REVISION OF SPECIFICATION / STR

Ref: Current Spec. No. C-K409 (Rev-2) Amendment-4, STR for high capacity thermoplastic polyester elastomer (HYTREL) upper & lower washers used in the primary suspension for B.G. mainline coaches.

1. RDSO is reviewing the specification/STR to cater to the latest technological developments in the field, modify clauses not relevant in the present context and making them more enabling with focus on functional requirements.

2. It is requested that your comments / suggestions with regard to improvements / modifications in specification / STR of this item may be submitted in the following format alongwith the justification for the changes required.

Part A: Basic Information

SN	Particulars	Information
1	Name	
2	Designation	
3	Professional Qualification	
4	Organization / Firm's Name	
5	Address for Correspondence	
6	Contact No.	
7	Email ID	
8	In case of Firm / Individual: Manufacturing experience of item (or similar Item) on which comments are offered	
9	Where relevant: Whether any technical document to support suggested changes is available / enclosed for better appreciation	

Part B: Comments / suggestions on the specification

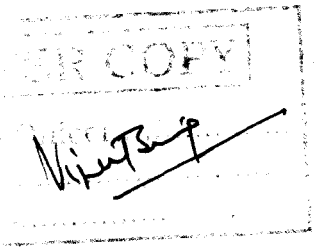
SN	Clause No. of RDSO STR / Spec	Clause, as exists in RDSO STR / Spec	Clause , as it should read after incorporation of comments / suggestions in the RDSO Spec / STR	Justification for changes

Comments may be sent to:

Director/SS/Carriage
Research Designs and Standards Organization
Manak Nagar, Lucknow – 226011

Email: edcar.rdso@gmail.com Or dirssrdso@gmail.com

INDIAN RAILWAYS



SCHEDULE OF TECHNICAL REQUIREMENTS FOR HIGH CAPACITY THERMOPLASTIC POLYESTER ELASTOMER (HYTREL) UPPER & LOWER WASHERS USED IN THE PRIMARY SUSPENSION FOR B.G. MAINLINE COACHES

S. No.	Month/Year of Issue	Revision/ Amendment	Page No.	Reason for Amendment
1.	December, 2004	-	-	First issue
2.	November, 2006	Revision-1	All pages	
3.	December, 2008	Revision-2	All pages	Improvement in parameters and quality
4.	February, 2009	Amendment-1	6 & 7	Crush load clause modified
5.	December, 2009	Amendment-2	6 & 12	Weight of washer as per drawing and Rockwell hardness tester added
6.	September-2010	Amendment-3	10	Service limit for thickness of washer (32 mm) defined
7.	August, 2016	Amendment-4	3	ISO Document No: QO-D-7.1-11 has been added as new sub Clause 1.2 in Scope of section- A

Issued By

Research Designs and Standards Organization
Manak Nagar, Lucknow-226 011

Signature		26/8/16	26/8/16
Name & Designation	Prepared By:- M.K. Arun SSE/SS/Carriage	Checked By:- Praveen Kumar Dy. Director/SS/Carriage	Approved By- Vineet Singhal Director/SS/Carriage

Amendments slip No. 4 of August, 2016 to Spec No. C-K409 (Rev.-2) for Schedule of Technical requirements for High Capacity Thermoplastic Polyester Elastomer (Hytrel) Upper & Lower Washers used in the primary suspension for B.G. mainline coaches

Add new sub **Clause 1.2** in **Scope** of section- A, as under:

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 contract floated by Railways to maintain quality of products supplied to Railways.

Amendment slip No. 3 of September 2010 to STR No. C- K409 (Rev.2) for High "Capacity Thermoplastic Polyster Elastomer (Hytrel)" Upper & Lower Washers used in the Primary Suspension for B.G. Mainline Coaches.

Read Clause 11 of Section-A as under:

11. WARRANTY

The store supplied against an order shall be deemed to bear a warranty of the manufacturer against defective materials/workmanship and performance for a minimum period of 30 months from the date of supply or 24 months from the date of fitment, whichever is earlier. In case, washer cracks, bulges, deforms or height becomes less than 32mm due to permanent set within the warranty period, it shall be replaced by new one without any cost within one month from the date of information received.

AMENDMENT NO.2 OF DECEMBER 2009 to STR NO. C-K409 (REV.2) FOR HIGH CAPACITY THERMOPLASTIC POLYESTER ELASTOMER (HYTREL) UPPER AND LOWER WASHERS USED IN PRIMARY SUSPENSION FOR BG MAINLINE COACHES

1. Read Clause-4.4.1 1 (c) of Section-A as under;

   The weight washer shall be as per RDSO Drg. No. CG-K4059.

2. Add new sub clause-4.1.8 of Section-B as under;

   4.1.8. Rockwell Hardness Tester

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AMENDMENT SLIP NO. 1 OF FEBRUARY 2009 TO STR NO.C-K409(REV.2) FOR HIGH CAPACITY THERMOPLASTIC POLYESTER ELASTOMER (HYTREL) UPPER AND LOWER WASHERS USED IN PRIMARY SUSPENSION FOR BG MAIN LINE COACHES

1. Read Clause 4.4.1.1(b) of Section-A as under:

(b) Crush Load Test:

After the successful testing of washers as per clause 4.4.1.1(a), the same washer shall be subjected to crush load test. The load of 15 tonne, at a speed of 10 ± 5 mm/minute shall be applied for 5 sec. The load shall be released immediately after 5 sec. The thickness of washer measured after two hours of the test shall not be less than 34 mm. The washers should also not show any crack or warpage.

2. Read Clause 4.4.1.2(b) of Section-A as under:

(b) Crush Load Test:

After the successful testing of washers as per clause 4.4.1.2(a), the same washer shall be subjected to crush load test. The load of 15 tonne, at a speed of 10 ± 5 mm/minute shall be applied for 5 sec. The load shall be released immediately after 5 sec. The thickness of washer measured after two hours of the test shall not be less than 34 mm. The washers should also not show any crack or warpage.

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SCHEDULE OF TECHNICAL REQUIREMENTS FOR HIGH CAPACITY THERMOPLASTIC POLYESTER ELASTOMER (HYTREL) UPPER & LOWER WASHERS USED IN THE PRIMARY SUSPENSION FOR B.G. MAINLINE COACHES

0. FOREWORD

0.1 This schedule consists of two parts viz. Section-A and Section-B. Section-A covers the technical requirements/provisions relating to material, manufacture and tests and does not include the necessary provisions of the contracts. Section-B covers the infrastructural, testing and quality control facilities required for manufacture of Hytrel Washers.

0.2 These Hytrel Washers are used in the primary suspension of ICF type bogies of BG Mainline coaches. These washers are used for better shock and noise absorption.

0.3 This schedule draws reference to some of the relevant IS, ASTM, ISO & BS specifications. Latest version of these specifications shall be taken as reference unless mentioned otherwise.

0.4 For the purpose of deciding whether a particular requirement of the schedule is complied with, the final value observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS: 2 -1960. The number of significant places retained in the rounded off value shall be the same as that of the specified values in this schedule.

0.5 While preparing this specification, due consideration has been given to the latest developments in the field of polymeric materials and process technologies, service requirements of the Indian Railways and practices followed in advanced countries.

SECTION - A

1. SCOPE

1.1. This section covers the technical requirements, sampling and method of tests for injection moulded "Thermoplastic Polyester Elastomer" Washers used in the primary suspension for axle box guide arrangement of ICF/RCF/BEML BG Mainline coaches.

2. TYPE

2.1 The Washers for axle box guide arrangement shall dimensionally conform to the RDSO drawings with latest alterations as mentioned below,

i) Upper Washer for Mainline coaches to Drg. No. CG-K4058
ii) Lower Washer for Mainline coaches to Drg. No. CG-K4059

3. REQUIREMENTS

3.1 Material

3.1.1 The material used for the manufacture of washers shall be "Hytrel' made by M/s E.I. DuPont or any other alternate equivalent "Thermoplastic Polyester Elastomer" material confirming to the properties specified in this schedule. Use of regenerated/reconstituted material is not permitted.

3.1.2 The manufacturer shall have a valid tie-up in the form of a written Memorandum of Understanding (MOU)/contract with M/s E.I. DuPont for "Hytrel" or with primary manufacturer of any other equivalent "Thermoplastic Polyester Elastomer" material, covering raw material supplies and technical support including quality control.

3.1.3 The manufacturer of the washers shall not change the constituents of the copolymer and shall only mould the washers out of the material supplied to them by the primary manufacturer.

3.1.4 The washers shall be supplied in natural colour of "Thermoplastic Polyester Elastomer" washer.

3.1.5 In case alternative equivalent material other than 'Hytrel' is offered for manufacture of washers, the washers made from alternate material will be subjected to field trials on at least 100 coaches for 18 months. Approval will be given only after satisfactory performance of washers in the field trials and capacity assessment of the firm.

3.1.6 Manufacturers shall maintain the records of raw material received from primary manufacturer and records & references of supplies made to Indian Railways. Records of raw material should be furnished by the manufacturer to the inspection agency at the time of inspection.

3.2 Construction, Workmanship and Finish

3.2.1 The Washers shall be manufactured using a Microprocessor Controlled, fully automatic screw type Injection Moulding Machine having a minimum locking tonnage of 400 tonne. In case of power interruption or disruption of any other kind (like machine stoppage), the manufacturer should discard 10 washers on restoring of machine, in order to maintain uniformity to avoid any inclusion.

3.2.2 The surface of the upper and lower washers shall be smooth and free from moulding defects such as bubbles, surface streaks, splash marks, voids, surface sinking, crazing and blistering of the surface, cracks etc. All edges shall be neatly finished and free from flash.

3.2.3 Manufacturers shall test each washer at a load of 10t for detection of cracks before offering the lot of washers for purchase inspection. Manufacturer will keep record of testing and will show to inspector during inspection or whenever asked for. This test is different from the test given in para-4.4.1.

3.3 Dimensions and Tolerances

The upper and lower washers shall be manufactured as per drawings mentioned under clause – 2.1. The dimensions and tolerances of the washers shall be as indicated in the respective drawings.

4. PROPERTIES

4.1 Unless otherwise specified, all tests shall be carried out at a temperature of 27 ± 2^0C and relative humidity 65 ± 5%.

4.2 Tests shall be carried out on "Dry As Moulded (DAM) Specimen", defined as those, which upon immediate removal from the mould, are sealed in containers impermeable to water vapour/ moisture.

4.3 The raw material used for the manufacture of washers shall conform to the requirements as given in Table-1, and shall be measured on prepared test specimen.

4.4 The washers shall conform to the requirements as given in Table-2,

Table-1
(Properties to be measured on prepared test specimen for Type test)

S. No.	Property	Test Method	Unit	Value
1	Hardness	ASTM D-2240	Durometer D	63 ± 5
2	Tensile Stress at break, minimum	ASTM D-638	MPa	30
3	Tensile Strain at break, minimum	ASTM D-638	%	350
4	Melt Flow Rate (from granules) 2.16 kg. at 230^0C temp.	ASTM D 1238	Gm/10 min	9.0 ± 3.0
5	Compression set after 22 hrs. 9.3 MPa at 100^0C	ASTM D-395 Method-A	%	Less than 10

Table-2
(Properties to be measured on finished product for Acceptance Test)

S. No.	Property	Test Method	Unit	Value
1	Specific Gravity	ASTM D 792	-	1.22 ± 0.03
2	Melting Point	BS-2782 - Part 1 (method 123B)	^{o}C	213 ± 8
3	Ash Content	ASTM D 5630	%	Less than 1
4	Load Deflection	As per Clause – 4.4.1	-	As per Clause – 4.4.1
5	Crush load test	As per Clause – 4.4.1	-	As per Clause – 4.4.1
6	Weight	As per Clause – 4.4.1	-	As per Clause – 4.4.1
7	Hardness	ASTM D-2240	Durometer D	63 ± 5

4.4.1 Compressive load deflection, crush load and weight:

4.4.1.1 Lower Washer for Mainline coaches

a) Compressive Load Deflection Test:

The test shall be carried out at room temperature (27 ± 2^0C) with machine speed of 10 ± 5 mm/minute. Two washers shall be subjected, in a suitable fixture, to 3 successive loading of 10t and in the fourth cycle, the deflection at the loads of 2t to 10t at the interval of one tonne shall be recorded with the help of dial gauge/digital read out. At the beginning of the fourth cycle, the dial gauge should be set at zero at a load of 100 Kg. The deflection of lower washers at different loads shall be within the specified limits as given below.

Load in tonne	Deflection in mm
2	4.25 – 5.75
3	5.95 – 8.05
4	7.65 – 10.35
5	9.05 – 12.05
6	11.35 – 14.50
7	12.50 – 15.10
8	14.00 – 16.60
9	15.20 – 17.80
10	16.60 – 19.30

After the test, the washer should also comply the following;

i) At the maximum load, the sample shall not show any evidence of cracking.
ii) The outer diameter, inner diameter and the thickness of washer measured after one hour of the test shall be within the specified tolerances of the drawing.

b) Crush Load Test:

After the successful testing of washers as per clause-4.4.1.1.(a), the same washer shall be subjected to crush load test. The load of 15 tonne, at a speed of 10 ± 5 mm/minute shall be applied for 5 sec. The load shall be released immediately after 5 sec. The outer diameter, inner diameter & thickness of washer shall be checked after two hours from release of the load. The dimensions shall be within the tolerances specified in the drawing. The washers should also not show any crack or deformations.

c) Weight:

The weight of washer shall be 685gms ± 15gms

4.4.1.2 Upper Washer for Mainline Coaches

a) Compressive load deflection test:

The test shall be carried out at room temperature (27 ± 2^0C) with machine speed of 10 ± 5 mm/minute. Two washers shall be subjected, in a suitable fixture, to 3 successive loading of 10 tonne and in the fourth cycle, the deflection at the loads of 2t to 10t at the interval of one tonne shall be recorded with the help of dial gauge/digital read out. At the beginning of the fourth cycle, the dial gauge should be set at zero at a load of 100 Kg. The deflection of upper washers shall be within the specified limits as given below.

Load in tonne	Deflection in mm
2	5.10 – 6.90
3	7.65 – 10.35
4	9.35 – 12.65
5	11.15 – 14.95
6	13.95 – 17.80
7	16.10 – 19.50
8	17.80 – 21.40
9	19.30 – 22.80
10	20.30 – 23.90

After the test, the washer should also comply the following;

i) At the maximum load, the sample shall not show any evidence of cracking.
ii) The outer diameter, inner diameter and the thickness of washer measured after one hour of the test shall be within the specified tolerances of the drawing.

b) Crush Load test:

After the successful testing of washers as per clause-4.4.1.2 (a), the same washer shall be subjected to crush load test. The load of 15 tonne, at a speed of 10 ± 5 mm/minute shall be applied for 5 sec. The load shall be released immediately after 5 sec. The outer diameter, inner diameter & thickness of washer shall be checked after two hours from release of the load. The dimensions shall be within the tolerances specified in the drawing. The washers should also not shown any crack or deformations.

c) Weight:

The weight of washer shall be 570gms ± 12gms

5.0 Tests

5.1 The tests for all the requirements laid down in this schedule are mandatory for product approval.

5.2 The tests specified in Table-1 shall constitute type tests and shall be carried out on prepared test specimen at the time of approval/renewal of the firm and at an interval of one year.

5.3 The tests specified in Table-2 are acceptance test and shall be carried out on each lot/batch of washers.

5.4 RDSO may draw the sample for quality check at its discretion and firm shall arrange the testing of these samples in a reputed out side laboratory as decided between RDSO and manufacturer. The testing charges should be borne by the manufacturer.

6.0 SAMPLING CRITERIA FOR CONFORMITY

The sampling plan for acceptance tests for lower and upper washers shall be as under:

6.1 The inspection lot shall consists of 500 Nos. of washers or part thereof.

6.2 The numbers of lower/upper washers to be selected from the lot for Acceptance Test shall be as under:

a.	Visual Inspection	Minimum 10 samples shall be drawn at random from each lot
b.	Dimensional Check & product weight	
c.	Specific Gravity	5 samples shall be drawn at random from each lot. Out of these samples selected, two nos. shall be tested for item nos. c, d, e, f.
d.	Hardness	
e.	Ash Content	
f.	Melting Point	
g.	Compressive Load Deflection & Crush load	2 samples from a lot of 500 Nos. or part thereof

6.3 Each sample selected for “Acceptance Test” shall conform to the requirements as laid down in Table-2. Should any one of the test samples fail to meet the requirements of “Acceptance Test”, double the number of samples from the same lot shall be drawn for re-testing. Should any of these samples fail, the entire lot shall be rejected.

6.4 In case of non-compliance in regard to dimensional check, the manufacturer may be given one chance to segregate the lot for dimensional conformity.

6.5 In the event of rejection of the lot, all washers constituting the lot shall be made unusable in the presence of the Inspecting Authority.

6.6 During inspection, Purchasing/Inspecting Authority, at their discretion may conduct "Type Test" and the samples shall conform to the values specified in Table-1 of this schedule.

7.0 APPROVAL OF FIRMS

7.1 Washers shall be procured only from RDSO approved sources.

7.2 During bulk production, the supplier shall not alter the material or any process after having successfully undergone the approval process.

7.3 The firm shall have all the facilities mentioned in Section-B of this STR.

7.4 A request for the registration for the item shall be made in the prescribed form to RDSO**.** The request for registration shall be accompanied with in-house test results and a valid copy of MOU as given in Clause-3.1.2, of this schedule.

7.5 The firm will be assessed by RDSO for compliance of STR & QAP in accordance with extant procedure. All test mentioned in the specification will be conducted for product approval.

7.6 The upper and lower washers shall be used in the pairs only and not individually or in combination with any other type of washer. Firm shall secure approval for both Upper as well as Lower washers, before getting final approval.

8.0 MARKING

8.1 Each Washer shall be suitably marked on the upper face with the following legend as per location indicated in the drawing,

i. Manufacturer's name/initial/trade mark
ii. Month and year of manufacture
iii. Lot/Batch Number

The markings should be clearly visible and readable.

9.0 PACKING

9.1 The Washers shall be securely packed individually in plastic bags indicating by a sticker the above-mentioned markings on each bag. 48 nos. of such bags shall be packed in a wooden/cardboard carton strong enough to resist damage in transit/storage.

10.0 STORAGE

10.1 Washers shall be stored in a cool and dry place, free from constraints, in the original packing.

10.2 Washers shall be kept covered and free from exposure to bright light, particularly sunlight.

10.3 Washers shall be stocked and arranged in such order as to ensure use of old stock first.

11. WARRANTY

The store supplied against an order shall be deemed to bear a warranty of the manufacturer against defective materials/workmanship and performance for a minimum period of 30 months from the date of supply or 24 months from the date of fitment, whichever is earlier. In case, washer cracks, bulges, deforms or permanently set within the warranty period, it shall be replaced by new one without any cost within one month from the date of information received.

SECTION - B

INFRASTRUCTURE & TESTING FACILITIES REQUIRED FOR MANUFACTURE OF HIGH CAPACITY THERMOPLASTIC POLYESTER ELASTOMER (HYTREL) UPPER & LOWER WASHERS USED IN THE PRIMARY SUSPENSION OF B.G. MAINLINE COACHES

1. SCOPE

1.1. This Section covers the infrastructure and quality control requirements for manufacture of high capacity upper and lower washers for ICF/RCF/BEML BG Mainline Coaches.

2.0. REQUIREMENTS

2.1 All vendors seeking registration with RDSO must fulfill the requirements of this schedule.

3.0. PLANT, MACHINERY & INFRASTRUCTURE REQUIREMENTS

3.1 The manufacturer shall have adequate space and covered area with cemented floor to accommodate the following & for smooth logistics:

a) Damp-free place for storage of raw materials
b) Adequate manufacturing area
c) Finishing, Assembly and Inspection area
d) Storing and dispatch of finished products

3.2 The manufacturer shall have at least one Microprocessor Controlled Injection Moulding Machines of minimum locking tonnage of 400 tonnes. Each machine shall be equipped with the following ancillaries:

a. Programme Logic Controlled (PLC) Electrostatic Oil Cleaning Machine
b. 6 stage oil-filtering machine
c. Programme Logic Controlled (PLC) Hopper Loader
d. Programme Logic Controlled (PLC) Mould Temperature Controller (MTC)
e. Programme Logic Controlled (PLC) Hopper Dryer of type Desiccant or Dehumidifier attached with Dew Point Meter.

3.3 The firm shall have the following equipments:

1. One set of moulds for each type of washers.
2. Hot air oven for annealing the finished product.
3. Cooling Water tank.
4. Cooling Tower.

3.4 The manufacturer shall have an Air Compressor of suitable capacity.

3.5 The manufacturer shall have suitable tools, cutters, polishing files, and Buffing Machine for de-flashing of moulded products.

3.6 The Manufacturer shall have a system to ensure that moulds are checked at regular intervals and adequate mould handling facilities like Chain Pulleys or Electric Hoists or other suitable equipment for moving heavy moulds.

3.7 Prior to release of dies/moulds for production, these are to be checked dimensionally and records containing details of such inspection and date, maintained.

3.8 Two Electronic Weighing Machines of reputed make, one of minimum 1 kg. capacity and the other of 50 kg. capacity with an accuracy of minimum 1gm and 100gm respectively, shall be provided.

3.9 Weighing machines shall be calibrated regularly by Govt. approved agency. The frequency of calibration shall be as per guidelines issued by Govt. or as recommended by the manufacturer of weighing machine**.**

3.10 In-house availability of minimum infrastructure for maintenance and polishing of dies and moulds shall be ensured.

3.11 The firm should have the facilities for minor repairs of day to day break down of machines.

3.12 The manufacturer shall have in-house computer based designing facility.

4.0 TESTING FACILITIES

4.1 The manufacturer shall have the following testing and other equipment installed in a laboratory set up with controlled temperature and humidity.

1. Tensile/Universal Testing Machine
2. Melt Flow Index Tester
3. Shore Hardness Tester for Durometer “D” scale
4. Apparatus to measure the Melting Point.
5. Weighing Balance with specific gravity determination kit.
6. Muffle Furnace of suitable capacity for determination of ash content.
7. Equipment to test Compression set as per ASTM D-395, Method A.

4.2 The manufacturer shall have Load compression testing facility with a minimum capacity of 20 tonnes to test the load deflection characteristics in accordance with clause 4.4.1 of Section-A.

4.3 The manufacturer shall have dies/moulds for preparation of various test specimens for the relevant tests.

4.4 All gauges required to ensure that the dimensions of Upper & Lower Washer are as per drawings shall be available.

4.5 The manufacturer shall have Jigs & fixtures for conducting test for load deflection, compression set etc. shall be available.

4.6 The manufacturer shall have arrangements like vice, cutter, polishing files etc. for preparation of various samples for tests such as tensile strength, hardness, specific gravity etc.

5.0 QUALITY CONTROL REQUIREMENTS

5.1 The firm should have acquired ISO: 9001-2000 certificate accredited by NABCB and the product for which the approval is sought should be broadly covered in the scope of the certification for manufacture and supply

5.2 The Quality manual of the firm for ISO: 9001- 2000 should clearly indicate at any stage the control over manufacturing and testing of the said railway product.

5.3 There should be a system to ensure the traceability of the product from raw material stage to finished product stage. The system should also facilitate to identify the raw material composition from the finish product stage.

5.4 It should be ensured that there is a Quality Assurance Plan for the product detailing the following various aspects:

- Organisation chart
- Process flow chart
- Stage inspection details from raw materials stage to finish product stage
- Various parameters to be checked and level of acceptance of such parameters indicated and method to ensure control over them.
- Disposal system of rejected raw material and components.

5.5 There should be at least one full time technologist having a minimum bachelor's degree in relevant field with experience of at least 5 years or a person with diploma in relevant field with 12 years experience. He should be free from day-to-day production, testing and quality control responsibilities. He should be mainly responsible for development of a product, analysis of products, control over raw material, and corrective action in case of difficulties in achieving the parameters.

5.6 Ensure that the in-charge of the Quality Control Section is having a qualification of minimum bachelor's degree in the relevant field and has a minimum of 5 years experience. Alternatively he should be a diploma holder with minimum of 12 years experience. He should be actively involved in day-to-day activities of quality control / stage inspection / compliance of QAP etc.

5.7 The firm must ensure that proper analysis is being done on monthly basis to study the rejections at various internal stages and it is documented.

5.8 The firm should ensure that latest version all the relevant specifications, IS standards are available with the firm.

6.0 DOCUMENTATION

Firm shall maintain following documents/records:

6.1 A well documented Quality Plan.
6.2 Incoming raw material register with Test Certificates references of suppliers and internal test results.
6.3 Stage inspection results including finished products results.
6.4 Records of internal rejection and its analysis vis-a-vis action plan.
6.5 Records of final products inspection by external agencies (like RDSO), Non –Conformity Reports and case analysis as well as action taken thereof.
6.6 Records for maintenance of dies/moulds.
6.7 Ensure that proper systems are available for dealing with customer complaint.

7.0 TRAINING

7.1 Training needs should be identified for all concerned officials and regular training shall be organised and imparted on maintenance of machines, quality assurance, safety parameters etc.

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