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For CONTROLLER
CQAE, AUNDH, PUNE - 27.

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GOVERNMENT OF INDIA
MINISTRY OF DEFENCE(DGQA)
DIRECTORATE GENERAL OF QUALITY ASSURANCE(DGQA)
SPECIFICATION NO.IND/ENG/PROV/1180/C

FOR

PATCHES FOR FLOATS

MAIN EQUIPMENT:BRIDGE ASSAULT,FLOATING HY CL 50 T(KM)

Supersedes Specification No.
IND/ENG/PROV/0708(C)

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ISSUED BY

CONTROLLERATE OF QUALITY ASSURANCE ENGINEERING EQUIPMENT.,
VISHWAKARMA VIHAR,AUNDH CAMP
PUNE - 411027

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GOVERNMENT OF INDIA

MINISTRY OF DEFENCE(DGQA)

DIRECTORATE GENERAL OF QUALITY ASSURANCE(DGQA)

CONTROLLERATE OF QUALITY ASSURANCE(ENGG EQPT)(CQAE)

DEFENCE SPECIFICATION

FOR

PATCHES FOR FLOATS

1.0 FOREWARD

1.1 This specification has been prepared by the ~~thx~~ Defence Engg Eqpt specification evaluation committee(DEESEC)on the authority of Controller ,Controllerate of Quality Assurance(Engg Eqpt) 411027. It supersedes all the specifications used here-to-fore for procureme of such items/equipment.

1.2 This specification has been prepared to lay down general requirements This would be used to guide manufacture Quality Assurance Inspection and procurment of equipment/items.

1.3 This specification including Test Schedule consisting of 18 pages holds good only for the supply order/acceptance of tender against which it is stated and issued.

1.4 This specification with accompaniments must be returned on sub mission of the tender/on completion of the order to the purchasing issuing authority of this specification.

1.5 The Controller,CQAE,Vishwakarma Vihar,Aundh Camp,Pune-411027 will be the Inspection Authority.

1.6 Enquiries regarding this specification and defence drawing listed in relation to toher than any contractual condition should be addressed to Inspection Authority.

1.7 Clause by clause details as per this specification to include complete information and details of equipment/items quoted shall be supplied alongwith the tender for detailed scrutiny by the inspection authority. Incomplete quotations are liable to be rejceted

1.8 No deviation will be accepted from goverinng design and drawings specification without the concurrence in writing from the inspection authority. No request for deviation will be entertained direltly from the sub ordered component manufacturer,if there are any ,only remain responsible for the quality/quantity in any fabrication done by sub-order component manufacturer.

1.9 The manufacturer shall extend to the inspection authority or his authorised representative free of cost all reasonable facilities for inspection and testing of the equipment., including the inspection gauges. For ensuring that the stores are manufactured in accordance with the specification and process quality control is exercised during manufacture and for this purpose the Inspection Authority or his authorised representative and inspection officer (IAO) and staff must have free access to the manufacturer of sub ordered compenent manufacturer's work at all times during the run of contract.

The manufacturer is required to notify the Inspection Authority ar and Inspecting Officer(IAO)of all sub orders placed by him with tw copies of each supply orders and provide all the Quality Assurance test facilities for all items/stores so sub-ordered.

1.10 Advance sample,if stipulated in the supply order/Acceptance of Tend are required to be submitted to the inspection aurhority at CQAE, Vishwakarma Vihar,Aundh Camp,Pune-411027 for testing and approval before undertaking manufacture of bulk supply . The bulk supply shall strictly be in accordance with the approved advance sample including improvement/modification and rectification as suggested while its acceptance.

1.11 An intermediate or the stage inspection that may be carried out for part of material/item must not be regarded as absolving the manufacturer from carrying out a comprehensive inspection on his own part,and such inspection is done without prejudice to the right to reject the finished article manufactured out of such mater item.

1.12 No part of the work shall be repaired or spoilt work ~~xxx~~ corrected without the prior approval of the Inspection Authority.

1.13 No equipment shall be despatched to the consignee until it has been officially released by the Inspection Authority (CQAE)or the inspecting officer(IAO)stipulated in the supply order/A.T.

1.14 When Government drawing specification or other documents are used for any purpose other than in connection with a definitely related Government procurement operation,the Indian Government thereby incur no responsibility for any obligation whatsoever and the fact that the Government may have formulated furnished or in any way ~~stipulx~~ supplied~~x~~ the said drawing,specification or other data is not be regarded by implication or otherwise as in any manner licencing the holder or any other person or corporation or conveying any rights or permission to manufacture,use or sell any patents invention that may be in any way related thereto.

1.15 Controller,CQAE as Inspection Authority is the final authority in case of any disputed regarding interpretation of specification, scope,checks and acceptance process/test schedule including final sentencing of stores.

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2.0 SCOPE AND END USE

2.1 This specification covers the general and technical requirement, material, manufacture, fabrication and quality assurance inspection including test and performance of Patches for Float of Bridge Assaul Floating, Hy(MM).

3.0 RELATED SPECIFICATIONS, DRAWINGS, DOCUMENTS

3.1 Specifications: The following specifications and standards have been conbulted while preparing this Defence Specification.

	Standards/Specifications		Specification/Code of Practice
3.1.1	IS:2062	-	Structural Steel(Standard Quality)
3.1.2	IS:380	-	French Chalk, Technical
3.1.3	IS:1503	-	~~Specification for~~ Wooden Packing cases.
3.1.4	IS:2102(Pt-I)	-	General tolerances for dimension and forms and positions.
3.1.5	IS:2500(Pt-I)	-	Sampling inspection tables. ~~Inspection by attribute, and by count of defects.~~
3.1.6	IS:2500(Pt-II)	-	Sampling Inspection Tables. Inspection by variables for percent defective.
3.1.7	IS:2508	-	Low density polythylene film .
3.1.8	IS:2629	-	Recommended Practice for hot-dip galvanising of iron and steel.
3.1.9	IS:3400	-	Methods of tests for vulcanised Rubbers.
3.1.10	IS:3400(Pt-I)	-	Method of tests for Vulcanised Rubbers. Tensile stress-strain properties.
3.1.11	IS:3400(Pt-II)	-	Method of Tests for vulcanised Rubber-Hardness
3.1.12	IS:4905	-	Method of random sampling.
3.1.13	IS:6662	-	Timber species suitable for wooden packaging.

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1* Procedure sampling plans indexed by acceptable quality level (AQL) for lot by lot inspection.

3.2 Drawings: The following governing drawings for the supply of to be referred:-

3.2.1 Drg No.-IMPD-0942/B- PATCH ,Round with 'D' Ring

3.2.2 Drg No.IMPD-0943/B - RING 'D'

3.2.3 Drg No.IMPD-0945/C - STRAP,Brass trapozoidal.

3.2.4 Drg No.IMPD-0946/B - PATCH,Oval with trapezoidal Ring.

3.2.5 Drg No.IMSA-0319/B PATCH,Rubber with handle.

3.2.6 Drg No.IMSA-0319/B Handle,Brass,strap

NOTES:

1. Indian Standard Specifications are obtainable from Bureau of Indian Standards,Manka Bhavan,9 Bahadur Shah Zafar Marg, New Delhi -110002 or their regional offices.
2. Copies of the drawings are obtainable from the Controller,CQAE, Vishwakarma Vihar ,Aundh Camp,Pune -411027 on hire,on payment (non-refundable).
3. Use of above listed drawings is mandatory in manufacture of patches.
4. Reference to this specification,to any Indian Standards or any other specification/drawing means in any tender/SO/A.T,the current on the date of such tander or contract.

4. BRIEF DESCRIPTION AND TECHNICAL REQUIREMENTS

4.0 The general description and technical requirements are as follows

4.1 Brief Description : These rubber patches are made of moulded rubber of various shapes/size with different types of metallic handles provided at re-inforced mooring. These are pasted on to the float in theri respective position. There are three varieties of patches. These are :-

4.1.1. Patch round with 'D'Ring(Cat/Pt No.14/5420-000068)

The metallic 'D'ring is of semi-circular shape as per drawing No.IMPD-0943/B This is used to secure the cap of valve insert with the help of nylon card.

4.1.2 Patch,Oval with trapezoidal ring(Cat/Pt No.14/5420-000070

The metallic handle(strap)is of trapezoidal shape as per drawing No.IMPD-0945/C This is used for holding the Saddle assembly in position of the float.

4.1.3 Patch,rubber with handle(Cat/pPt No.14/5420-000078)

The metallic handle is of trapezoidal shape as per drawing No. IMSA-0319/B This is used to held the cable,carrying by ... which the inflated float is carried by men.

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Material : Following material shall be used in the manufacture of various patches :-

0... .1 Rubber Compound :Polychloroprene rubber compound designed for achieving high resistance to ageing,weathering,abrasion and sea water an vulcanisation. The compound shall not contain any other rubber or reclaims. All the ingredients in the mix shall be free from grit and extraneous matter. The Polychloropren synthetic rubber used as proofing compound shall have the following properties:-

...2.1.1 Colour BLACK

...2.1.2 Polychloroprene Content: 40% (min)

When tested in accordance with the method given in Appx'A' to this specn.

...2.1.3 Tensile Strength : As per IS: 3400(Pt I)

- Before Ageing : 150 kg/cm2(min)
- After ageing at 100 oC for 168 hrs in air circulating oven. : Shall not decrease by more than 15% of before ageing (achieved) value.

...1.4 Elongation aat break : As per IS:3400(Pt I)

- Before ageing - 250% (min)
- After ageing at 100 oC ± 2oC for 168 hrs in air circulating oven - shall not decrease by more than 15% of the before ageing (achieved) ~~xixm~~ value.

...2.1.5 Hardness(Shore A) - As per IS:3400(Pt II)

- Before Ageing - 70° ± 2° IRHD.
- After ageing at 100 oC ± 2oC for 168 hrs in air circulating oven. - shall not change more than 5 units of before ageing (achieved)value.

04.2.2 Fabric/Yarn for Reinforcement: For reinforcement of Rubber at Mooring,high tenacity,heat set Nylon fabric (wt per sqm 200-240 g shall be used in four layers. ~~Alternately~~ high tenacity nylon yarn can also be used. The responsibility of selection of a suitable basic fabric rests entirely with the Contractor. The basic fabric shall be reasonably free from defects. The basic fabric selected shall be able to meet the requirements of pull strength specified in clause 4.5 of this specification. The physical and mechanical properties of nylon fabric is listed below are for guidance only :-

of manufacturer

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which may achieve the required pull strength

Alternatively

4.2.2	Weight	:	200-240 g/m2
4.2.2.2	Breaking strength (Warp & Weft)	:	300 kgf(min)
4.2.2.3	Elongation at break (Warp & Weft)	:	30% max.
4.2.2.4	Denier of Yarn (Warp & Weft)	:	210 x 4 or 840
4.2.2.5	Threads per cm (Warp & Weft)	:	12
4.2.6	Weave	:	Plain
4.2.7	Finish	:	Heat Set
4.2.8	Material	:	Nylon 6 or 66.

Note: Nylon fabric/yarn shall pretreated with suitable chemical composition such as isocyanates, Vinyl Pyridine latex or resorcinol formaldehyde to impart firm adhesion with polychloroprene rubber.

4.3 Metallic Parts: The metallic strap/handles/rings of shape and dimension as per their relevant drawings shall be of steel construction, conforming to steel grade ~~Fe 410 S(St 42 S)IS:226.~~ 'A' Fe 410 WA as per IS:2062

Manufacture, Finish & Workmanship, Test and Identification Marking

4.3.1 Manufacture : The RUBBER rubber patches shall be manufactured of the materials, shape and dimensions as specified in relevant drawings. The strap/handles/rings shall be manufactured of the material, shape and dimensions specificed in relevantd drawings. The welding of the strap handles/rings shall be carried out by gas welding or metal arc welding. Precaution is to be taken during welding to avoid warpage and distortion. The surface to be welded shall be suitably degreased to remove oily matters. The edges to be welded shall be scratch brushed just before welding. The strap/handles/rings after finishing (galvanising) shall securely positioned and moulded with rubber part by re-incorcing with four layers of nylon fabric/yarn as stated in clause 4.2.2 above at the mooring. The Straps/handles/rings shall be got checked by the inspector concerned (QAO) for its welding, dimension and coating prior to moulding on Rubber Shaped parts.

4.4 Finish and Workmanship: Following are the finish and workmanship required :-

4.4.1 Straps/Handles/Rings : Shall be finished smooth and clear. All sharpness shall be removed and finished before galvanising. These shall be galvanised and chromatised to coating thickness of minimum 50 to 60 microns, conforming to IS:2629

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4.4.2 Rubber Parts: These shall be finished smooth and glossy. The moulding at mooring shall be smooth and no fabric shall be visible. The patches shall be free from any surface irregularities eg. blisters, porosity and blooming of any ingredients of the rubber compound. The metallic handle/strap/ring shall have free rotation at mooring.

4.5 Pull Strength Test: Each type of patch shall be subjected to pull strength test and shall satisfy the requirement as per details attached at Appx'A2' to this specification.

4.6 Identification and Marking: Each type of patch shall be clearly and legibly marked with nomenclature, firm's name or trade mark, batch No. month and year of manufacture. The marking shall be with 10 mm high character of numericals and may be embossed or by any other suitable method convenient to themanufacturer in yellow colour for proper identification and be of permanent nature. Following code for nomenclature is suggested: - This should be followed by other details.

4.6.1 Patch, Round with D-ring - PRDR

4.6.2 Patch, Oval with trapezoical ring - POTR

4.6.3 Patch, rubber with handle - PRH

PACKAGING

05.1 In order to ensure that the patches reach the consignee in perfect and serviceable condition and fit for use, proper packing of these patches are necessary.

05.2 Only those patches having acceptance inspection mark shall be packed. Before packing all the patches shall be cleaned, free from dust, mould release agents etc present on the surface and then dusted liberally with french chalk conforming to IS:380 on both the surface for preservation while in storage. The dusted patch round with 'D' ring (100 in No) shall then be packed in one bag while other patches shall be packed one in each bag. The bags are made from 0.04 mm thick polythene film conforming to IS:2508. These bags shall then be closed by heat sealing, Requisite No of such patches shall be packed in rectangular wooden packing case of suitable size, so that overall weight is within 50 kg, conforming to class 'C' style '1' to specification No.1503. The timber species shall be any one of the group if timber to IS:6662 and moisture content shall be between 10 to 15%. The packing case shall be treated with 2% copper in copper Napthanate solution.

05.3 Each wooden packing case shall contain only one type of patch.

05.4 Each package shall contain a packing note, indicating the nomenclature of the patch, cat part No. supply order No, date contractor's name and quantity packed alongwith weight and inspection note details.

These wooden cases shall then be securely stapped with hoop iron strappings or metal wires at suitable interval as further measure of safety. On packing case following information shall be stencilled in black ink with 25 mm high character/numericals :-

- Description of stores
- Qty Packed
- Overall weight
- Firm's Name
- Consignee address & other details.
- A/T,S/O Reference
- I Note No.& Date

05.5 Each package shall also bear acceptance inspection mark as suggested in clause 4.6. above.

GENERAL REQUIREMENT

06. Notwithstanding the requirements listed above, the manufacturer shall ensure that Patches under supply fully conform to contract specification and other requirements in terms of manufacture, workmenship, finish & packing.

WARRANTY

07. Each lot of Patches supplied against the order shall be deemed to bear warranty of the contractor against all defects in material, workmanship, finish and performance for a period of 12 months from the date of receipt of the stores at consignee's depot. If during the period the stores supplied are found by the consignee to be defective then the purchaser shall be entitled to call upon the contractor to rectify/or replace the defective stores, immediately within such apperiod as may be fixed by the purchaser/inspection authority for the purpose. The stores so replaced/rectified shall be deemed to bear warranty period as mentioned above, from the date of replacement/rectification. If any of the portions of the stores are consumed, the contractor will also be liable to compensate the purchaser in the of price reduction for the stores so consumed, such price reduction being decided by the purchase officer/inspection authority.

QUALITY ASSURANCE INSPECTION

.1 The Inspection(QA)Authority for Patches being procured as per this specification shall be the Controller, CQA(E), Vishwakarma Vihar Aundh Camp, Pune-411027. Depending upon the area in which the contractor/manfacturer is located, the quality Assurance Officer for bulk inspection(QA)shall be indicated in the contract.

.2 Advance Sample

.2.1 On conclusion of supply order/Acceptance of Tender, firm shall submit 12 Nos of Patches of each type of acceptable quality as specified in this specification/drawing including three sheets of vulcanised rubber compound each of sizes 33 x 500 2.5 mm thick and 50x 50x 7mm thick to CQAE(E), Vishwakarma Vihar, at Aundh Camp, Pune-411027 in finished condition alongwith comp packing case for detailed tests and approval. The rubber are to be vulcanised to the degree and manner as the patches.

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Firm shall submit his preinspection report including all tests results and dimensional observations. The rubber sheets are to be vulcanised to the same degree and manner as the Patches.

8.2.2 The vulcanised sheets will be tested for material tests for its conformity to the required properties as in clause 4.2.1 above.

8.2.3 Each of the Patch will be subjected to dimensional checks as per relevant drawing, pull tests as described at Appx'Az' to the specification and Packaging details.

8.2.4 Bulk production of stores shall be permitted only if advance sample are found conforming to this specification in all respects. The advance samples are likely to be subjected to destructive test if required for testing the quality of rubber and other constructional details.

BULK SUPPLIES INSPECTION(QA)

09. The bulk production inspection(Quality Assurance)shall be performed by the Inspecting Officer(QAO)as indicated in the supply order/Acceptance of Tender at manufacturer's premises as declared in the S/O,A/T. On acceptance of advance samples by the Controller,CQAE, the bulk production inspection(Quality Assurance) shall be conducted in following stages:-

09.1 Pre-inspection report of manufacturer: It is mandatory on the part of manufacturer that before tendering the bulk store for quality assurance inspection, he shall carryout a thorough pre-inspection of each lot/deliverly to ensure that the stores fully conform to this specification and drawing in every respect. A certificate and detailed report to this effect on approved ~~xx~~ check sheet which will include material test results/certificate dimensional details and performance test details as stipulated in this specification and drawing shall be submitted by the manufacturer while tendering the bulk stores for inspection. If pre-inspection of lot as required has not been carried out by the manufacturer, the lot is liable for rejection.

09.2. Bulk Production Inspection(Quality Assurance): The bulk production inspection(Quality Assurance)shall be performed strictly as per the inspection process as Test Schedule No. INSP/ENGR/1075 by the Inspecting Officer(QAO)/Inspection staff as indicated.

Appendix'A1' To Specification No. IND/ENG/PROV/1180 Refer para 4.2.1 (c)

Scope

POLYCHLOROPRENE RUBBER CONTENT

A1. This method covers the determination of polychloroprene rubber content by Sodium Carbonate fusion method in rubber compounds(not containing any other chlorine containing material).

Procedure

A1.2 In case the specimen drawin containing nylon fabric/fabrics seperate the Vulcanised rubber layers completely from the fabric divide it into fine particles and weigh accurately about 0.5 g of sample. Transfer the weighed rubber pieces into a platinum crucible containing a bed of Na2 CO3(AR Quality)and completely cover the rubber particles with more quantity of Na2 Co3. Place another smaller platinum crucible(upside down)inside the larger platinum crucible(containing embedded rubber particles). Seal the gap all around the periphery of smaller crucible and top it up with Na Co3. Ensure that Na2 Co3 sealing is perfect so as to completely entrap the escaping gas.

A1.3 Heat the platinum crucible on a Bunsen Flame first gently for about 30 minutes and then vigrously to red heat for one hour to allow complete fusion of rubber with Na2 Co3.

A1.4 Remove the bruner and allow the crucibles to cool down to room temperature. Transfer the crucibles with contents to a one litre pyrex breaker. Dissolve the contents in distilled water and add HNo 3(prefarably 10N to 15 N)to neatralise excess of Na2 CO3. Add a few mls HNO3 in excess,filter the contents in another beaker. Give two to three distilled water washingss to filter paper,reject the residue. To the filtrate add Ag No3(AR 10 per cent)solution to precipitate Agcl. Complete the precipitation. Filter the contents through sintered glass crucible which is previously weighed to constant weight wash with distilled water containing few drops of HNO3. Keep the crucible in oven at 105°C to evaporate the moisture and dry it to a constant weight. Determine the weight of silver chloride,as per the following :-

$$\text{Polychloroprene Rubber Content}(\%) = \frac{\text{Weight of Agcl ppt} \times 100 \times 35}{143.5 \times 0.37 \times \text{weight of sample taken.}}$$

A1.5 Alternatively the Parr bomb peroxide combustion method(as per BS 903)using chloride free Sodium Peroxide should be followed. Usually a blank test will be necessary.

Appx'A2'To Specification No. IND/ENG/PROV/1180 (c

(Refers to para 4.5)

PULL STRENGTH TEST

A2. Pull Strength Test : Each type of patches shall be subjected to pull strength test as described below :-

A2.1 Preparation of specimen: The back surface of rubber moulding of Patches shall be buffed lightly with emery paper and then pasted with appropriate adhesive on similarly buffed strip of polychloreprene coated nylon fabric double texture (KK-600 can be purchased by the firm through source to be indicated by Inspection Authority separately), of same width as that of patches and of sufficient length to hold the free ends of the strip on a grip of open jaw of tensile testing machine. Sufficient time is allowed for the adhesive to cure. The specimen is then conditioned for 48 h at 65 ± 2% RH at 27 ± 2°C.

A2.2 Conduct of Pull strength Test : Free ends of the strip shall be gripped in one of the open jaw. A saddle strap or webbing of suitable width having breaking strength of the order of 1500 kgf(min)shall be passed through the handle and then gripped on the other jaw. A wooden black of approximate size can be kept on the back side of the moulding,if necessary to retain metallic handles of rubber shaped parts in its position throughout the pull strength test. The test will be conducted on tensile testing machine ,with constant rate of traverse of 100 ± 10 mm/min.

A2.3 Each type of patch ~~xxxx~~ specimen before ageing and after ageing at 100°C ± 2°C for 168 h in air circulation type oven shall not show any sign of failure or tearing specially at mooring when subjected to following loading.

	Full Strength(Kgf)	
	Before Ageing	After Ageing
A2.3.1 Patch,Round with D Ring Transverse direction pull	60	55
A2.3.2 Patch,oval with Trapizoidal ring		
Main direction pull	300	270
Counter direction pull	200	180
A2.3.3 Patch,rubber with handle		
Tranverse ~~direction pull~~	550.	500

TEST SCHEDULE NO ENGR/TS/1075 /b

QUALITY ASSURANCE ACCEPTANCE PROCESS AND TEST SCHEDULE FOR BULK/INSPECTION

FOR

PATCHES FOR FLOAT

01. This quality assurance acceptance process and test schedule lays down the quality assurance acceptance checks, test and performance requirements.

02. This test schedule is issued to guide the manufacturer on the inspection process and tests. Nothing in the schedule absolves manufacturer his responsibility to ensure that the quality assuranc requirements are met with strictly as per the terms of contract the supplies are upto the requirement of the contract specification, contract agreement and advance sample sentencing repo

03. During the application of the schedule, if it is found that further aspects which should adventageously be included in this schedule such aspects should be brought to the notice of Controller, CQAE, Vishwakarma Vihar, Aundh Camp, Pune -411027.

04. For proper conduct of checks/tests, it is necessary that all the relevant standards, specification are studied properly, test/ recording procedure and computation of test results are properly understood. A detailed quality assurance check sheet for various checks and tests and their systematic recordsings shall be propared by the manufacturer and get approved before its use. The proinspection report to be submitted by the firm alongwith each inspection call letter during bulk supply, shall be on these formats.

05. The manufacturer shall extend to the inspection authority, ie, Controller, CQAE or his authorised representative and Inspecting Officer(QAO) and Inspection staff, free of cost all assistance including the reasonable test facilities like laboratory for testing various materials, special arrangement if any for performance test/trial. The manufacturer shall produce on demand or shall arrange all measuring instruments needed for measurement of dimensions and labour requirement if any for handling of stores under inspection. He shall arrange proper ligting and ventilation arrangements at inspection bay, so as to give reasonably confortable working condition to the Quality Assurance Officer/staff for detailed inspection/checks/tests.

RANDOM SAMPLING METHOD AND SAMPLING PLANS

06. The samples of patches to be drawn for various tests and inspection shall be at random, without regard to their quality as described in IS:4905. These samples shall be serially numbered and clearly marked for their easy identification at later date. The member of samples to be drawin to meet the sample size(number of units or product in the sample) shall be as per various sampling plans given on next page.

Avide CQAE Letter no.

06.1 Single sampling variable Plan for variability unknown standard Deviation Method or range method: These plans shall be accepted for testing and inspection of various specified properties and specification requirement of vulcanised proofing rubber compound sheet like polychloroprene content, tensile properties, hardness (and only polychloroprene content and hardness of various patches) and the pull strength test. Sentencing of the samples and the lot shall be based on relevant calculations as described in IS:2500 (Pt II) adopting AQL 4% for critical parameters. The sample size shall be as given below for various lot sizes:-

Lot size	Sample size (Inspection Level I)
03-25	3
26-50	3
51-100	3
101-150	3
151-300	3
301-500	3
501-1000	4

Note : The minimum size of lot to be offered for inspection shall be 51 and above.

6.2 Double sampling inspection plan (by attributes and count of defective): This sampling plan shall be adopted for inspection of all major and minor parameters like dimensional requirements, construction workmanship, finish, galvanising coating thickness of straps/handles/rings, welding soundness, identification marking on individual patches, packing adequacy and other specification requirements. Sentencing of the samples and the lot shall be as per double sampling plan of Table 3 and procedure described in IS:2500(Pt I). The number of defective patches are considered either for acceptance or rejection. If the total number defective patches in the sample size exceeds the acceptance number, the lot shall be rejected. The sample size, AQL for various class of defects/parameters, Acceptance Number (A/N) and Rejection Number (RN) based on inspection level IV for various lot size shall be as given on page No. 14.

06.1 Single sampling variable Plan for variability unknown standard Deviation Method or range method: These plans shall be accepted for testing and inspection of various specified properties and specification requirement of vulcanised proofing rubber compound sheet like polychloroprene content, tensile properties, hardness (and only polychloroprene content and hardness of various patches) and the pull strength test. Sentencing of the samples and the lot shall be based on relevant calculations as described in IS:2500 (Pt II) adopting AQL 4% for critical parameters. The sample size shall be as given below for various lot sizes:-

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Lot Size	Sample F-First S-Second	Sample Size Inspection IV	Cumulative Sample Size	AQL Major(6.5%) AN	AQL Major(6.5%) RN	AQL Minor (10%) AN	AQL Minor (10%) RN
16-50	F	5	5	0	2	0	3
	S	5	10	1	2	3	4
51-100	F	8	8	0	3	1	4
	S	8	16	3	4	4	5
101-151	F	13	13	1	4	2	5
	S	13	26	4	5	6	7
151-300	F	20	20	2	5	3	7
	S	20	40	6	7	8	9
301-500	F	32	32	3	7	5	9
	S	32	64	8	9	12	13
501-1000	F	50	50	5	9	7	11
	S	50	100	12	13	18	19

CLASSIFICATION OF DEFECTS/PARAMETERS

07. Non conformance of rubber patches to specified requirements are classified into the following:-

07.1 Critical defects/parameters: Rubber Patch material not conforming to polychloroprene content, tensile properties and hardness, patches not meeting the chloroprene content, hardness and durability of Patches is classified as critical defect/ parameter.

07.2 Major defects/parameters: Rubber Patches not meeting dimensional requirement, construction workmanship, finish, galvanising coating thickness of straps/handles/rings not meeting specification requirement, welding soundness workmanship and finish which are likely to affect or reduce serviceability or durability is classified as major defects/parameters ability or durability is

07.3 Minor defects/parameters: Rubber patches not meeting individual identification marking, packaging requirement and these parameters having little bearing on the effective use as classified as minor defects/parameters.

...SS AND ITEMS TO BE REFERRED DURING QUALITY ASSURANCE PROCESS, ... AND INSPECTION

08. Following specification, drawing, standards and documents shall be referred for guidance and further details:-

08.1 Specification No. IND/ENG/PROV/1180/C and connected drawings.

08.2 Advance sample report relevant to patches under inspection (to be supplied separately after advance sample inspection).

08.3 Approved advance sample of Patches, if any.

08.4 IS:4905 : Method of random sampling.

08.5 IS:2500(Pt I): Sampling Inspection Tables Inspection by attributes & by count of defect.

08.6 IS:2500(Part II): Sampling Inspection Tables Inspection by variables for percent defective.

...MITTED BY MANUFACTURER's PRE-INSPECTION REPORT

09. The manufacturer of Patches alongwith inspection call letter shall produce his pre-inspection report indicating the total quantity and types of Patches offered. The pre-inspection report shall be on the approved check sheets and shall include complete dimensional check recordings, material tests and results of all material test results. The patches shall be offered complete in all respect duly packed. The manufacturer shall also submit vulcanised rubber sheets of size 300 x 300 x 2.5 mm and 50x50x7mm 2 No. of each size for each lot of Patches offered for inspection. In case the pre-inspection report is not submitted or found to be complete the inspection call letter shall be disposed off indicating the reasons.

INITIAL VISUAL INSPECTION

10. In case the firm's inspection call letter is found acceptable, before proceeding with the details inspection, initial visual inspection of the lot offered shall be carried out. This will include counting of total quantity of packaging offered, completeness of patches, identification marking, packaging and its adequacy. In case no discrepancies are found in the lot offered, further inspection shall be continued.

TEST FOR POLYCHLOROPRENE CONTENT & TENSILE PROPERTIES, HARDNESS OF VULCANISED RUBBER SHEET

11. Polychloroprene content of vulcanised rubber sheet submitted by the manufacturer for each lot shall be checked. The vulcanised rubber sheet shall also be tested for the hardness and tensile properties precribed in the specification. In case the vulcanised rubber sheets are not submitted as alternative to this test, samples of each type of patches drawn at random as per smapling plan indicated at para 6.2 above shall be checked for Polychloroprene content and hardness test.

PARA 13.1 to 13.5

ITEM	TESTS	PARAMETERS TO BE CHECKED	REMARKS
Patch Round with D ring	1) Visual Inspection	100% stores duly assembled with all components shall be checked visually for quantity, workmanship, galvanising P components. Rubber components should be free from any irrgulenties, Porosity and ~~from~~ blooming free rotation rotation of Handles as mooring	
Patch rubber with Handle	Raw Material		
	a) Rubber compound	As per clause No 4.2.1 and check before commencement of bulk production and at any stage of production for uniform raw meterial	The sample specimens sizes shall be as per clause ~~of~~ 08.0.2.01 of specificatio
	b) Metalic component	shall be chcked as per clause 4:2:3 for chemical and Mechanical parameters and confirm the IS:2062	The raw material shall b choose from any lot before commencement of bulk.
	c) Fabric/Yarn	shall be checked as per clause 4:2:2 for physical and chemical properties, and meet the pull strength specified in Appendix 'A2'	-do-
	3)Dimensional check-	The dimensional check shall be carried out as per drawing mentioned in clause 3:2	A suitable random sampling plan shall be choosen from IS:2500 for any lot as per cl. 06 of IS
	4) Surface treatment test galvanising	Straps/Handles and Ring shall be checked for coating thickness as per cl 4.4.1	Same as per test Nos. 3
	5. Pull strength Test	Each type of patch shall be checked for pull strength test as per Appendix A2	Same as per test Nos.3
	6. Identification Marking and packing	Identification, and marking shall be check as per clause	100% checking shall be carried out.

FINAL STAMPING

14. In case the Patches qualify in all the above test/check, Acceptance Inspection Mar shall be affixed on the upper face. It should be prominent and should be easily recognisable even after a period of time

RELEASE OF PATCHES FOR DESPATCH AND QUALITY ASSURANCE RECORD

15. Before relasing the Patches for despatch all the packages opened for drawing samples shall be get re-wrapped/re-packed and record to this effect made on the check sheet. Following action will be taken for the quality assurance record:-

15.1 While issuing acceptance inspection note, under the remarks column, the manner and place of affixing inspection mark (both stage & final) on patches, total number of boxes, number of patches in each package shall clearly be indicated.

15.2 A complete test report of rubber, pull strength test results and the quality assurance inspection details and observation shall be systematically recorded and maintained on the check sheet

15.3 The patches duly inspected as above shall also be subjected to second and third tier inspection by the inspecting officer.