

Sub: Reasoned document based on comments received from vendors on final draft Specification No. IRS- R-48-21, March - 2021 for Rubber components used in the air brake equipment of diesel and electric locomotives, electric multiple unit (emu) stock and diesel rail cars

Cl. No. of RDSO spec.	Description as per final draft Specification No. IRS- R-48-21, March - 2021	Firm's name and their comments					M&C Dte's comments	RDSO's remarks with revised Para of spec
		M/s A. K. Industries / Kolkata	M/s Basant Rubber Factory Pvt. Ltd. / Mumbai	M/s Faiveley Transport Rail Technologies India Limited / Hosur	M/s M.G.M. Rubber Company/ Kolkata	M/s Swan Rubber Industries / Kolkata		
0.8 (now 0.6)	Tests for compression set on „O” rings & development of reinforced piston packing for brake cylinders with adhesion values between the reinforced fabric & the rubber are currently under standardization and shall be included in the specification when finalised.	---	---	“Noted & Complied” against all the clauses of revised specification no. IRS-R-48-21	Nil	---	It is observed that values of Compression set is already mentioned in the table under Para 3.2.4.I at s. no.4. As for as Adhesion values between fabric and Rubber is concern, M&C directorate does not have any standardized values for above item and no any failure records available at our end.	In view of M & C Dte's comment, the para may be deleted.
1.1.1.	A minimum of six samples or 0.5 % of the lot offered for inspection whichever is higher shall be drawn for tests indicated in the relevant specification.	A maximum of six samples or 0.5/ of the lot offered for inspection whichever is lower, subject to minimum 6/8 samples shall be drawn for tests indicated in the mentioned specification /wherever practicable) <u>Justification for changes :</u> 1) As per clause, 4.3.4.1 Swelling tests are conducted form two samples out of 6/8 samples drawn if practicable. Hence three types of swelling each from two samples will lead to six results. Average reading of two samples of each swelling to be taken. Thus we have to suggested two samples out of 6/8 samples. 2) Sometime the products are too small to conduct the specified testing. So the word"	---		A maximum of six samples or 0.5 % of the lot offered for inspection whichever is lower, subject to maximum 8 samples shall be drawn for tests indicated in the relevant specification wherever practicable. <u>Justification for changes :</u> 1) As per Cl.4.3.4.1, swelling tests are conducted from samples if practicable. Hence we will have to capture minimum 54 record (3 x 6 x 3) if we want to conduct 3 swelling test from all 6 different samples with minimum 3 readings for each. As such, it will be a humongous task if no upper ceiling of sample quantity is specified. We have thus suggested a maximum 8 samples for conducting all those tests.	---	It does not pertains to M&C directorate, Nodal directorate may decide.	M/s FTRTIL has mentioned that the all the clauses of revised specification are “Noted & Complied” and other firms i.e. M/s Basant Rubber & M/s Swan are also not commented on this clause. Hence, changes may not be required.

		Whenever practicable" should be mentioned			2) Sometime the product is too small to conduct a specific testing, hence the word "wherever practicable" is included			
1.3.1 The manufacturer shall prepare adequate number of test slabs or conducting tests at the manufacturer's premises during inspection by the inspecting authority, for the reference samples with inspecting authority and for the tests by the consignee.	<p>Manufacturer shall prepare two slabs and three numbers of buttons conducting tests at the manufactures' place during inspection by Inspection authority and also by the Consignee.</p> <p><u>Justification for changes :</u> 6/8 (Samples (dumble) shape from test slab to be drawn for physical testing (like T.S, E.B. etc) 3 samples for before ageing and 3 samples for after ageing. And average resulting of 3 to 4 samples to be taken for both. Swelling tests are conducted on the same test slab. Hence for 3 types of swelling, two samples pieces to be drawn for each swelling and average to be taken for each case.</p> <p>Hardness: This test is conducted on from one button (before and after ageing).</p>	---		<p>..... The manufacturer shall prepare 2 numbers of numbers of test slabs & 3 numbers of buttons for conducting tests at the manufacturer's premises during inspection by the inspecting authority, for the reference samples with inspecting authority and for the tests by the consignee.</p> <p><u>Justification for changes :</u> Number of test slabs and buttons should be quantified. Normally all such tests such as hardness, compression, swelling, ash content etc. can be easily carried out from 2 numbers of test slabs & 3 numbers of buttons. It is also our normal practice to use 2 test slabs and 3 buttons for the said purpose and hence we have suggested accordingly.</p>	---	It is very clear that the manufacturer shall prepare adequate no. of test slabs for conducting test, then quantifying the no. of slabs is not justified. In quantifying the no. of test slabs re-testing will not be possible if required. Nodal directorate may decide accordingly.	M/s FTRTIL has mentioned that the all the clauses of revised specification are "Noted & Complied" and other firms i.e. M/s Basant Rubber & M/s Swan are also not commented on this clause. The remarks/ suggestions were also sought from M & C Dte on firm's comment. The M & C Dte's comment received & same may be accepted. Hence, changes may not be required.
1.3.4	For the purpose of confirming /co-relating the composition of the tests slabs with that of the components, the following tests shall be performed both on tests slabs and the components and shall comply with the requirements is given as under:	<p>Compression: This test is also conducted on one button.</p> <p>Swelling on button: Three types of swelling to be performed on one button.</p> <p>Swelling Test on Test Slab: Three types of swelling to be conducted on same Test Slab. Two samples pieces to be drawn for each swelling and average to be taken for each cases.</p> <p>Ash Contest: On Test Slab Button & finish product <u>Quantification of number of corresponding sample is</u></p>	---		For confirming / co-relating the composition of the test slabs & buttons with that of the components, the following tests shall be performed on 2 numbers of tests slabs & 3 numbers of buttons as applicable and the components, and shall comply with the requirements is given as under: <u>Justification for changes :</u> Number of test slabs and buttons should be quantified. Normally all such tests such as hardness, compression, swelling, ash content etc. can be easily carried out from 2 numbers of test slabs & 3 numbers of buttons. It is also our normal	---	nil	Remarks as above (para 1.3.1)

		important aspect. However as per our normal practice we use:- <u>a) Test Slab</u> — Two numbers <u>b) Button</u> — Three numbers <u>c) Component product: Two numbers</u> out of the components drawn from finish product.			practice to use 2 test slabs and 3 buttons for the said purpose and hence we have suggested accordingly.			
1.3.4 (a)	Identification of polymer: Observation shall be identical	Should be deleted for colour spot test but identification of Polymer could be judged for one burning test only. <u>Justification for changes :</u> Polymer identification chart is given.	---		Should be deleted if Annexure-A is unacceptable. <u>Justification for changes :</u> Since colour spot test is not confirmatory test for vulcanized rubber compound, hence there is no proven method to quickly identify the polymer from vulcanized rubber compound. Quite long back we have highlighted this matter to ASTM and the correspondence is attached herewith. Now-a-days due to presence of various advanced chemicals used to manufacture the product it becomes almost impossible to detect base polymer by means of chemical testing. Hence we are suggesting an alternative direct test method by which we may identify the base polymer easily. The method is enclosed in Annexure-A	---	Now a days FTIR (Fourier Transform Infrared Spectroscopy) is best suited technique for Polymer Identification.	The comments of M&C may be accepted. Accordingly, para may be revised as under: Identification of polymer : Observation shall be identical (By Fourier Transform Infrared Spectroscopy technique (date of enforcement may be given 01.10.2021)
3.2.4.1 Gr. D	Elongation at break (%), min = 300 %	Elongation at break (%) min should be 200%. <u>Justification for changes :</u> This is happened probably typographical mistake	---		Elongation at break (%), min. should be 200%. <u>Justification for changes :</u> Correction of probable typographical mistake	---	Elongation at break % (min) is to be corrected as 200 in place of 300, this may be the typographical error.	It is typographical error. Hence, the value has been corrected