

Comments received by the manufacturers/supplier on the draft specification no. RDSO/PE/SPEC/0197-2020 (Rev-1) for bellow duct

Manufacture: concord pvt ltd

CLAUSE NO OF RDSO SPECIFICATION/STR	CLAUSE, AS IT EXISTS RDSO SPECIFICATION/S TR	SUGGESTION In THE RDSO SPECIFICATION/STR	RDSO Remarks
5.2	1- Limiting oxygen index as per test method IS 13501 acceptable unit 38 2- Toxicity (CIT) conventional index of Toxiicty (at 50KW/m2) test method EN 455545-2 Acceptable limit ≤ 0.1	These Test parameters are already covered under the Scope of testing for Flame Retardancy Test according to R1/HL3 Grade of EN45545-2 standard. Therefore, these test parameters should not be included additionally in fabric testing requirements, as the same is redundant.	NOT ACCEPTED The details mentioned in the clause are sufficient and no modification is required
Comments Related to RDSO Drawing No. RDSO/PE/SK/AC/0069 – 2004 (Rev-3).		<ol style="list-style-type: none"> 1- It has been observed that the RDSO drawing only specifies the frame dimensions. We have received multiple queries from TPI inspection engineers regarding the clarification of whether the bellow cloth should be fitted from the outside or the inside. We suggest that the RDSO drawing be amended to include the following note: “Fabric fitment is subjected to the supplier's internal design and can be fitted inside or outside to meet the application requirements.” 2- At Note No. 19 of the RDSO drawing, the tolerance is specified in accordance with IS 2102 Part 1 (Medium). However, we recommend that the tolerance may please be revised to conform to IS 2102 Part 1 (Coarse). 3- In the RDSO drawing for the Metallic Frame for Supply Air RMPU Side, the vertical dimension of the bellow mounting hole (LHS) is specified as 135mm (i.e., measured from the inside edge to the hole), whereas this dimension should be the same as 	<ol style="list-style-type: none"> 1. ACCEPTED. The fabric is to be fitted from outside and the fabric is to be sandwiched with additional metal strips from all sides. The composite metal frame and bellow duct fabric arrangement is to be riveted properly. This has been included in the final draft specification. 2. The bellow duct is critical fitment item and will require medium level tolerance for accuracy hence NOT ACCEPTED. 3. ACCEPTED: The dimension of 135 mm is from top (exterior) to centre of the mounting hole and both RHS and LHS side are typographical error and will be modified in the next revision of OGA RMPU drawing no. RDSO/PE/SK/AC/0069-2004 (Rev3)

		mentioned on the RHS	
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Manufacture: M/s GVM Pvt Ltd

Clause of RDSO Spec RDSO/PE/SPEC/0197-2020 (Rev-1).	CLAUSE, AS IT EXISTS ROSO SPECIFICATION	Comments from firm	RDSO remark
1.5	The Bellow duct are used in Chair car and sleeper coaches, the fire safety for 45545-2 So this specification RDSO/PE/SPEC/0197 (rev 0) is being revised.	EN Standard shall be amended as EN 45545-2	ACCEPTED Necessary modifications have been made in the final draft
2.1	Unless otherwise specified in tender the manufacturer shall supply the coated fabric complete with metallic frames at both the ends of the duct i.e. RMPU side & coach shell side as per RDSO drawing No. RDSO/PE/SK/AC/0069-2004 (Rev.3), 2 nos. each for fresh air & return air and one no. for supply air per RMPU. EPDM (fire retardant) gasket for both RMPU and coach shell sides should also be supplied.	EPDM shall be amended as EPDM/ Silicon (Fire Retardant Gasket)	NOT ACCEPTED EPDM is widely accepted material for gaskets over Railways for its better wear and tear resistance.
4.0	UIC564-2 OR Regulations relating to fire fighting measures in passenger carrying Railway vehicles or assimilated vehicles used on international services.	UIC 564-2 OR standard needs to be removed completely since we are focusing on highest category of EN45545-2 HL-3 standards.	NOT ACCEPTED Deterioration of visibility due to smoke test is not covered in EN45545-2 standard.
5.2.2	Thickness(Max) Acceptable/grade=1.75	Acceptable limit/grade shall be amended as 1.75mm +/- 0.1 mm with tolerance	NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory.
5.2.3	Breaking strength (max) Acceptable/grade X-Direction=3000 Y-Direction=3000	Acceptable/grade shall be amended as minimum X-Direction=3000 Y-Direction=3000	ACCEPTED Necessary modifications have been made in the final draft

5.2.5	Resistance to spread of flame Test method/instrument/standards/specification/specification mentioned as Appendix-5 of UIC564-2 OR	Appendix-5 Of UIC564-2 OR needs to be removed completely since we are focusing on highest category of EN 45545-2 HL3 standards and it cover spread of flamer/smoke -Toxicity	NOT ACCEPTED The tests are not covered in R1 HL-3 category.
5.2.7	Toxicity, (CIT) Convevtional index of Toxicity (at 50Kw/m2 heat flux) acceptable limit/Grade= ≤ 0.1	Acceptable limit/Grade= ≤ 0.1 shall be amended as < 1.0 OR this parameter can be removed completely since we are focusing on highest category of EN45545-2 HL-3 standards which cover toxicity index	NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory.
5.2.8	Deterioration of visibility due to smoke test method/instrument/standards/ specification mentioned as appendix-5 of UIC564-2 Or	Appendix-5 of UIC564-2 or Needs to be removed completely since we are focusing on highest catagery of EN45545-2 HL3 standards and it cover spread of flame/ smoke- toxicity	NOT ACCEPTED The tests are not covered in R1 HL-3 category.
5.2.10	Weight(max) acceptable limit/Grade=2000	acceptable limit/Grade shall be amended as 2600	NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory.

Manufacture: RR electricals

Clause of RDSO Spec RDSO/PE/SPEC/0197-2020 (Rev-1)	Manufacturer comments	RDSO Remarks
1.5	Breaking strength(Max) 3000N instead mm of maximum it should be Minimum 3000 N	ACCEPTED Necessary modifications have been made in the final draft
5.3	Test should be done from NABL/ Govt. recognized/ILAC accreditation Co-operation through sufficient test facility is available in india, test must conducted in india	NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory

Manufacture: Satyanand Enterprises.

Clause of RDSO Spec RDSO/PE/SPEC/0197-2020 (Rev-1)	Manufacturer comments	RDSO Remarks
Clause 5.0 sub clause 5.2	Breaking strength(Max) 3000N instead mm of maximum it should be Minimum 3000 N	ACCEPTED Necessary modifications have been made in the final draft
5.3	Test should be done from NABL/ Govt. recognized/ILAC accreditation Co-operation through sufficient test facility is available in india, test must conducted in india	NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory

Manufacture: SA-KA-Tech (Submitted by M/s GVM Pvt Ltd):.

Clause of RDSO Spec RDSO/PE/SP EC/0197-2020 (Rev-1)	Manufacturer comments	Firm Remarks	RDSO Remarks
4.0	GOVERNING SPECIFICATIONS		NOT ACCEPTED The tests are not covered in R1 HL-3 category.
	Referenced Specification/ Document	Description	
	IS:13501	Determination of flammability by oxygen index	
	IS:7941	Method for determining the water repellency of fabrics by cone test	
		As Railway / RDSO are focusing on highest category of EN45545-2 HL3 standards which covers spread of flame/ smoke - Toxicity index which is widely used in European countries to maintain the highest fire safety standards hence naturally EN 45545-2 HL3 supersedes the UIC 564-2 standards. Listing of two standards in governing specification, will create confusion and the lower standard (UIC 564-2) can be	

	IS:391	Method for determining resistance to penetration by water of fabrics by hydrostatic head test	removed, for the confirmed adoption of EN 45545-2 HL3 only throughout the Indian Railway coach materials (like Flexible Bellows, Gangways, Window blinds, seats and any other connecting medium)	
	IS:1390	Methods for determination of pH value of aqueous extracts of textile materials		
	IS: 6911	Stainless steel plate, sheet and strip		
	ASTM D751	Standard test methods for coated fabrics.		
	UIC 564-2 OR	Regulations relating to firefighting measures in passenger carrying Railway vehicles or assimilated vehicles used on international services.		
	EN 45545-2	European Railway standard for fire safety		
5.0	TECHNICAL & CONSTRUCTIONAL REQUIREMENTS & TESTS			
5.1	Fabric of the bellow duct shall be of Meta Aramid/ Para aramid with silicon rubber coating on both sides		As Railway / RDSO are focusing on highest category of fire standards EN45545-2 HL3, RDSO should also consider the Duct bellow performance under environmental, Mechanical (Vibrations, Tensile strength) and Durability of the duct bellows material. As per the experience of Fire Safety Engineers, RDSO must consider that Para-aramid is having much better results/performance than Meta aramid. Hence we suggest to keep only Para Aramid with silicon coating on both sides.	NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory

5.2	Finished meta-aramid/ para-aramid fabric with silicon rubber coating on both sides shall have the following properties /parameters					<p>For Breaking Strength & Toxicity, (CIT) Conventional index of Toxicity (at 50 kW/m2 heat flux):</p> <p>ACCEPTED Necessary modifications have been made in the final draft.</p> <p>For Thickness, & Weight:</p> <p>NOT ACCEPTED The details mentioned in the clause are sufficient and self-explanatory</p> <p>For Resistance to spread of flame, Deterioration of visibility due to smoke:</p> <p>NOT ACCEPTED The tests are not covered in R1 HL-3 category.</p>
	S. No.	Parameters	Unit	Test method/ Instrument/ Standards/ Specification	Acceptable limit/grade	
	1.	Flame Retardant	Grade	EN 45545-2	R1/HL-1;R7/HL-2 R1/HL-3	
	2.	Thickness (min) (max)	Mm	ASTM D751	1.2 1.75	
	3.	Breaking Strength (max)	N	ASTM D751	X Direction- >800 X Direction =3000 Y Direction- >800 Y-Direction =3000	
	4.	Working temperature range	Deg. C	-	From -20 to +180	
	5	Resistance to spread of flame	-	Appendix5 of UIC 564-2 OR	Class – A	
	6	Limiting oxygen index (min.)	-	IS:13501	28	
	7	Toxicity, (CIT) Conventional	-	EN 45545-2	< 0.1	

		index of Toxicity (at 50 kW/m ² heat flux)				completely since RDSO is focusing on highest category of EN45545-2 HL3 / ISO 5659-2 CITG value less than or equal to 0.75	
	8	Deterioration of visibility due to smoke	-	Appendix5 of UIC 564-2 OR	Class - A	Appendix-5 of UIC 564-2 OR needs to be removed completely since RDSO is focusing on highest category of EN45545-2 HL3 / ISO 5659-2 Smoke value Ds(4) should be less than or equal to 150 . (In case of existing HL2 material, the same value is almost double)	
	9	Water proofness i) Cone test ii) Hydrostatic head test	-	i) IS:7941 ii) IS:391	i) Water should not leak through cloth. ii) Resistance of water fabrics, water head in cm special proofed 23	Acceptable	
	10	Weight (min) (max)	g/m ²	ASTM D751	4300 2000	Acceptable weight shall be amended as Minimum 2500, to ensure thickness and life of product	
	11	pH value	-	IS: 1390 (cold method_	6.0-8.5	Acceptable	