SCAN

3754-ME
dt. 12-12-02

DCI 2822-ME
27.XII.91

Certified Correct Copy of
Approved/Unsealed/Drawing/Specification
date 5/3/92
for C. I. M. E. Kirkee

IND/ME/796
(PROV)

IND/MB/796:2014

DC-5344-MC dated 11/05/2015

ADHESIVE POLYSTER RESIN

(D.S. CAT NO.)

CONTROLLERATE OF QUALITY ASSURANCE
(MILITARY EXPLOSIVES)
AUNDH ROAD KIRKEE PUNE - 411 003.

C O N T E N T S

THIS SPECIFICATION OR ANY PATTER, DRAWING OR ANY OTHER INFORMATION ISSUED IN CONNECTION THEREWITH MAY ONLY BE USED FOR A SPECIFIC ORDER PLACED BY THE COMPETENT AUTHORITY. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE WHATSOEVER WITHOUT THE EXPRESS WRITTEN SANCTION OF THE DIRECTOR GENERAL OF QUALITY ASSURANCE MINISTRY OF DEFENCE, NEW DELHI - 110 011.

0. FOREWORD

0.1. This specification has been prepared by the Controllerate of Quality Assurance (Military Explosives), Aundh Road, Kirkee Pune - 411 003.

0.2. The Quality Assurance Authority for the item mentioned in this specification is CQA(ME), Aundh Road, Kirkee Pune-411 003.

1. SCOPE

1.1. This specification is meant to govern manufacture, supply & Quality Assurance of Adhesive Polyester Resin.

1.2. This material is suitable for use as bonding material in mine Antipersonnel 1A Directional.

2. RELATED DOCUMENTS

2.1. The related documents mentioned at Clause 2.2. are those applicable at the date of publication of this document. It is Contractor's/manufacturer's responsibility to confirm their current applicability & to obtain from CQA(ME), Aundh Road, Kirkee Pune - 411 003 information concerning any change that may be necessary due to cancellation, replacement or supersession of any of these documents.

6.0. PREINSPECTION

6.1. Before tendering the store to the Quality Assurance Officer/Quality Assurance Authority for inspection, the Contractor shall carry out a thorough inspection of each delivery to satisfy himself that the store fully conforms to this specification & shall render a certificate to that effect to the Quality Assurance Authority/Quality Assurance Officer.

7.0. QUALITY ASSURANCE

7.1. The resin, accelerator & catalyst & the packages in which they are packed shall be subject to inspection by & to the approval of Quality Assurance Officer/Quality Assurance Authority.

7.1.1. Samples of the materials & of the packages may be taken from any portion of the batch/lot/consignment.

7.1.2. If on examination any sample is found not conforming to this specification the whole batch/lot/ consignment stands rejected.

7.1.3. The foregoing provisions shall equally apply to the prime Contractors & Sub Contractors, if any.

7.2. TEST REQUIREMENTS

7.2.1. The sample of the adhesive made after mixing the resin, accelerator & catalyst in a specified proportion shall conform to the clause 3 above & in addition shall conform to the following test requirements.

2.2. Copies of this specification & other related specifications are obtainable on payment basis as follows : -

IS 138	-	The Bureau of Indian Standards, Manak Bhavan, 9, B.S. Zafar Marg, NEW DELHI - 110 002.
IND/ME	-	The Controllerate of Quality Assurance (Military Explosives) Aundh Road, Kirkee Pune -411 003.

3.0. DESCRIPTION

3.1. The Polyester Resin shall be a clear, colourless to pale yellow liquid free from foreign matter & visible impurities & when mixed with accelerator & catalyst in a specified proportion shall comply with the requirements as given in clause 7.2.

4.0. TENDER SAMPLE

4.1. The Contractor shall submit a tender sample of 250 ml resin & required amount of accelerator & catalyst in duplicate free of all charges from the same batch/lot/ consignment. All the three components should be submitted separately. The mixing proportion of Resin, Accelerator & catalyst shall be declared by the Contractor.

5.0. MANUFACTURE

5.1. The resin, accelerator & catalyst shall be manufactured by a process which will produce the product on mixing in the specified proportion conforming to the requirements of this specification.

.....6.....

7.2.2. SAMPLING

7.2.2.1. A representative sample of 250 ml of polyester resin shall be drawn from each container selected from the batch/lot/consignment. The number of samples to be drawn from the batch/lot/consignment shall be as follows :-

No. of Containers	NO. OF SAMPLES TO BE DRAWN
2 to 15	2
16 to 25	3
26 to 100	5
101 to 150	8
151 & above	13

The required quantites of accelerator & catalyst will be taken in separate containers.

8. WARRANTY

8.1. The store supplied against the contract shall deem to have been warranted against defective material & performance by the contractor/manufacturer for a period of 6 months form the date of receipt of the store at the consignee's end. If during this period any of the store is found defective, the same shall be replaced by the contractor/manufacturer free of charge at the consignee's premises.

9. PACKING

9.1. The materials Resin, accelerator & catalyst shall be packed separately in polythene bottles of suitable capacity & then packed in wooden box.

10. MARKING

10.1. All the packages containing the material shall be legibly & durably marked with the following details.

SL.NO.	CHARACTERISTIC	PASSING STANDARD	TEST METHOD
1.	Pot life in minutes min.	As agreed to between the purchaser & the supplier.	Appx 'A'
2.	Bond Strength in Kg/cm^2 min	150	Appx'B'
3.	pH of Water extract		
	Min	5	Appx 'C'
	Max	8	
4.	Water soluble Chlorides as NaCl % Max	0.15	Appx 'C'
5.	Water soluble sulphates as Na_2SO_4 % Max	0.2.	Appx 'C'
6.	Compatibility with Explosives	To be compatible when used in contact with explosives.	Method to be obtained from CCI(ME), KIRKEE.

i) Nomenclature & Specification number.

ii) Name & address of the consignee.

iii) A/T, S.O. No. & Date.

iv) Consignment Number.

v) Lot/Batch number & date of manufacture.

vi) Gross & Net mass.

vii) Consecutive number of package & total number of packages in the consignment.

viii) Date of supply .

ix) Contractor's initials or recognised trade mark.

10.2 In addition to above the Quality Assurance Authority/ Quality Assurance Officer may suggest some more marking/ identification considered suitable at the time of inspection.

11. DEFENCE STORES CATALOGUE NUMBER

11.1. The defence stores catalogue number allotted to this store is _____.

12. SUGGESTIONS FOR IMPROVEMENT

12.1. Any suggestion for improvement in this particular document may be forwarded to The Controller, CQA(ME), Aundh Road, KIRKEE PUNE - 411 003.

(Dr.S.S.RATHI)
CONTROLLER,
CQA(ME), KIRKEE.

APPENDIX 'A'

DETERMINATION OF POT LIFE

Take 100 ml of resin in a 150 ml beaker & add accelerator first & then catalyst in the required proportions. Stir the mixture with glass rod & note the time lapse between the moment the adhesive is ready for use & the time when it is no longer usable. (i.e. sets hard)

APPENDIX 'B'

DETERMINATION OF BON STRENGTH

Take about 100 ml of resin in a 150 ml beaker, & add accelerator & catalyst in the proportion prescribed by the contractor. Stir the mixture with glass rod. When it just starts gelling, apply a thin layer of it over an area of 25 mm^2 on two tin/M.S. strips of size 150 mm X 150 mm X 0.025 mm thick. Avoid air bubbles. Press over lap joint together. Allow the joint to remain under a dead load of 10 Kg for 24 hours. Remove the load & test the joint for shear strength in a tensile testing machine with a rate of traverse 450 mm/minutes, the clamps being 180 mm apart & the joint being in middle. The joint , shall not get detached or slipped. Note the load in Kg/cm^2.

APPENDIX 'C'

a) Preparation of Adhesive

Take 100 ml of resin in a aluminium dish & add accelerator & catalyst in a proportion prescribed by the contractor. Stir with glass rod & allow it to set hard.

(i) Preparation of Water Extract

15 g of finely powdered mass of the cured adhesive as prepared above is taken in a clear dry conical flask of 500 ml capacity. Add 250 ml of freshly boiled cooled distilled water.

..11....

Shake well & allow to remain for 2 hours with occasional stirring. Filter through whatman filter paper No.41. Collect the aqueous extract in a 250 ml standard flask & make up the volume.

(ii) DETERMINATION OF pH

Transfer about 50 ml of the aqueous extract from (i) above in a clean, dry glass beaker & determine the pH on a standard pH meter.

(iii) DETERMINATION OF WATER SOLUBLE CHLORIDE

Take 100 ml of aqueous extract from (i) above ina a clean dry 250 ml conical flask. Add 20 ml of concentrated nitric acid & 10 ml of 0.1 N silver nitrate solution. If a significant opalascenee due to precipitation of silver chloride is bbtained, shake well till the silver chloride is coagulated. Titrate against 0.1 N Ammonium thiocyanate solution using 5 ml of Ferric allum as indicator till a reddish pink colouration is observed. Note the reading on the burette (T_1), carry out blank under similar conditions. (T2).

Water soluble Chlorides as Nacl% =

$$\frac{(T_2 - T_1) \times f \times 0.00585 \times 250}{\text{Mass of the sample} \times 100} \times 100$$

WHERE

f = Factor of 0.1 N Ammonium thiocyanate solution.

....12....

(iv) DETERMINATION OF WATER SOLUBLE SULPHATES

Transfer 100 ml of aqueous extract from (i) above into a clean dry 250 ml beaker. Acidify with 10 ml of concentrated hydrochloric acid. Boil & add 5 ml of 10% Barium Chloride solution. Boil further for 2 to 3 minutes. Keep overnight. Then filter through a clean, dry & previously weighed (M) silica gooch crusible. Wash the contents with warm distilled water till free from chlorides. (as tested by adding conc. HNO_3 & $AgNO_3$ solution). Dry the crucible in an oven maintained at 100 $\pm$ 5°C for 4 hours. Remove & ignite. Then keep in a muffle furnace at 700 to 800°C for 1/2 hour. Remove, cool & weigh (M1).

Water soluble sulphates as Na_2SO_4 % =

$$\frac{(M_1 - M)}{\text{Mass of Sample}} \times \frac{142}{233.4} \times \frac{250}{100} \times 100$$

Run a blank at the same time & apply the necessary correction.

- - - ----------