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GOVERNMENT OF INDIA

MINISTRY OF DEFENCE

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दिनांक 21-5-05

DIRECTORATE GENERAL OF QUALITY ASSURANCE

DEFENCE SPECIFICATION

FOR

ADHESIVE

CAT PART NO. 8040-000138

SPECIFICATION

NO. IND/ENG/PROV/1193/d -2004

(Supersedes Specification NO. IND/ENG/PROV/1193/c -2001)

इस तारास को विनिर्देश
की प्रमाणित प्रतिलिपि
Certified Copy of
Specification at
this date 14 may.05

Km. Jatri
24/5/05

M.L. MITTAL,
J.S.O.
CQAE, Aundh Camp,
Pune 411027

ISSUED BY

CONTROLLERATE OF QUALITY ASSURANCE

ENGINEERING EQUIPMENT

AUNDH CAMP, PUNE - 411 027.

DATE: MAR 2004

PRICE: Rs 150/-

C.T.C.
14/05/2004.

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RECORD OF AMENDMENTS

AMENDMENT	DETAILS OF AMENDMENT	CARRIED OUT BY & DATE
----- 02	The specification is computerised and made in JSG 031 Format All specn (IS) have been updated.	

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DEFENCE SPECIFICATION

FOR
ADHESIVE

FOREWORD

This specification has been prepared by the Controllerate of Quality Assurance (Engineering Equipment), Aundh Camp, Pune-411 027 on behalf of Director General Quality Assurance, Ministry of Defence, New Delhi.

This specification supersedes earlier specification No IND/ENG/PROV/1193/C.

This specification has been prepared to lay down general requirements and to be used to guide /manufacture/Quality Assurance/ Inspection of Adhesive.

This specification consisting of 19 pages.

This specification shall be used for tender enquiry, procurement, manufacture and quality assurance propose of the equipment covered in the specification.

This specification is restricted document and therefore should not be communicated to anyone who is not authorised to receive it.

This specification with accompaniments should be returned to issuing /store purchasing authority, on completion of tender formalities or completion of supply order.

The Controller, CQAE, Aundh camp, Pune-411 027 is the (AHSP) Authority Holding Sealed Particulars and doubt, regarding any statement covered by this specification shall be referred to the AHSP who will clarify the same. In case of any anomaly, the AHSP's decision on technical requirement shall be final and binding on the supplier. Any legal or contractual condition shall be referred to the contract placing authority.

The Quality Assurance Authority for the item covered in this specification is the Controller, CQAE Aundh Camp, Pune -411 027 and Quality Assurance of the area concerned will be the Senior Quality Assurance Officer (SQA) of Senior Quality Assurance Establishment (Engg Eqpt) located at Mumbai, Kolkata, Chennai, New Delhi or an officer nominated by him. SQA shall carry out bulk Quality Assurance of the item.

Clause by clause reference of this specification should be confirm in writing along with tender enquiry documents/quotation, otherwise the tender documents are liable to be rejected due to incomplete /inadequate details.

No deviation for stipulated parameter of specification /drawing will be accepted without the concurrence in writing by AHSP and no request will be entertained directly from sub-contractor, if any. The main contractor shall remain responsible for the quality of the product.

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- 0.11 The contractor shall extend to the defence QA authority or his authorised representative all reasonable facilities for QA and testing of the equipment including gauges free of cost. In order to ensure that the stores ordered are produced strictly as per this governing specification The QA Authority or his authorized representative will be provided free access from raw material to dispatch stage at the manufacturer's works at all times during the currency of the contract. If the need is felt, he will also have free access to procurement document including books of accounts. In case sub order are placed on sub contractors, the prior approval of sub contractors by AHSP shall be obtained and copies of sub contract shall be provided to AHSP and the QAO of the area concerned. All inspection and test facilities shall be provided free of cost for the sub contracted items.
- 0.12 Advance or Pilot samples, if any, stipulated in the contract are required to be submitted to the inspection authority at CQAE, Aundh Camp, Pune - 411 027 on door delivery, free transportation / handling cost within stipulated delivery period for testing and approval before undertaking bulk manufacture of item and bulk manufacture, if undertaken by the contractor, prior to approval of advance / pilot sample will be at the risk and cost of the supplier / contractor. The bulk supplies will be effected strictly as per the approved advance/pilot sample including any improvement / modification suggested during approval of the advance / pilot sample.
- 0.13 Stage Inspection will be carried out right from raw material stage to dispatch of the stores and such stage inspection shall not be construed as absolving the contractor of his responsibility in carrying out a comprehensive pre-inspection on his own part and stage inspection by defence QA agency i e without any prejudice to the right to reject the complete /offered article manufactured from such stage inspected components/sub assemblies/assemblies, if found not conforming to specified requirements.
- 0.14 Any of the defects as notified during inspection by QA agency shall not be rectified /repaired without prior approval of the defence QA agency.
- 0.15 The manufacturer/contractor is required to incorporate latest technology, state of the art manufacturing procedures and test methods in turning out the product in meeting the requirements of reliability, serviceability, interchangeability and durability of the product.
- 0.16 The warning/safety aspect of the store has to be kept as per standard practice. Guidance in manufacture of the store shall be taken from patent or samples, if any available with the defence authorities.
- 0.17 Copies of any national or international or any other specifications, instructions or guides stipulated in this specification for reference shall be obtained from the publishers of the respective documents. The latest version of these documents shall be applicable.
- 0.18 This specification shall be used for the sole purpose of manufacturing and supplying the store to the defence indenter against a specific contract only and not for any other purpose whatsoever.

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- 0.19 The manufacturer/suppliers are required to provide all necessary technical information for defence to fully identify the item. This information is required codification purposes only and in no way jeopardize the commercial interest of the suppliers. Non-compliance of this requirement by contractor is likely to render his bid for supplying defence equipment being rejected.

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01. SCOPE

This specification covers the general and technical requirements of formulation, manufacturing, packaging and Quality Assurance, Inspection including laboratory test and performance of polychloroprene Adhesives natural colour (Type A) and Adhesive black colour (Type B).

02. RELATED SPECIFICATIONS

The following specifications have been consulted while preparing this Defence Specification :-

IS : 5	Colours for ready mixed paints and enamels
IS : 2500 (part I)	Sampling inspection procedures
IS : 2552	Steel drums (Galvanized and ungalvanized)
IS : 2560	Rubber based adhesives (for Tubes non curing)
IS : 3071	Specification for wooden crates.
IS : 4905	Method for random sampling
IS : 6662	Timber species suitable for wooden packaging
IS : 7394	Specification for Plastics Containers for reserve fuel.

Defence specification

CQAE/9320/1372/d – KK 600 – Polychloroprene Coated, Nylon Fabric, Double texture, and single texture (i.e. KK –600/KK-200)

Note

1. Indian standard specifications are obtainable from Bureau of Indian Standards, Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi-110002 or other regional offices.
2. Copies of Defence specification and drawing are obtainable from the Controller, CQAE, Aundh Camp, Pune-411027 on hire charges (non refundable).
3. Reference to this specification in relation to any Indian Standard or any other specification/drawing in any tender enquiry or supply orders or acceptance of Tenders means specification/drawing in the current edition at the date of such tender/contract.

03. GENERAL DESCRIPTION AND COMPOSITION

The general description and composition are as follows :-

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DESCRIPTION Polychloroprene Rubber Adhesives are used in the repair of floats manufactured out of rubberized nylon fabric (e.g. -200, KK-7 etc). These adhesives are cold curing type and consist of (i) Polychloroprene Rubber Adhesives (first component) and (ii) cross linking agent (second component). The adhesives are packed in 5 kg airtight container and cross linking agent is packed in 1 kg airtight container.

POSITION : The composition of two components of adhesive shall be as follows :-

ADHESIVE (FIRST COMPONENT) : The adhesive of polychloroprene grade rubber shall be compounded with suitable antioxidants, acid acceptors and other compounding ingredients. The compounded rubber shall be dissolved in a mixture of suitable solvents properly, so as to give a homogenous solution with a solid content of 20 +/- 2% at 27 degree C. The adhesive (first component) is of two type as described below :-

3.2.1.1 **ADHESIVE TYPE 'A'** This shall have the natural colour of the compounded rubber. This may also be supplied in Olive Green (O.G.). Colour if specifically mentioned in the order. The colour shade shall conform to ISC No 294 same as to IS :5.

3.2.1.2 **ADHESIVE TYPE 'B'** This shall be black in colour i.e. the compounded rubber shall contain some quantity of carbon black.

3.2.1.3 The suggested formulations for two type of adhesives are given below :-

Contents	Natural colour (Type 'A')	Black colour (Type 'B')
Polychloroprene rubber	80% (min)	80% (min)
Magnesium oxide	3.5% (min)	3.5% (min)
Zinc oxide	3.5% (min)	3.5% (min)
Resin compatible with polychloroprene rubber	13.0%	8-10%
Carbon black	-	3-5%
Colouring agent	Olive green	-

CROSS LINKING AGENT (SECOND COMPONENT) The second component shall be a cross linking agent consisting of 20% solution of 4.4. "4" trilosocyanate in methylene chloride or its

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equivalent. The quantity of second component supplied shall be 5% by weight of the first component.

CAUTION : The solvents used for adhesive shall be of non-toxic in nature, it shall not cause health hazard i.e irritation to eyes, nose and skin of its users and shall have no objectionable fumes or odour. The Inspection Authority/consignee shall have the right to reject the adhesive in case if it is found that the workers find it difficult to work in the atmosphere of vapours of the solvents of adhesive/cross linking agent.

NOTE : The supplier shall indicate the actual proportion of the cross linking agent required to be used with the adhesive and shall supply the required quantity subject to a minimum of 5% by weight of the first component.

4. **TECHNICAL REQUIREMENT** : The adhesive mixed with the requisite proportion of cross linking agent (as recommended by the supplier) shall meet the following requirements at a temperatures of 27 +/- 2 degree C and relative humidity of 65 +/- 5%.

4.1 **POT LIFE** : The pot life of the adhesive shall not be less than 04 hours when tested in accordance with method described at Appendix 'A' attached to this specification.

4.2 **COVERAGE/SPREADING** : The coverage/spreading value of the adhesive shall not be less than 3 (three) square metre per kg, when applied as per method described at appendix 'B' attached to this specification.

4.3 **TACK DRY STATE AND TACK RANGE** : The adhesive film shall achieve tack dry state within 20 minutes of application. The adhesive film shall have a tack range of minimum 45 minutes, i.e. the film shall remain in tack dry stage for a minimum period of 45 minutes without impairing its bonding characteristics.

4.4 **BOND STRENGTH** : Specimen of fabric Kk-600 of size 5 cm x 5 cm size (obtainable from manufacturers registered with CQAE) bonded with adhesive bond strength determined as per method described in Appendix 'C' attached to this specification shall show the following results :

Aspects	Bond strength (kgf)
4.4.1 The specimen joined together after 15 minutes of application of the adhesive	450 (min)
4.4.2 The specimen joined together after 45 minutes of application of the adhesive	450 (min)

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- 4.4.3 After ageing of the above specimen at 100 degree C for 7 days Shall not decrease by more than 10% of strength in kgf that was observed before ageing of specimen
- 4.4.4 Specimen joined together 45 minutes after application of the adhesive and then immersed in water at 50 +/- 2 degree C for 72h Shall not decrease by more than 10% of strength in kgf that was observed before ageing of specimen

4.5 **TRANSPARANCY** : The transparency of the natural colour adhesive type 'A' shall be such as, not to mask the visibility of red/yellow pencil marks that was drawn on black surface after application of the adhesive.

4.6 **CONSISTENCY** : The consistency of the adhesives shall be such that it is suitable for brush application.

4.7 **CONTAINER** : The material of the container for adhesive and cross linking agent shall fully comply with the requirement of IS : 2552, grade A2 and containers shall conform to double seam construction as explained in the IS : 2552. The size of the containers shall be such that each can accommodate 5 kg adhesive and 1 kg cross linking agent respectively. The containers shall be provided with drop wire handles fixed at positions convenient for handling. The manufacture may also use high/low density polyethine container conforming to IS : 7394 plastics containers in lieu of metal containers for adhesives and cross linking agents. The containers should be hermetically sealed. The handles should be built in with the container.

4.8 **CRATE** : Construction of crate shall comply the requirement of type 1E : style 5 of IS : 3071. Timber species shall be used as per group III of IS : 6662. Only one type of species of timber shall be used in manufacture of crate. The timber shall be seasoned to moisture content of not exceeding 10 percent and shall be free from pith, insect attack, non objectional knots, warping, splits and pin hole of powder post beetles.

MANUFACTURE OF ADHESIVE, CONTAINERS AND CRATE

5.1 **ADHESIVE** : The adhesive and cross linking agent shall be manufactured with formulation of the materials as suggested at para 3.2.1.3 to 3.2.2 above.

5.2 **CONTAINER** : The container shall be manufactured such that the body of the same shall be plain and cylindrical in shape with provision of double lid

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for the purpose of hermetical sealing of contents. Top and bottom of the container shall be plain.

5.3 **CRATE** : Crate shall be manufactured as per requirement described at para 4.8 above. Nails shall be driven without splitting the frame members and weakening the joint in staggered rows to make a stronger joint. The entire crate box surface shall be treated with copper naphthanate solution with 2% copper by brushing.

6. **FINISH OF ADHESIVES, CONTAINER AND CRATE**

6.1 **ADHESIVE** : The adhesives manufactured shall be free from any visible/suspended impurities or agglomerates of rubber compound.

6.2 **CONTAINER** : The containers shall be smooth finish all over. The general finish shall be of high standard and it shall be in a clean condition. The inside of the container shall be free from traces of rust and foreign matter. The outside and inside surface of the containers shall be given satisfactory protective coating to prevent rusting, in case of metallic containers.

6.3 **CRATE** : All the frame members shall be of even thickness, rectangular section trimmed square at ends and reasonably smooth. Where necessary, the nails shall be clinched and clinching shall be done along the grain of the timber.

7. **TEST FOR ADHESIVES, CONTAINER, CRATE**

7.1 **ADHESIVES** : The adhesive shall be subjected to various laboratory and performance tests and shall satisfy the requirements as described at para 3 & 4 above of this specification.

7.2 **CONTAINERS** : The adhesive and Cross linking Agent containers duly filled in & sealed are subjected to drop test, keeping its diagonal in vertical position. The containers of adhesives and Cross Linking Agent shall not distort and show any sign of leakage when dropped FOUR times from a height of one metre on a concrete floor, arranging in such a manner that the following four points of the drum stick the floor on each drop in turn. The containers made out of high /low density polyethylene shall be tested as per IS : 7394 after the same is filled with specified quantity of adhesive.

7.2.1 The bottom rim near its junction with the side seam.

7.2.2 The top rim near its junction with the side seam.

7.2.3 The bottom rim diametrically opposite the position at 7.2.1

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7.2.4 The top rim diametrically opposite the position of para 7.2.2.

7.3 **CRATE** : In order to ensure sound construction and rigidity of crate the same shall be checked for physical requirement and conformance to specification requirements as per IS : 3071. Each crate will be packed with 10 (Nos) of containers.

IDENTIFICATION AND MARKING

8.1 Complete instructions for indicating the ratio of mixing of two components shall be printed/stenciled in black ink using 5mm high characters/numericals on each container together with the following details :-

8.1.1 Nomenclature (such as Adhesive i.e Type 'A' or type 'B' or cross linking agent)

8.1.2 AT/SO Number and date.

8.1.3 Manufacturer's name or recognized trade mark if any.

8.1.4 Batch No./Srl No of consignment.

8.1.5 Date of Manufacture (letter size shall be 10mm high).

8.1.6 Expiry date (letter size shall be 10 mm high).

8.1.7 Direction/Caution if any for storage and use.

8.1.8 Net weight of the contents.

8.1.9 Gross weight of the container.

PACKAGING

9.1 In order to ensure that Adhesive and Cross Linking Agent reaches the consignee in perfect and serviceable condition & fit for use, proper packing is ensured. This is done as described below :-

9.1.1 The adhesives (first component) shall be supplied in 5 kg containers and cross linking agent (second component) in 1 kg sealed container, sealing shall be by means of double lid to ensure air tightness.

9.1.2 Eight such containers of adhesives each of 5 kg capacity and suitable numbers containers of cross linking agent each of 1 kg capacity shall be placed separately in corrugated paper box and then shall be packed in the respective crates.

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NOTE : When adhesives and cross linking agent are demanded for repair kit the same shall be supplied in 250 g and 50g respectively in cylindrical container having double lid to ensure hermatical sealing.

9.2 MARKING OF CRATES

9.2.0 Each crate shall be stenciled in black ink with 25mm high character/ numericals with following information:-

9.2.1 Description of content.

9.2.2 Qty and weight of each crate.

9.2.3 Firm's name/monogram

9.2.4 Consignee's address and other details.

10. GENERAL REQUIREMENT

10.1 Notwithstanding the requirements listed above the manufacturer shall ensure that adhesives, cross linking agent container and crates under supply fully conform to contract specification and other requirement in terms of manufacture, workmanship, finish and packaging.

11. WARRANTY/GUARANTEEE

11.1 The manufacturer shall render a warranty to the effect that the minimum self life of the adhesive components shall be not less than 6 months from the date of manufacture of stores. During the guarantee period in case the material found defective, then the purchaser shall be entitled to call upon the contractor to replace the defective stores, immediately within such a period as may be fixed by the purchase/inspection authority for this purpose. The store so replaced shall be deemed to bear warranty period as mentioned above from the date of replacement. If any other part of the stores are consumed, the contractor will also be liable to compensate the purchaser, inform of price reduction for the stores so consumed. Such price reduction being decided by the purchase officer.

12. QUALITY ASSURANCE INSPECTION

12.1 The Quality Assurance Authority for polychloroprene Adhesive being procured as per this specification shall be the Controller, CQAE, Vishwakarma Vihar, Aundh Camp, Pune -411 027. Depending upon the area in which the Contractor/manufacturer is located, the Senior Quality Assurance Officer/ Quality Assurance Office shall be indicated in the contract, for bulk inspection.

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ADVANCE SAMPLE

13.1 On concluding of supply order/acceptance of tender, firm shall submit 5 kg adhesive, type 'A' or 'B' and cross linking agent 1 kg (in well packed condition) as per SO/AT alongwith crate for above, to Controller CQAE, Aundh Camp, Pune -411 027. It must be duly drawn by SQAQ, SQAE(E) of the concerned area or his authorised representative. The sample shall conform the requirements as laid down in this specification.

13.2 Polychloroprene coated nylon fabric double texture KK-600 of size 1m x 1.3m conforming to the specification CQAE/9320/1372/(e) obtainable from the manufacturer registered with CQAE shall also be submitted along with advance sample.

13.3 Bulk production of stores shall be permitted only in case advance sample (s) are found conforming to this specification in all respects. The advance sample (s) are likely to be subjected to destructive test if required for testing for its performance.

BULK SUPPLIES INSPECTION (QUALITY ASSURANCE)

The bulk supply inspection shall be conducted in following stages.

14.1 PRE-INSPECTION REPORT OF MANUFACTURER :-

Before tendering the store for inspection to SQAQ/QAQ, the supplier will carry out thorough pre-inspection of each delivery to ensure that the stores conform to this specification in every respect. A certificate and detailed pre-inspection report including test reports for various tests as per para 3 & 4 of this specification shall be submitted by manufacturer while tendering bulk stores for inspection on the approved check sheet. If pre-inspection of bulk as required, has not been carried out by the manufacturer, the lot tendered is liable for rejection.

14.2 BULK PRODUCTION INSPECTION (QUALITY ASSURANCE)

Bulk quantity each of Adhesives and cross linking agent duly filled in containers alongwith proportionate Nos, crates shall be tendered separately for the purpose of tests as per test schedule No ENGR/TS/1089 attached to this specification by Inspection officer (i.e SQAQ/QAQ) or his authorised representative as indicated in the supply order/acceptance of tender at contractor's premises on clearance of advance sample by the Controller, CQAE, Aundh Camp, Pune -411 027.

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APPENDIX 'A' TO SPECN NO

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(refer para 4.1)

POT LIFE

15. At the start of the test, temperature of the adhesive and all the components shall be at $27 \pm 2^{\circ}\text{C}$, weight 200 g of the adhesive in a 400ml beaker and blend thoroughly with cross linking agent in accordance with instructions of manufacturer and maintain it at $27 \pm 2^{\circ}\text{C}$ through out the experiment. Record the time when blending has been completed and adhesive is ready for use. Keep the beaker covered through out the test to avoid undue evaporation of the solvents. After 10 minute interval has lapsed, place a glass rod (5 mm dia and long enough to handle conveniently) in the center touching the bottom of the beaker. Rotate the glass rod in this position with a spiral motion moving outwardly towards the wall of the beaker. Repeat the stirring at interval of 10 minutes. While taking out the rod, examine the adhesive for gelling. Record the time from the start as soon as gelling is observed to set in.

APPENDIX 'B' TO SPECN NO

IND/ENG/PROV/1193/d

(refer para 4.2)

DETERMINATION OF COVERAGE

15.1 Weigh an appropriate quantity of the adhesive mixed with the recommended resin of cross linking agent in a beaker together with a suitable brush (w1). The adhesive shall then be applied by brushing to a polychloroprene coated nylon fabric of one sq metre in area roughened and prepared in the usual manner, in a uniform normal coat commensurate with satisfactory coverage and bonding strength. The balance of the material along with the brush shall then be weighed (w2).

The coverage shall be calculated as follows from the above data, i.e. average of two determinations :-

Coverage - $\frac{1000}{(W1 - W2)}$ sq m/ kg

Where W1 - Weight of adhesive + beaker & Brush (Initial) in grams

W2 - Weight of the remaining adhesive + beaker & brush (after application) In gram.

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APPENDIX 'C' TO SPECN NC

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(refer para 4.4)

5.2 METHOD FOR DETERMINATION OF BONDING STRENGTH OF ADHESIVE

1. The required number of strips in 5cm x 20cm size shall cut from double texture polychloroprene coated nylon fabric (KK-600 obtainable from the CQAE registered suppliers on demand) such that, the length of the strips are along the warp direction of the fabric. The strips shall be roughened to the extent of 6mm from one end on one side and the roughened portion cleaned with tolule. A marking pencil line shall be drawn on the roughened surface 50mm away from the edge and solvent allowed to evaporate.
2. A requisite quantity of the adhesive shall be prepared by thoroughly mixing the proportionate quantity of the cross linking agent recommended by the supplier.
3. The adhesive thus prepared shall be uniformly applied on the roughened surface of two strips more or less simultaneously. The two strips shall be joined to the extent of the 50mm mark after 15 minutes or 45 minutes of application of the adhesive as required so as to get a 5cm bond with the free ends on either side of the bond. The bonded portion shall then be pressed mechanically or manually to ensure proper adhesion.
4. After a period of 48 hours of natural curing, the specimen prepared as per para 3 above shall be tested for bond strength on a tensile testing machine of suitable capacity having a constant rate of traverse of 30 cm per minute.
- i. The bond strength shall be expressed as an average of five determinations. The lowest reading of any of the five determinations shall be not less than 450 kaf.

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**QUALITY ASSURANCE ACCEPTANCE PROCESS AND TEST SCHEDULE FOR
BULK INSPECTION OF ADHESIVE**

GENERAL

- 1.1 This quality assurance acceptance process and test schedule lays down the quality assurance acceptance checks, test and performance requirement of polychloroprene adhesive.
- 1.2 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 assurance requirements are met with strictly as per the terms of contract and supplies are upto the requirement of the contract specification, contract agreement and advance sample sentencing report.
- 1.3 During the application of the schedule, if it is found that further aspects which should advantageously be included in this schedule, such aspects should be brought to the notice of Controller CQAE, Vishwakarma Vihar, Aundh Camp Pune - 411 027.
- 1.4 For proper conduct of checks/tests, it is necessary that all the relevant standards, specifications are studied properly. Tests/recording procedure and computation of tests results are properly understood. A detailed quality assurance check sheet for various checks and tests and their systematic recordings shall be prepared by the manufacturer and got approved before its use. The pre-inspection report to be submitted by the firm, alongwith each inspection call letter during bulk supply, shall be on these format.
- 1.5 The manufacturer of Polychloroprene Adhesive shall extend to the Inspection Authority, i.e Controller, CQAE Aundh Camp, Pune-27 or his authorized representative i.e. (SQA/QAO) and inspecting staff, free of cost all assistance including the reasonable test facilities, like laboratory for testing of chemical composition, tack drypot life test, consistency test, transparency test and O.G. colour test, etc.
- 1.6 The manufacturer shall produce on demand or shall arrange all measuring instruments, labourer requirement if any for handling of Polychloroprene Adhesive. He shall arrange proper lighting and ventilation arrangement at inspection bay so as to give reasonably comfortable working condition to the quality assurance officer/staff for checks/tests.

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SAMPLING

SCALE OF SAMPLING

2.1.1 In a single consignment, all the containers of the same size (filled with adhesives & cross linking agent respectively) and drawn from the same batch of manufacture shall constitute a lot. If a consignment is known to consist of different batch of manufacture, then the containers belonging to the same batch shall be grouped together and each group shall constitute a separate lot.

2.1.2 Sample (s) of adhesives & cross linking agent alongwith containers & crates shall be tested/inspected from each lot for ascertaining their conformity to various requirements of the specification No IND/ENG/PROV/1193/d.

2.1.3 The sample (s) of adhesives and cross linking agents (duly filled in containers) shall be drawn at random without regard to their quality as described in IS : 4905. The sample (s) of adhesive containers and cross linking agent containers shall be serially numbered and clearly marked for their easy identification at later date. The number of adhesives and cross linking agents sample (s). to be drawn from respective lot shall be as given below :-

<u>Lot size</u>	<u>No of containers and crates to be selected</u>
Up to 50	3
51 to 100	5
101 to 300	8
300 & above	13

2.1.4 The sample (s) of containers offered shall also be the same as in the case of Adhesives shown in clause 2.1.3. These sample container shall be drawn duly filled in adhesive and cross linking agent.

CLASSIFICATION OF DEFECTS/PARAMETERS :-

Importance of the Adhesives, Cross Linking Agents, containers & crate and requirements are classified into the following :-

CRITICAL DEFECTS/PARAMETERS

3.1.1 Non conformance of Adhesives, like its POT LIFE CONSISTANCY COVERAGE/SPREADING, TACK DRY STATE AND TACK RANGE, BOND

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3.1.2 Non conformance of cross linking agents to clause 3.2.2 of specification No IND/ENG/PROV/1193/d.

3.2 MAJOR DEFECTS/PARAMETERS

3.2.1 Non conformance of Adhesive, like its TRANSPERANCY.

3.2.2 Non conformance of containers, like construction, performance test, non marking of individual adhesives & cross linking agent, containers as per clause 4.4, 4.7 & clause 8 of specification No IND/ENG/PROV/ 1193/d and tests.

3.2.3 Non conformance of crate, in performance tests as per para 4.8, 5.3, & 7.3 of the specification No IND/ENG/PROV/1193/d

3.3 MINOR DEFECTS/PARAMETERS

3.3.1 Non conformance of marking on crates as per clause 9.2^{of} this specification No IND/ENG/PROV/1193/d.

Note :- 1) For the purpose of sentencing of material Adhesives for their conformance to various chemical mechanical properties, other requirements of specification and performance/test requirements stated in the specification shall be based on relevant calculation as described in IS : 2500 (part I) adopting inspection level I & AQL :1.0 for the critical parameters, 1.5 for the major parameters.

2) For the purpose of sentencing of containers for its conformance of constructional requirements of specification /tests shall be based on relevant calculation as described in IS : 2500 (Part-I) and adopting level I, AQL : 2.5 for the major defect and level 6.5 for minor defect.

3) For the purpose of sentencing of crates (sample drawn as per clause 2.1.3 above) for its conformance to constructional requirement/tests (major parameter) as per specification requirements, none of the sample should fail to meet requirements.

4. QUALITY ASSURANCE CHECKS, TESTS AND INSPECTION

4.1 Following specification standards and documents shall be referred for guidance and further details :-

4.1.1 Specification No IND/ENG/PROV/1193/d.

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4.1.2 Advance sample report relevant to Polychloroprene Adhesive under inspection if any (to be supplied separately after advance sample inspection).

4.1.3 Approved advance sample of polychloroprene adhesive (if any)

4.1.4 IS : 4905 method of Random sampling.

4.1.5 IS : 2500 (part I) : sampling inspection tables, inspection by attributes by count of defects.

EXAMINATION OF MANUFACTURER'S PRE INSPECTION REPORT

The manufacturer of adhesive alongwith inspection call letter shall produce a knowing quantity of adhesive offered in container, duly packed in crate along with his pre-inspection and test report containing technical requirements indicated in clause 4 of the specification No IND/ENG/PROV/1193/d. However, the lid of crate shall not be nailed.

INITIAL VISUAL EXAMINATION

In case the firm's inspection call letter is found acceptable before proceeding to the detailed inspection, initial visual inspection of initial lot offered shall be carried out. This will include counting of total quantity offered, general condition, of containers, identification of marking on the containers & crates. In case discrepancies are found in the lot offered, further inspection shall be discontinued.

TESTS FOR WEIGHMENT OF CONTAINERS, DROP TESTS OF CONTAINER POT LIFE, COVERAGE, TACK BOND STRENGTH, CONSISTENCY, TRANSPARENCY AND CONFORMITY TO OG SHADE OF ADHESIVES

7.1 To ensure requisite quantity of adhesive in the containers, weight of the Adhesive containers shall be carried out. If found meeting this requirements, drop test of containers as described in clause 7.2 of the specification shall be performed.

7.2 In case the adhesive containers pass above tests the Polychloroprene Adhesives offered by the manufacturer for each lot shall be tested for various test requirement, as per clause 4.1 to 4.8 of the specification. The test sample shall be drawn immediately after tendering of adhesives as per the procedure given below :-

7.2.1 To ensure the sample taken from each container (selected for sample) is representative of the contents, the content shall be mixed thoroughly by shaking or by stirring or both. After the contents are thoroughly mixed, a small representative portion of the Adhesives

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shall be taken with the help of suitable sampling ladle from each of containers selected. The total quantity of the adhesive drawn from each container shall be sufficient to conduct "minimum of three" tests for each test requirement as described at clause 4.1 to 4.8 of the specification. Sufficient adhesives taken from each container shall also be kept sealed in air tight container and labeled with full identification particulars as a referred sample for further testing, in case if any dispute arise between the supplier and Inspection Officer. Till such time the test results are available the complete lot of adhesive offered for inspection shall be bonded and kept under properly sealed and locked condition in a bond room. Above sample containers also shall be checked as per clause 7.2 of the specification.

8. **FINAL INSPECTION OF ADHESIVES INCLUDING CONTAINERS, CRATES AND IDENTIFICATION MARKING**

8.1 In case adhesive sample (s) and other item like containers, qualify in the tests prescribed above before proceeding with further inspection, the bonded seal of bulk adhesive offered for inspection shall be examined and its condition checked. In case of any evidence of tampering, the lot shall be sentenced as "Rejected" and Rejection Inspection/Note/letter issued indicating the reason for rejection. In case no discrepancy observed, proceed with further inspection as detailed below :-

8.1.1 **TESTING OF CRATES** : Carry out the drop test of crates when packed with containers. Check other specification requirements of crates as per clause 4.8 of the specification. Minor rectification can be permitted.

8.1.2 **IDENTIFICATION MARKING** : Check identification marking of each containers and crates for its conformity in accordance with clause 8 and 9.2 respectively of the specification.

8.2 In case adhesive, container and crate sample (s) fail to qualify in the requirements, the lot shall be rejected and action taken as described above. The rejected stores may be segregated and kept under bonded condition till the supply completed.

9. **FINAL STAMPING AND RELEASE OF ADHESIVES FOR DESPATCH**

The entire lot is also subjected to second and third tier inspection by the Inspection Officer before issue of Inspection Note.

9.1 In case the Adhesive, containers and crates qualify in all the above tests/checks "Acceptance Inspection Mark" shall be affixed with paint

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(inlegible ink) on the upper and bottom face of containers. It should be prominent and should be easily recognisable even after a period of time.

9.2 Adhesive containers/first compound and second compound, each shall be got packed in respective wood crates as per packing instruction described in the specification No IND/ENG/PROV/1193/d and checked for its adequaty, quantity of containers that can be packed. The content of packing note shall also be checked for its completeness.

RECORD OF QUALITY ASSURANCE INSPECTION

10.1 While issuing Acceptance Inspection Note, under remarks column, total number of containers, the packaging details, its content, weight, location and manner in which adhesives containers and crates are stamped with acceptance inspection mark shall be indicated.

10.2 A complete test report of adhesive and quality assurance inspection details/observation including second/third tier inspection shall be systematically recorded and maintained on the check sheets serially numbered and authenticated by signature of inspection staff/officers.