

## Reasoned Documents on Draft Specification IRS:S 88/2004 Version 1.0 for Low Maintenance Lead Acid Secondary Cells.

Existing Cl. of IRS : S:88 /04 Ver.1	Description of IRS:S:88/04 Ver.1		Remarks of Minutes of meetings	Final Draft IRS:S:88 Version 2.0-d1		RDSO's Remarks
0.2	This specification require reference to the following Indian Standards (IS), and Indian Railway Standards(IRS).			This specification require reference to the following Indian Standards (IS), <b>and</b> Indian Railway Standards (IRS) <b>and RDSO specification.</b>		
				<b>IS/IRS/RDSO Spec.</b>	<b>Specification Description</b>	
	IS: 1651-1991	Specification for Stationary cells and batteries, Lead acid type (with tubular positive plates).	Reference spec shall be IS:1651:2013	IS: 1651- <del>1991</del> 2013	<del>Specification for</del> Stationary cells and batteries, Lead-acid type (with tubular positive plates).	Clause updated as per latest IS spec.
	IS: 1146-1984	Hard rubber and plastic containers for Lead-acid batteries.	--	IS: 1146- <del>1984</del> 1981	<del>Hard</del> Rubber and plastics containers for Lead-acid <b>storage</b> batteries.	Updated as per available IS spec. Description amended as per IS : 1146 1981.
	IRS: S 23	Electrical Signalling & Interlocking Equipment.	--	IRS: S 23	Electrical <b>and Electronic based</b> Signalling & Interlocking Equipment.	Description amended as per spec IRS: S 23.
	IS:1069-1993	Specification for Water for storage batteries.	--	IS:1069-1993	Quality tolerances <b>Specification</b> for Water for storage batteries.	Description amended as per spec. IS:1069-1993.
<b>New</b>			--	<b>IS:4905-<del>1968</del>2015</b>	<b>Random Sampling and Randomization Procedures.</b>	IS: 4905-2015 is referred in Annexure –A Cl. No. A. 1.2 of IRS: S:88 Ver 1.0 spec. But was not covered in referred Cl. 0.2 of the spec.
<b>New</b>			--	<b>IS: 8320-2000</b>	<b>General requirements and methods of tests for Lead-acid storage batteries</b>	New reference may be added in line with Cl. No. 11.4.1 of IS:1651: 2013
<b>New</b>			--	<b>RDSO Spec No. RDSO/PE /SPEC / AC /0058-2005 (Rev.-0)</b>	<b>LMLA batteries for 110V train-lighting and air conditioned SG coaches.</b>	PS & EMU Dte. Specification of RDSO may be added as some clauses incorporated in line with the spec.

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0.5	For the purpose of this specification, the terminology given in IRS: S 23 wherever applicable and IS: 1651-91 shall apply.	Reference specification shall be IS:1651:2013	For the purpose of this specification, the terminology given in IRS: S 23 wherever applicable and IS: 1651- <del>91</del> 2013 shall apply.	Updated as per latest IS spec.
2.2	The cell / Battery shall be designated as per clause 4.2 of IS: 1651-91 followed by LM for indicating low maintenance character of the batteries.	Reference specification shall be IS:1651:2013	The cell / Battery shall be designated as per clause 4.2 of IS: 1651- <del>91</del> 2013 followed by LM for indicating low maintenance character of the batteries.	Updated as per latest IS spec.
3.2	The positive plate shall be tubular. The negative plate shall be pasted type of lead alloy. The positive and negative plate shall have antimony content less than 3% with suitable ingredients in grid to minimise antimony transfer and water loss during charging.	The positive plate shall be tubular. The negative plate shall be pasted type of lead alloy. The positive plate shall have antimony content less than 3% & the negative plate shall have antimony content less than 2% to minimise water transfer and water loss during charging.	The positive plate shall be tubular. The negative plate shall be pasted type of lead alloy. The positive <del>and negative</del> plate shall have antimony content less than 3% & <del>the</del> negative plate shall have antimony content less than <del>3% 2% with suitable ingredients in grid</del> to minimise <del>antimony water</del> transfer and water loss during charging.	Incorporated as per minutes of meeting and previous final draft spec. To minimize water transfer and water loss during charging. Design is vendor specific.
3.2.1	Separator shall be micro porous rubber, PVC or any other material conforming to IS: 6071-1986. The volume porosity shall be not less than 35%.	Agreed (PE may be included) Rubber may be deleted.	Separator shall be micro porous rubber, <del>PE</del> , PVC or any other material conforming to IS: 6071-1986. The volume porosity shall be not less than 35%.	PE separator will improve the porosity. PE separator is being used for Train lighting/AC coach.

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3.3.1	The electrolyte height at the top of the separator shall be 40mm (minimum) to achieve low maintenance features for batteries above 120AH.	Already covered, No change	The electrolyte height at the top of the separator shall be 40mm (minimum) <b>in fully topped up condition</b> to achieve low maintenance features for batteries above 120AH.	May be modified. Already exists in previous final draft spec.
<b>3.3.2 (New Clause)</b>	--	--	<b>Electrolyte shall be prepared from battery grade sulphuric acid conforming to IS 266-1993 with latest amendment.</b>	New clause may be added in line with Power Supply and EMU Dte. Cl. No. 3.6 of RDSO Spec No. RDSO/PE/SPEC/AC/0058-2005 (Rev.-0). Standardization of preparation of electrolyte is ensured.
<b>3.4</b>	The dimensions of the 2V cell of various capacities shall be in accordance with table 1 of Clause 7.1 of IS: 1651 and that of monoblock cells shall be in accordance with the relevant IS specification.	--	The dimensions of the 2V cell of various capacities shall be in accordance with table 1 of Clause 7.1 of IS: 1651- <b>2013</b> and that of monoblock cells shall be in accordance with the relevant IS specification.	Updated as per latest IS spec.
<b>3.5.1</b>	Vent plugs shall be placed and secured in position to minimise loss of water/acid by carry over and evaporation. The vent plug shall be of ceramic or any other suitable fire retardant material. The vent plug shall allow free movement of gases evolved during service and shall not permit electrolyte to come out of the surface of lid. On Removal of vent plug for drawing of the electrolyte sample, servicing and checking of electrolyte shall be possible.	--	Vent plugs shall be placed and secured in position to minimise loss of water/acid by carry over and evaporation. The vent plug shall be of ceramic or any other suitable fire retardant material. The vent plug shall allow free movement of gases evolved during service and shall not permit electrolyte to come out of the surface of lid. <del>On</del> Removal of vent plug for drawing of the electrolyte sample, servicing and checking of electrolyte shall be possible.	Typographical error.

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3.6	<b>Sealing Compound</b> Sealing compound, if bitumen based, shall conform to IS: 3116-1965 with latest amendments.	--	<b>Sealing Condition</b> Sealing compound, if bitumen based, shall conform to IS: 3116-1965 with latest amendments. <b>For PPCP Container Battery: In PPCP container 100% leak proof nature of heat seal shall be provided.</b>	Sealing for PPCP container specified & incorporated.
3.10	<b>Nuts and Bolts</b> Bolts and nuts for connecting the cells, shall be made of copper / brass and shall be effectively lead coated to prevent corrosion.	Shall be of stainless/MS with lead coating. Copper/Brass may be deleted.	<b>Nuts and Bolts</b> Bolts and nuts for connecting the cells, shall be made of copper / brass and shall be effectively lead coated to prevent corrosion. <b>The lead coating shall be in accordance with BIS 6848 -1979 latest issue (lead coating shall not be less than 0.025mm).</b>	Not agree with the firm. Specification for lead coating along with thickness of lead coating specified.
<b>3.11 (New Clause)</b>			<b>General Requirements for PPCP Container Battery :</b>	Add for PPCP container
<b>3.11.1 (New Clause)</b>			<b>The container shall be Polypropylene co-polymer (PPCP) translucent containers and shall conform to these tests as per clause no. 7 of IS: 1146/1981.</b> 1. Verification of constructional requirements 2. Verification of marking 3. High Voltage test 4. Drop ball test 5. Izod impact test 6. Plastic yield test 7. Acid resistance test	Test added in line with Power Supply and EMU Dte. Cl. No. 3.4.1.4 – (4.0) of Spec No. RDSO/PE/SPEC /AC /0058-2005 (Rev.-0) and Cl 3.1.1 in previous final draft spec. now shifted at Cl. 3.11.1 .
<b>3.11.2 (New Clause)</b>	--	--	<b>Outer Wall Thickness of Container without ribs is 3.5 mm to 6.5 mm.</b> <b>The outer wall thickness shall be measured on all the sides of the container i.e. longer side, shorter side and base. However, the minimum wall thickness of container / lid shall not be less than 3.0 mm, if design of the container / lid with strengthening members / ribs which may be provided inside and / or outside of the container / lid.</b>	New clause added in line with Power Supply and EMU Dte. Cl. No. 3.4.1.4 of RDSO Spec No. RDSO/ PE/ SPEC/AC/ 0058-2005 (Rev.-0)

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3.11.3 (New Clause)	--	--	Partition wall thickness is 2.2 mm to 2.8 mm	-do-
3.11.4 (New Clause)	--	--	<b>Provision of Handle on Cells / Batteries</b> Moulded / rope handle shall be provided on the container of cells / batteries. The handle arrangement shall not be provided on the lid. Either moulded or rope handle is acceptable on container.	-do-
4.1	<p>Marking</p> <p>The following information shall be indelibly and durably marked on the outside of the cell.</p> <p>a) Manufacturer's type and trade name followed by LM indicating the low maintenance feature.</p> <p>b) AH capacity at 10 hours rate.</p> <p>c) Upper and lower electrolyte level in case of transparent container.</p> <p>d) Year of manufacture.</p>	<p>Accepted, may be modified as:-</p> <p>The following information shall be indelibly and durably marked / screen printed on outside of each battery/cell.</p> <p>a) Manufacturer's type and trade name followed by LM indicating the low maintenance feature.</p> <p>b) AH capacity of the battery at 10 hours rate.</p> <p>c) Months &amp; Year of manufacture.</p> <p>e) Serial no. of battery/cell.</p>	<p>Marking</p> <p>The following information shall be indelibly and durably marked / <b>screen printed</b> on <del>the</del> outside of <del>the</del> <b>each battery/cell</b>.</p> <p>a) Manufacturer's <b>type name</b> and trade name followed by LM indicating the low maintenance feature.</p> <p>b) AH capacity <b>of the battery</b> at 10 hours rate.</p> <p><del>c) Upper and lower electrolyte level in case of transparent container.</del></p> <p>d) <b>Months &amp; Year</b> of manufacture.</p> <p>e) <b>Serial no. of battery/cell.</b></p> <p><b>(Note: Sticker not permitted on cells)</b></p>	Incorporated as per minutes of meeting.
4.1.1	A yellow band of 25 mm width shall be provided on both sides along with the width of the cell for easy identification of Low maintenance batteries.	Agreed (May be deleted)	<del>A yellow band of 25 mm width shall be provided on both sides along with the width of the cell for easy identification of Low maintenance batteries.</del>	Clause 4.1.1 may be deleted as per minutes of meeting. Specification is only for LMLA cell only.

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5	INSTRUCTION & MAINTENANCE MANUAL	--	INSTRUCTION & MAINTENANCE MANUAL	Corrected, Typographical error in IRS:S:88/04 Ver.1
6.2	The battery /cell shall have capacity not less than the declared capacity at C10 rate to end voltage 1.85 Volts per cell.	Accepted, may be modified as:- Unless otherwise specified under various tests or in the individual specification, the temperature for tests shall be between 20°C and 30°C. The battery /cell shall have capacity not less than the rated capacity C10 rate to end voltage 1.85 Volts per cell.	Unless otherwise specified under various tests or in the individual specification, the temperature for tests shall be between 20°C and 35°C. The battery /cell shall have capacity not less than the declared rated capacity at C10 rate to end voltage 1.85 Volts per cell.	Incorporated as per minutes of meeting and previous final draft spec. Temp was kept between 20°C and 30°C as per old IS. In latest IS: 8320-2000 temp. is between 20°C and 35°C (IS: 8320-2000, Cl. No. 11.1)
6.3	The batteries shall be supplied dry and uncharged. The Ampere-hour efficiency measured as per Clause 12.9 of IS: 1651-91 shall not be less than 95% .	Agreed, May be corrected. Ampere Hour Efficiency as per Cl. 12.9 of IS 1651-2013 shall not be less than 92%.	The batteries shall be supplied dry and uncharged. The Ampere-hour efficiency measured as per Clause 12.9 of IS: 1651-91 shall not be less than 95% .	Incorporated as per minutes of meeting and previous final draft spec . Updated as per Cl. No. 12.9.1.1 of latest IS: 1651 2013 spec.
7.1.1.1 (New Clause)	--	--	Additional Tests Required for PPCP container shall be as per cl. No. 7.1.2 (b).	It may be kept in type test in line with Power Supply. In view of remarks given in cl. No. 3.11.1 above.
7.1.2	--	--	7.1.2 (a)	Re-numbered

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7.1.2 (b) (New Clause)	--	--	<b>Additional Tests Required for PPCP container</b> (i) Polypropylene co-polymer (PPCP) containers shall conform to the tests as per clause no. 3.11 of this specification. (iii) Test for Material And Component Verification shall be carried out as per clause no. 7.17 of this specification.	(i) As per above remarks given for S. No. 7.1.1.1 & (ii) It may be kept in type test in line with Power Supply and EMU Dte. Cl. No. 5.22 and 5.4.2 (o) of Spec No. RDSO /PE/ SPEC /AC /0058-2005 (Rev.-0).
7.1.3	The manufacturer shall submit two sets of drawing in A4 size listed below for approval while offering the cell for type testing.		The manufacturer shall submit two sets of drawings of components of battery in A4 size as per clause 9 of this specification <del>listed below for approval</del> while offering the cell for type testing.	May be modified.
7.1.4	Acceptance test The following shall constitute the acceptance tests: a) Verification of marking and packing Cl. 7.3 b) Verification of dimensions Cl. 7.4 c) Test for capacity Cl. 7.5 d) Air pressure test Cl. 7.15	--	Acceptance test The following shall constitute the acceptance tests: a) Verification of marking and packing Cl. 7.3 b) Verification of dimensions Cl. 7.4 c) Test for capacity Cl. 7.5 d) Air pressure test Cl. 7.15 e) Drop Ball test Cl. 7.16	Drop ball test may be kept in acceptance test for PPCP container in line with Cl. 5.5.5.1 (c) of Spec No. RDSO /PE/ SPEC /AC /0058-2005 (Rev.-0).
7.1.5 (New Clause)	--	--	<b>Routine test</b> The following shall constitute the routine tests: a) Verification of marking and packing Cl. 7.3 b) Verification of dimensions Cl. 7.4 c) Test for capacity Cl. 7.5 d) Air pressure test Cl. 7.15 e) Drop Ball test Cl. 7.16	Routine test as new clause may be added, in compliance to Vigilance Cell, RDSO's note no. 13/Vig/Policy dtd. 03.12.16.

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7.4	<b>Verification of dimensions:</b> The overall dimensions of cells of standard capacities shall conform to the requirements given in table 1 clause 7.1 of IS: 1651-91 for 2V cells.	--	<b>Verification of dimensions:</b> The overall dimensions of cells of standard capacities shall conform to the requirements given in table 1 clause 7.1 of IS: 1651-912013 for 2V cells.	Updated as per latest IS spec.
7.5	<b>Test for capacity:</b> This shall be carried out as per clause 12.5 of IS: 1651-91 on all the 7 samples.	--	<b>Test for capacity:</b> This shall be carried out as per clause 12.5 of IS: 1651-912013. on all the 7 six samples.	Updated as per latest IS spec. Mentioning No. of sample may create confusion as the same clause is referred for acceptance test (Cl. 7.1.4 (c) of spec.
7.6	<b>Tests for loss of capacity on storage:</b> The test shall be carried out as per clause 12.7 of IS: 1651-91. The loss of capacity thus measured shall not be more than 5%. It shall be done on 2 cells.	--	<b>Tests for loss of capacity on storage:</b> The test shall be carried out as per clause 12.7 of IS: 1651-912013. The loss of capacity thus measured shall not be more than 5%. It shall be done on 2 cells.	Updated as per latest IS spec.
7.7	<b>Endurance test:</b> The test shall be carried out as per clause 12.8 of IS: 1651-91 and shall meet the requirements brought out in clause 12.8.4 of IS: 1651. It shall be done on 2 cells.	--	<b>Endurance test:</b> The test shall be carried out as per clause 12.8 of IS: 1651-912013 and shall meet the requirements brought out in clause 12.8.4 of IS: 1651-2013. It shall be done on 2 cells.	Updated as per latest IS spec.
7.8	<b>Ampere hour and Watt hour efficiency test:</b> The test shall be carried out as per Clause 12.9 of IS: 1651-91 and the AH efficiency shall not be less than 95% and the watt hour efficiency shall not be less than 75%. It shall be done on 2 cells.	Agreed, May be corrected. Ampere Hour Efficiency as per cl. 12.9 of IS 1651-2013 shall not be less than 92%.	<b>Ampere hour and Watt hour efficiency test:</b> The test shall be carried out as per Clause 12.9 of IS: 1651-912013 and the AH efficiency shall not be less than 95% 92% and the watt hour efficiency shall not be less than 75%. It shall be done on 2 cells.	Remarks given at Cl. 6.3 above



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7.9	<p><b>Test for Voltage during discharge:</b></p> <p>The test shall be carried out as per clause 12.10 of IS: 1651-91 and samples shall meet the requirements brought out in clause 12.10.1 of IS: 1651-91. It shall be done on 2 cells.</p>	--	<p><b>Test for Voltage during discharge:</b></p> <p>The test shall be carried out as per clause 12.10 of IS: 1651-912013 and samples shall meet the requirements brought out in clause 12.10.1 of IS: 1651-912013. It shall be done on 2 cells.</p>	Updated as per latest IS spec.
7.10.3	<p>Every 50<sup>th</sup> discharge after initial 350 cycles shall consist of a discharge at the 10 hour rate in accordance with provisions of IS: 1651-91. Prior to each tests discharge, an equalizing charge shall be given and the specific gravity of the electrolyte of all the cells adjusted in accordance with the specified value. The discharge shall be followed by a recharge at the normal charging rate specified by the manufacturer.</p>	--	<p>Every 50<sup>th</sup> discharge after initial 350 cycles shall consist of a discharge at the 10 hour rate in accordance with provisions of IS: 1651-912013. Prior to each tests discharge, an equalizing charge shall be given and the specific gravity of the electrolyte of all the cells adjusted in accordance with the specified value. The discharge shall be followed by a recharge at the normal charging rate specified by the manufacturer.</p>	Updated as per latest IS spec.
7.11.2	<p>The capacity after 24 months, when tested as above shall be not less than <math>\pm</math> 3% of the obtained capacity.</p>	--	<p>The capacity after 24 months, when tested as above shall be not less than <math>\pm</math> 3% of the obtained rated capacity.</p>	Already incorporated in previous draft spec. Battery under this test has not undergone capacity test. Hence cannot be compared with obtained capacity.

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7.12	<p><b>Loss of Water Test</b> After fully charging the cell, it should be cleaned and dried. It should be weighed immediately but not exceeding one hour after drying with an accuracy of 0.05% or maximum least count of 50 gm for the balance used. Then all vent cum-filling plugs should be closed tightly and connected to constant voltage charger keeping the voltage <math>2.4 \pm 0.05V</math> per cell for 21 days in water bath at the temperature of <math>50 \pm 2</math> deg. C. Thereafter cell is removed from circuit and dried. After this it is weighed accurately. The water loss shall not exceed 0.7-gm/Ah/ cell of the rated capacity.</p>	Agreed as: The water loss shall not exceed 0.7-gm/Ah/ cell of the obtained capacity as achieved during the capacity test as per Cl. No. 7.5 of the spec.	<p><b>Loss of Water Test</b> After fully charging the cell, it should be cleaned and dried. It should be weighed immediately but not exceeding one hour after drying with an accuracy of 0.05% or maximum least count of 50 gm for the balance used. Then all vent cum-filling plugs should be closed tightly and connected to constant voltage charger keeping the voltage <math>2.4 \pm 0.05V</math> per cell for 21 days in water bath at the temperature of <math>50 \pm 2</math> deg. C. Thereafter cell is removed from circuit and dried. After this it is weighed accurately.</p> <p>The water loss shall not exceed 0.7-gm/Ah/ cell of the <b>rated obtained</b> capacity <b>as achieved during the capacity test as per Cl. No. 7.5 of the spec.</b></p>	Incorporated as per minutes of meeting. Also, modified in line with Cl. No. 12.11 of IS 1651: 2013.
7.15	<p><b>Air pressure test:</b></p> <p>a) Air pressure test shall be conducted on at least two samples. Sealing of each cell of the battery shall be checked by compressed air at pressure equal to 700-mm height of water column.</p> <p>b) Requirement – The air pressure shall not fall below 670 mm of water column in 15 seconds after the air supplied to the cell is disconnected.</p>	Agreed  May be incorporated in line with spec. of other directorate of RDSO for the similar item.	<p>a) Air pressure test shall be conducted on at least two samples. Sealing of each cell of the battery shall be checked by compressed air at pressure equal to 700-mm height of water column.</p> <p>b) Requirement – The air pressure shall not fall below 670 mm of water column in 15 seconds after the air supplied to the cell is disconnected.</p> <p><b>c) Air Pressure test for PPCP container battery:</b> <b>To check the leakage and sealing strength in PPCP cell / batteries compressed air at the pressure of 5 psi shall be applied for 1 minutes during type testing. The cell lid shall not show any visible sign of movement due to the air pressure and drop in pressure due to leakage.</b></p> <p><b>Note: This test shall be carried out on unfilled cells. This leak test shall be done on 100% cell / mono blocks of PPCP at the pressure of 4-5 psi for 15 seconds as routine test by manufacturers.</b></p>	Incorporated as per minutes of meeting and in line with Cl. No. 5.15 of RDSO Spec No. RDSO /PE/ SPEC /AC/0058-2005 (Rev.-0)

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7.16 (New Clause)			<p><b>Drop Ball Test for PPCP container battery:</b></p> <p>(a) For the drop ball test the minimum height from which the ball, with procedure as defined in IS: 1146-1981, when dropped which causes the fracture, shall not be less than 400 mm (min. one time drop) for each side before and after High voltage test. The design will provide for adequate safety margins for achieving the required strength so that containers do not bulge / crack during service.</p> <p>(b) Checking of container strength on assembled battery shall be done by dropping a ball as per clause 7.6 IS: 1146-1981. The container should pass as defined in para 7.16 (a) above. This test shall be conducted on two nos. of assembled batteries for each lot.</p>	Drop ball test may be kept in acceptance test for PPCP container in line with Cl. 5.5.5.1 (c) of Spec No. RDSO /PE/ SPEC /AC /0058-2005 (Rev.-0) except sampling. In Electrical Dte. Spec. It is 05 samples. Here, 02 samples have been specified in consonance of sampling plan (Min-02 samples – Annexure-A)
7.17 (New Clause)	--	--	<p><b>Material And Component Verification Test for PPCP container battery:-</b></p> <p>The cell/battery shall be examined in the dismantled condition to see that the manufacturing is as per approved outline and assembly drawing and the various components are conforming to the specification as detailed in the specification.</p>	New clause added in line with Cl. No. 5.22 of RDSO Spec No. RDSO/ PE / SPEC /AC /0058-2005 (Rev.-0).

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8	<p><b>MAINTENANCE TOOLS AND INSTRUCTIONS</b></p> <p>A wall mounting type "Tool Board" of suitable material and protected against acid fumes shall be supplied along with set of 12 nos. each battery. The tool board shall comprises:</p>	No change	<p><b>MAINTENANCE TOOLS AND INSTRUCTIONS</b></p> <p>A wall mounting type "Tool Board" of suitable material and protected against acid fumes shall be supplied <del>along with set of 12 nos. each battery</del> as per requirement of the Railways. Railway to specify the quantity. The tool board shall comprises:</p>	Already incorporated in previous draft spec. & also modified.
	iii) One cell- testing-voltmeter, 0-3 V of accuracy, class 0.5 in accordance with IS: 1248-1968. The resistance of the Voltmeter shall be 1000 ohms/Volt.	--	iii) <del>One cell- testing-voltmeter, 0-3 V of accuracy, class 0.5 in accordance with IS: 1248-1968. The resistance of the Voltmeter shall be 1000 ohms/Volt</del> <b>Digital Multimeter (3½ digit);</b>	Replaced by Digital Multimeter as it has better accuracy than analog meter.
9.1	C) Part drawings with sectional details of-	--	<p><b>- Container</b></p> <ul style="list-style-type: none"> <li>- Terminal post (Positive and Negative)</li> <li>- Container lid</li> <li>- Pole (Positive and Negative)</li> <li>- Plates (Positive and Negative groups assembly)</li> <li>- Separator</li> <li>- Sealed float guide</li> <li>- Micro porous vent plug</li> <li>- Inter cell /unit and end cell connectors</li> </ul>	Container may be added.
10	<p><b>INFORMATION TO BE SUPPLIED BY THE PURCHASER</b></p> <ul style="list-style-type: none"> <li>i) Nominal voltage of the cell / battery (Cl. 3.1)</li> <li>ii) Capacity (in AH at the 10 hr. rate)</li> <li>iii) Transparent container (Polypropylene)/Hard rubber container.</li> <li>iv) Accessories and spares required if any.</li> </ul>	--	<p><b>INFORMATION TO BE SUPPLIED BY THE PURCHASER</b></p> <ul style="list-style-type: none"> <li>i) Nominal voltage of the cell / battery (Cl. 3.1)</li> <li>ii) Capacity (in AH at the 10 hr. rate)</li> <li>iii) <del>Transparent</del> <b>Translucent PPCP</b> (Polypropylene <del>co-polymer</del>) container /Hard rubber container.</li> <li>iv) <del>Accessories and spares, required if any</del> <b>required if any</b>.</li> <li>v) <b>Total number of Tool kits sets requirement may be indicated by the purchaser.</b></li> </ul>	Already incorporated in previous draft spec. and also modified.

Existing Cl. of IRS:S:88/04 Ver.1	Description of IRS:S:88/04 Ver.1	Remarks of Minutes of meetings	Final Draft IRS:S:88 Version 2.0-d1	RDSO's Remarks
11.0 (New Clause)	--	--	All the provisions contained in RDSO's ISO procedures laid down in Document No. QO-D-7.1-11 dated 19.07.2016 (titled "Vendor-Changes in approved status") and subsequent versions/amendments thereof, shall be binding and applicable on the successful vendor/vendors in the contracts floated by Railways to maintain quality of products supplied to Railways.	New clause added, in compliance to Vigilance Cell, RDSO's note no. 13/Vig/Policy dtd. 26.07.16.
Annexure A A.1.1	In the consignment, all the cells of the same rating manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.	--	<del>In the consignment, all the cells of the same rating manufactured from the same material under similar conditions of production shall be grouped together to constitute a lot.</del> All the batteries of the same type, design and rating manufactured from the same material by the same factory under similar conditions of production shall constitute a lot as specified in Cl. G-1.1, Appendix- G of IS: 6848-1979.	May be modified as specified in Cl. G-1.1, Appendix- G of IS: 6848-1979.
Annexure A.1.2	These cells in the sample shall be drawn from the lot a random. For the purpose of random selection, reference may be made to IS: 4905-1968.	--	These cells in the sample shall be drawn from the lot a random. For the purpose of random selection, reference may be made to IS: 4905-1968 2015.	Year of IS : 4905 incorporated.
A2.1	The acceptance tests shall be conducted on minimum two samples up to a maximum of 1% of each type in a lot. the samples being drawn at random by the purchasing or inspecting authority as specified in Cl. 5.1.3.1. Appendix 'G' in Amendment No. 1 of IS 6848-79 latest.		The acceptance tests shall be conducted on minimum two samples up to a maximum of 1% of each type in a lot. <del>the samples being drawn at random by the purchasing or inspecting authority as specified in Cl. 5.1.3.1. Appendix 'G' in Amendment No. 1 of IS 6848-79 latest.</del>	May be modified. Random selection for drawing the samples is already covered in above A.1.