges of these documents are included in fresh registration charges and no need to deposit separate charges for these documents at the first time.		This is not a suggestion
		v) Application/ proforma along with documents & charges will be scrutinized by RDSO and if details are found satisfactory, the works unit of the firm will be visited for Capability Assessment.		This is not a suggestion
		vi) If any shortcomings are observed during the visit, the same will be conveyed to the firm for their compliance.		
		vii) After satisfactory compliance by the firm, the firm is shall be advised to submit gauge checking charges and Inspection gauges of the drawings for the particular item applied for. Glass Filled Nylon-66 Insulating .Inspection gauges will be checked and approved prior to/ during STR verification visit.		
		viii) After satisfactory verification of documents and CCA (Capacity cum Capability Assessment), the name of the firm shall be considered to be placed in the "List of RDSO vendors for Developmental order" for 24 months period subject to technical clearance of Prototype/ Test samples and its approval by the RDSO (to be mentioned in check note in Vendor directory).		
		ix) After clearance / approval of two sets of inspection gauges as mentioned in para (vii) above, the firm would be advised to start trial production and to submit internal test results in formats as per Quality Assurance Programme (QAP) for manufacture and testing. If the internal test results are found satisfactory, the firm would be advised		This is not a suggestion

		for drawl of samples manufactured in presence of RDSO official from their works.	given to those firms whose samples have already been passed and field trial for 12 months has already been completed. In this regard, please refer the following: **i) Clause No. 4.4, ISO Document No. QO-D-8.1-7 Version No.: 1.2 Date Effective: 28/07/2022** "There are some applicants which may already be registered with some reputed units for the same item for which application has been submitted to RDSO, like Metro Rail Corporations, Power Grid Corporations, Ordinance Factories or DFCCL, Central PSUs etc. On registration by vendor on the UVAM portal, the document submitted by the vendor shall be scrutinized for the compliance of the specification and other requirements. Verification of registration documents with concerned PSU/s for same item as mentioned above shall be done. Vendor shall submit para– wise compliance of specification and deviation if any with mitigation measure/ alternate provision. Dispensation may be given by the ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level) based on the importance of provision and effectiveness of mitigation measure/alternate provision. Directorate may issue a detailed guideline in this regard to ensure transparency. On satisfactory compliance of documents and other requirements, ED controlling the item (when final decision is taken at ED level)/ PED of Vertical (where final decision is taken at PED level) may waive prototype requirements and/or trial requirements in addition to CCA and the vendor can be directly placed in developmental vendor category. In deserving cases, after application of mind and recording reasons, especially if developed vendors are less than three and such vendor is considered capable based on satisfactory supply performance in such PSUs, the vendor may be placed in regular approved vendor category in Vendor Directory. Cross approval policy may be followed where it exists/applicable." All the desired data has been submitted to RDSO, prototype samples testing done by RDSO as well as Govt. approved lab and field trial of this item has been completed. **ii) ISO Document No. QO-D-8.1-15 Version No.: 1.3 Date Effective: 03.10.2022, Clause No. 4.2, Case 2: Product is not available but**	
		x) The testing of the samples drawn will be carried out as per clause laid down in IRS specification for Glass Filled Nylon-66 & High Viscous Nylon-66 Insulating Liners, Sl. No. T-44-2020. If test report is found satisfactory and other conditions are fulfilled, the conditional check note in Vendor directory as mentioned in para viii above shall be removed. The firm will be advised to start production of the product. If implementation of QAP is found satisfactory, the purchaser may be advised to get the inspection of the product initial quantity by RDSO/nominated inspecting agency and regular quantity by ~~RITES~~ nominated inspecting agency.		This is not a suggestion
		xi) In the case of new Vendor/firms the process of approval will be initiated only if the firm has applied on-line or has been placed with developmental order from Zonal Railways/ Railway Board or given go ahead from RDSO as per instructions /guidelines of Railway Board from time to time. Rest of the procedure for approval will be the same as detailed in para1.0 above.		
		xii) In case, firms approved for manufacturing of ~~Glass~~ Filled~~ Nylon 66 Insulating Liners to~~ one drawing for a particular item (GFN/HVN), desires to develop the product to other drawings for the same item, the requisite inspection gauges will have to be approved by RDSO. After getting satisfactory internal test reports, the samples will be drawn and tested at RDSO. If test results on samples found satisfactory, the firm would be considered for inclusion in the "List of RDSO Vendors for Developmental Orders" as per the provisions of latest ISO apex documents.		
		xiii) Up-gradation from "List of RDSO Vendors for Developmental Orders" to "List of Approved Vendors" shall be as per procedure mentioned in RDSO's latest ISO apex document.		

			manufacturers for similar items exist: "The firm who have successfully developed the product through this process of product development shall be listed on the RDSO's 'List of Approved Vendors' or 'List of RDSO vendors for developmental orders' as applicable. They shall be exempted from payment of vendor registration fee." **i) M/S Black Burn & Co. Pvt. Ltd** Will existing vendors of GFN liners need to seek fresh approval?	Yes, as the raw material for HVN liner is totally deferent from GFN liner, therefore existing vendors of GFN liners need to seek fresh approval
A	**ITEM SPECIFIC GUIDELINES**			
	2.5	The samples will be left in sealed condition with the firm and it shall be the responsibility of firm to deliver the same to RDSO (M&C Dte.) within 15 days from the date of drawl of samples. The samples along with a set of approved gauges shall be sent to RDSO, with a letter addressed to the Director General/M&C RDSO, Lucknow and copy to the Director General/Track, RDSO, Lucknow.	**Comments of M/S Black Burn & Co. Pvt. Ltd:** It is requested that one extra set of samples is left in sealed condition with the firm. This is to safeguard that in case the first samples do not reach RDSO for reasons beyond the control of the vendor, the 2nd set can be sent without going through the entire process of sample drawl again.	The suggestion of the firm is not accepted. as this may lead to ambiguity among the vendor and RDSO
B	**SCHEDULE OF TECHNICAL REQUIREMENTS OF FIRMS TO MANUFACTURE OF GFN-66 & HVN-66 LINERS**			
	2.2	De-humidifier with digital temperature and humidity controller & indicator of suitable capacity for pre-dehumidiation of raw material should be available.	**Comments of M/s Carbonaire :** Alternate drying machine namely, the most modern drying method for plastics – Low Pressure Vacuum drying equipment may also be used which ensures very low moisture content and will not damage the color master batch (due to heat) and maintains consistency. The equipment is imported from USA / Japan. This drying equipment does not use desiccant for drying and so no dew point is required to be measured. **Comments of M/S Black Burn & Co. Pvt. Ltd:** "& indicator of Dew point" should be mentioned instead of just "indicator"	The suggestion of the firm has been examined and modification in the para has been done. The suggestion of the firm has been examined and modification in the para has been done.
	2.6	Suitably designed dies & moulds for products (minimum 2 nos. for each size & drawing No.) should be available. Dies/moulds may be of two cavity or multi-cavity, but permission will be given for bulk production as per the cavity number used during approval time. It is mandatory to use hot runner moulds in case where manufacturer is	**Comments of M/s Polyset:** Only one set of moulds, for each size & drawing no. are sufficient at initial stage, any increase or upgradation can be considered after capacity assessment and overall demand. Technically, it is not advisable to use hot runner moulds to mould a thick product like insulating liner, a conventional (a balanced cold	Hot runner moulds is mandatory only for having more than 4 cavities, upto 4 cavities the firm can use conventional balanced cold runner system. Further, it is to mention that minimum

		using moulds having more than 4 cavities. However vendors who desire to use hot runner mould having four cavities or less is permitted.	runner system) is the best suited option from overall process control point of view It should be left to the discretion of the vendor to choose a runner system suited for their mold construction.	2 nos. mould for each size & drawing No is prerequisite for this item. Hence the suggestion is not accepted.
	2.9	The manufacturer should have all in-house arrangement for screen printing so that the products treated & finished inside the factory.	**Comments of M/s OKAY Industries:** We suggest that there is no need for an in-house screening printing facility since the products are already color coded and also the product will have embossed data for the drawing no. **Comments of M/s Carbonaire:** This may not be required since the liners are colored. We can put lot number in an interchangeable pin in the mold with numbers up to 10 **Comments of M/s Calstar Steel Limited:** We feel that railway that dispense with this requirement as the product is color coded drawing wise.	Facility of in-house arrangement screen printing is for GFN Liners only and not for HVN liners. -Do- -Do-
	3.5	Digital vernier calipers ~~and three-point digital bore gauges (Min.2 nos. of each)~~ should be available.	**Comments of M/s OKAY Industries :** We suggest that instead of a simple, digital vernier caliper, in view of the criticality of the product the firm must have a CMM (coordinate measuring machine) equipment.so that all critical dimensions can be measured for the product at plant during all inspections. This can be done on a sampling basis for every lot. **Comments of M/s Carbonaire :** Additionally, CMM (coordinate measuring machine) can be included	Regular dimensional checking is to be done with the approved gauge Digital vernier calipers is required for measuring the dimensional gauges as per drawing. -Do-
	3.13	3-D laser based equipment for measurement of critical dimensions (i.e. liner thickness, rib thickness and outer dimension) of GFN liners with facility for laser paint marking (green dots for dimensionally OK material and red dot for dimensionally not OK material) with provision for automatic segregation of pass and un-passed material shall be provided. The equipment shall be provided on	**Comments of M/s OKAY Industries :** Since we have suggested to have a CMM machine to measure all critical dimensions in clause 3.5, this requirement may be removed as it is already been covered during inspection in clause 3.5 **Comments of M/s Carbonaire :**	The comments of the firm has been examined and not accepted.

		production line (after annealing) itself.	3D based equipment. This process will not be feasible to do on a production scale. We propose that samples from the annealed lots be taken in a selected frequency and check for the critical dimensions. The same can be measured and recorded. **Comments of M/s Calstar Steel Limited:** Annealing of liner is a batch process and there is no scope of a production line past annealing. As such this will only add to cost without giving any real benefit. **Comments of M/s Unique Plastic Industries:** We would like to propose a removal of this requirement from the STR. All parameters are constantly checked an monitored at every step of the manufacturing. This is an unnecessary requirement. Also , given the new range of colours it will become more difficult to identify the markings for automatic segregation. **Comments of M/S Black Burn & Co. Pvt. Ltd, M/s Moulded Fibreglass Products, M/s Adinath Industries & M/s Parasnath Enterprises** RDSO has been asking for this facility for a long time now and to the best of our knowledge none of the existing vendors have been able to set up the same. Many manufacturers have been contacted but none have been able to offer the desired equipment. RDSO may suggest a suitable manufacturer from whom such equipment can be purchased or developed. **Comments of M/s Polyset:** A Co-ordinate Measurement Machine (CMM) is used for measurement of critical dimension of the molded part, like liner. The clause for having 3-D laser-based equipment is not clear and therefore, instead of a laser-based dimension measurement equipment, a suitable Co-ordinate Measurement Machine (CMM) should be included.	

			Also, frequency of dimension measurement should be mentioned (for example, 1 in 10,000 pcs). It should also be mentioned if the dimensional measurements should be taken on As Moulded Liners or on Annealed Liners. CMM machine is required to be kept in dust free environment and hence it can't be in the production line. This amendment should be included. **Comments of M/s Avadh Rail Infra Ltd:** CMM (Co-ordinate Measuring Machine) could be included for pilot lot inspection in place of 3D Laser based measuring equipment before going to mass production. As 1.OOV> critical dimension of the product checked by the gauge at the time of production. The close injection mould is used to manufacture the HVN linear, so the chances of dimension variation is negligible which will in acceptable limit.	
	3.14	One Viscometer of size no. 2 complying with the requirements of ISO 3105, for measuring viscosity number should be available.	**Comments of M/s OKAY Industries :** The spec ISO 3105 is a general viscosity method for all materials. However, for Polyamide (HVN and all other Nylons), ISO 307 is the more relevant standard. The same spec and standard is used by raw material manufacturers and a test certificate for the same is issued by the raw material supplier for every lot. The viscosity testing apparatus may be computerized and digital reports can be submitted for the same. **Comments of M/s Carbonaire :** The specification ISO 3105 is a method for checking viscosity of all materials. However, for polyamide (Nylon) ISO 307 is applicable. The same specs are used by raw material manufacturer and test certificate issued. The viscosity can be tested using a computerized equipment without manual intervention **Comments of M/s Calstar Steel Limited:**	The comments of the firm has been examined and para has been revised The comments of the firm has been examined and para has been revised The comments of the firm has been

			We would like to suggest an alternative viscosity testing method ISO 307 which is more suitable for testing polyamides. **Comments of M/S Black Burn & Co. Pvt. Ltd & M/s Moulded Fibreglass Products:** This may please be amended as below so as to indicate availability of entire apparatus and not just the Viscometer:- "Viscosity measuring equipment consisting of constant temperature bath as per the requirements laid down in ISO 307 should be available along with at least one Viscometer of size no. 2 complying with the requirements of ISO 3105". **Comments of M/s Polyset:** Since Viscosity is one of the only and most important measurable property of HVN liners which are different from other types of Nylon, it is important to mention detailed test method to be used for measurement of viscosity of HVN liners. It should also be mentioned, which type of Viscometer should be used and what kind of display should be installed to take the measurements. ISO 307 corresponds to viscosity measurement of Polyamides and ISO 307 should be adopted for measurement of viscosity of HVN. Since there are several types of viscometers used for measurement of viscosity of Polyamide, one type of viscometer should be specified to ensure standardization of test. Ubbelohde viscometer is the most standard viscometer used for measurement of viscosity of Polyamides and hence Ubbelohde viscometer with appropriate solvent (acid concentration) should be specified.	examined and para has been revised The comments of the firm has been examined and para has been revised The comments of the firm has been examined and para has been revised

	3.15	Apparatus for measuring surface roughness in 'Ra' should be available.	**Comments of M/s Polyset:** Details of apparatus for measurement of surface roughness should be mentioned to avoid any ambiguity of measurement between vendors and with third party laboratories.	There is some options for measurement of roughness in 'Ra' in prescribe range is available in market. Hence the firm can choose the correct measuring instrument.
	3.16	One RAL shade card should be available	**Comments of M/s Polyset:** Since the specification is asking for supply of pre-coloured HVN liners with addition of UV stabilised colour masterbatch, it is important to include measurement of RAL colour shade using a measurement instrument. Merely matching of colour shade of moulded liners with RAL colour shade card, manually, will lead to human error and possible passing of spurious material. Any manual measurement may also lead to conflict of acceptance or non-acceptance of the moulded liners between inspecting authorities and the vendors. Use of standard equipment like colorimeter or spectrophotometer should be specified to measure RAL color shade of the molded HVN liners. **Comments of M/s Avadh Rail Infra Ltd:** Colour measurement should on a spectrometer and measurement criteria should be define.	The comments of the firm has been examined and an equipment has been added for measuring RAL colour The comments of the firm has been examined and an equipment has been added for measuring RAL colour
	4.10	It is to be ensured that the dies and moulds are checked for accuracy for various critical predefined dimensions at least on weekly basis or after production of 500 pieces whichever is earlier and observations are recorded. The wear and tear of nozzle and barrels of injection moulding machine should also checked at least once in month or after 50,000 nos. production (whichever is earlier) & observation recorded & shall be rectified if warranted by such records.	**Comments of M/S Black Burn & Co. Pvt. Ltd & M/s Moulded Fibreglass Products:** This is not needed and request for deletion. **Comments of M/s Adinath Industries & M/s Parasnath Enterprises:** The dies and moulds are checked for accuracy for various critical predefined dimensions at least once in a month and records to be recorded. Similarly, the wear and tear of nozzle and barrels of injection moulding machine should check in every 3 months and reports to be maintained. **Comments of M/s Polyset:** Injections moulds are made from hardened steel for continuous production. There is no need to keep checking accuracy after every	This is for maintenance purpose only. The comments of the firm has been examined and para has been revised The comments of the firm has been

<table>
<tr><td></td><td></td><td></td><td>500 pieces. Any such assessment should be undertaken at the time of re-assessment of the vendor.</td><td>examined and para has been revised</td></tr>
<tr><td><u>C</u></td><td colspan="4">PROFORMA FOR TECHNICAL CAPABILITY ASSESSMENT FOR MANUFACTURE AND SUPPLY OF GFN/HVN LINERS DRAWING NO…….
(To be filled in duplicate. Attach extra sheets wherever necessary)</td></tr>
<tr><td></td><td>2.2.3</td><td colspan="2"><table>
<tr><th>SN</th><th>Test</th><th>Requirement</th><th>Indicate availability</th><th></th></tr>
<tr><td>2.2.2.1</td><td>Test facilities for tensile strength</td><td>Test method as per ASTM D-638-14, Computerised Tensile testing machine
i) Type
ii) Make
iii) Age
iv) Capacity: 2.5M/T(min.)
v) Operating speed 1.5mm/min, 5.0mm/min, 50mm/min</td><td></td><td></td></tr>
<tr><td>2.2.2.2</td><td>Test facilities for cross breaking strength</td><td>Test method as per IS:1998-1962</td><td></td><td></td></tr>
<tr><td>2.2.2.3</td><td>Testing facility for Melting point test</td><td>Test Method as per IS:5762-1970
or capillary method apparatus</td><td></td><td></td></tr>
<tr><td>2.2.2.4</td><td>Specific gravity test</td><td>Test method as per BS EN ISO 1183-1:2019
i) Single pan chemical balance (Accuracy: 0.1mg)
ii) Beakers etc.</td><td></td><td></td></tr>
<tr><td>2.2.2.5</td><td>Hardness test</td><td>Test method as per ASTM-D-785-08(Hardness tester Rockwell)</td><td></td><td></td></tr>
<tr><td>2.2.2.6</td><td>Facility for check on glass filler by ash (%)</td><td>i) Single pan chemical balance (accuracy: 0.1mg)
ii) Muffle furnace, temp. 1000°C
iii) Desiccators
iv) Crucibles</td><td></td><td></td></tr>
</table></td><td>Comments of M/S Black Burn & Co. Pvt. Ltd & M/s Moulded Fibreglass Products:

Facility for measuring through 3D laser may please be deleted and test facility for Flexural Modulus test may be added

Comments of M/s Adinath Industries & M/s Parasnath Enterprises:
Facility for test facility for Flexural Strength test may be added in the STR</td><td>Comments of the firms is accepted. Accordingly, para has been modified</td></tr>
</table>

			2.2.2.7	Facility for Cross-breaking load test for GFN liners	Compression testing machine & arrangement as per IRST for liners.(Attach drawing of test fixture and loading arrangement)				
			2.2.2.8	Facility for compressive load for GFN liners	-Do-				
			2.2.2.9	Facility for measurement of Viscosity number of HVN	One Viscometer of size no. 2 complying with the requirements of ISO 3105.				
			2.2.2.10	Facility for checking of surface of Liner	Apparatus for measuring surface roughness in Ra				
			2.2.2.11	Facility for checking color code of Liner	RAL shade Card				
			2.2.2.12	Gauge for dimensional check	Minimum two sets as per RDSO drawing				
			2.2.3	In house facility for checking calibration of tensile testing machine	Min. 5t capacity tension/ compression proving ring calibrated by NABL or other Govt. approved test house with suitable fixing links.				
			2.2.4	Facilities for measuring through 3D laser.					
			2.2.5	Periodicity of checking calibration of equipment and agency deployed for checking calibration:					
			2.2.6	Do you undertake the raw material identification tests before its use? Or depend upon the supplier's certificate					