

LIST OF MEMBERS ASSOCIATED WITH FORMULATION OF THIS STANDARD

1. The reaffirmation of this Joint Services Specification 8040-12 has been approved by Shri RS Gauba, Sec 'G', Associate Director, PO-II, DRDO, Chairman, Armament Standardisation Sub-committee by circulation.
2. The representatives of following organisations have been present/consulted in approving the document:

S. No.	Organisation
1	Programme Office-II, DRDO Orgn, New Delhi
2	ADGWE/GS (WE-2/3), New Delhi
3	Dir of Arty (GS/Artillery-5), New Delhi
4	Dir Gen of Naval Armt, Naval HQ, New Delhi
5	Dir of Armt & Safety Eqpt, Air HQ, New Delhi
6	DGEME, Army HQ, New Delhi
7	DGNAL, Naval HQ, New Delhi
8	DGAQA, JD (Armt) Gp, New Delhi
9	COA (ME), Pune
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11	COA (SA), Ichapur, West Bengal
12	COA (W), Jabalpur
13	HEMRL, DRDO, Pune
14	ARDF/DRDO Orgn, Pune
15	Ammunition Factory, Pune
16	Secretary ASSC



भारत सरकार
GOVERNMENT OF INDIA
रक्षा मंत्रालय
MINISTRY OF DEFENCE

संयुक्त सेवा विनिर्देश
JOINT SERVICES SPECIFICATION
ON

ADHESIVE RUBBER ROSIN XN (APC NO. 6) &
ADHESIVE RUBBER ROSIN XP (APC NO. 6a)
DCAN 8040-000 007
NSN No. 8040720198269

मानकीकरण विदेशालय
रक्षा उत्पादन विभाग
रक्षा मंत्रालय

एच-ब्लॉक, निर्माण भवन डाकघर
नई दिल्ली-११० ०११

DIRECTORATE OF STANDARDISATION
DEPARTMENT OF DEFENCE PRODUCTION
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RECORD OF AMENDMENTS

Amendment No.	Date	Amendment pertains to S. No./Para No./ Column No.	Authority	Amended by Name & Appointment (In block letters)	Signature & Date

2.2 (ii)

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0.7 Indian Standard (IS) specifications are available free of cost for registered users on:

Directorate of Standardisation Website:
www.dspdos.gov.in
For registration visit our website.

0.8 This specification holds good only for the supply order for which it is issued

0.9 **Directorate of Standardisation Website** - All the approved JSSs/ISGs are available on the Directorate of Standardisation Website www.dspdos.gov.in. Defence Organisations desirous of accessing a copy of this document are requested to approach the Directorate of Standardisation for obtaining user id/password to access the website.

0. FOREWORD

0.1 This specification has been prepared by Armament Standardisation Sub Committee on the authority of the Standardisation Committee, Ministry of Defence.

0.2 This specification has been approved by the Ministry of Defence and is mandatory for use by the Defence Services.

0.3 The JSS 8040-12 : 2012 (Third Revision) Reaffirmed 2017:

a) was prepared in the year 1993

b) was revised in the year 2000, 2005 & 2012 and reaffirmed the same

0.4 This specification is meant to govern Manufacture, Supply and Quality Assurance of Adhesive Rubber Rosin XN (APC No. 6) & XP (APC No. 6a)

0.5 Quality Assurance Authority for the item covered in the JSS is the Controller, Directorate of Quality Assurance (Military Explosives), Aundh Road, Pune-411 020. Enquiries regarding technical parameters shall be addressed to the Quality Assurance Authority, while other enquiries shall be referred to:

The Director,
Directorate of Standardisation,
Ministry of Defence,
'H' Block, Nirman Bhawan PO,
New Delhi-110 011

0.6 Non-registered users can obtain the following on payment:

a) **Copies of IS from:**

Bureau of Indian Standards,
Manak Bhawan,
9, Bahadur Shah Zafar Marg,
New Delhi-110 002.

or

their Regional/Branch offices.

b) **Copies of JSSs/ISGs from:**

The Director,
Directorate of Standardisation,
Standardisation Documents Centre,
Ministry of Defence,
Room No. 05, 'J' Block,
Nirman Bhawan PO,
New Delhi-110 011.

(APC No. 6a) shall consist of rubber compounded with Rosin fillers and reinforcing materials dispersed in petroleum solvent. It shall be in the form of a viscous liquid of brushing consistency, free from lumps, grit and visible impurities.

4. MANUFACTURE

4.1 Adhesive Rubber XN (APC No. 6) & XP (APC No. 6a) shall be manufactured by a process which shall produce the product conforming to this specification.

4.2 Adhesive Rubber Rosin XN (APC No. 6) & XP (APC No. 6a) shall be manufactured from the following ingredients, conforming to their respective specification and in the proportions shown below.

S. No.	Ingredient	Specification	Proportion (Parts by Mass)
a)	Adhesive Rubber Rosin XN		
	1)	Rosin Grade I	JSS 6810-62
	2)	Trichloroethylene	IS 245
	3)	Reclaimed Rubber	IS 7490
b)	Adhesive Rubber Rosin XP		
	1)	Rosin Grade I	JSS 6810-62
	2)	Petroleum Solvents	Petroleum fraction boiling between 65°C and 115°C
	3)	Reclaimed Rubber	IS 7490
4)	Fillers	-	Remainder

4.3 The Rubber shall be milled well and mixed with Trichloroethylene (for Adhesive Rubber Rosin XN) or Petroleum solvent (for Adhesive Rubber Rosin XP). Ground Rosin shall be added with constant stirring until a viscous liquid of brushing consistency is formed.

5. TENDER SAMPLE

The manufacturer/supplier/contractor shall submit two tender samples each of 500 g essentially from the same batch/lot of manufacture free of all charges and conforming to this specification to the Quality Assurance Authority/Quality Assurance Officer as stated in the contract.

6. PRE-INSPECTION OF STORES

6.1 Manufacturers/Contractors must satisfy themselves that the stores are in accordance with the terms of the contract and fully conform to the required specification, by carrying out a thorough pre-inspection of each lot before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract. A declaration by the contractor that a necessary pre-inspection has been carried out on the stores tendered will be submitted along with the challan. The declaration will also indicate the method followed in carrying out pre-inspection showing the features checked/visited and will have the test certificate attached to the challan/declaration.

1. SCOPE

1.1 Adhesive Rubber Rosin XN (APC No. 6) is suitable for use in water proofing and fixing of non-metal and metal components in contact with, or proximity to explosives other than propellants.

1.2 Adhesive Rubber Rosin XP (APC No. 6a) is suitable for use in water proofing and fixing of non-metal and metal components in contact with, or close proximity to explosives and propellants.

1.3 Both Adhesive Rubber Rosin XN (APC No. 6) and Adhesive Rubber Rosin XP (APC No. 6a) can be used as general purpose cements for securing metal and metal joints.

2. RELATED SPECIFICATIONS/DOCUMENTS

2.1 Reference is made in this specification to:

S. No.	Specification No. & Year	Nomenclature
a)	IS 138 : 1992 (Third Revision) AMD 1 Reaffirmed 2014	Ready Mixed Paint, Marking for Packages and Petrol Containers-Specification
b)	IS 245 : 1988 (Third Revision) AMD 2 Reaffirmed 2015	Specification for Trichloroethylene, Technical
c)	IS 1406 : 1995 (Fourth Revision) Reaffirmed 2011	Rectangular Tins for Liquids-Specification
d)	IS 7490 : 1997 (First Revision) Reaffirmed 2014	Reclaimed Rubber-Specification
e)	JSS 6810-62 : 2009 (Third Revision) Reaffirmed 2015	Rosin Grade-I Ammunition And Rosin Powdered Grade-II Ammunition
f)	INDTC/0107	Dosun White Bleached

2.2 Copies of IND/TC/Specifications are obtainable on payment from:

The Controller,
Controllerate of Quality Assurance (Textiles and Clothing),
Kampur (UP)

3. MATERIAL

Adhesive Rubber Rosin XN (APC No. 6) shall consist of rubber, compounded with Rosin, fillers and reinforcing materials dispersed in Trichloroethylene. Adhesive rubber Rosin XP

Table 1 Test Requirements (Concluded)

S. No.	Characteristics	Passing Standard	Test Method
j)	Total solids for XN variety only, % by mass	35.0 <i>Mfin</i> 45.0 <i>Mdex</i>	Appx 'K'
k)	Free sulphur, % by mass	0.05 <i>Mdex</i>	Appx 'L'

8. WARRANTY

The stores supplied against the specification shall be deemed to bear warranty for 12 months from the date of receipt of store at consignee's end and against defective design/material/workmanship/performance. If during this period any of the stores supplied is found defective, the same shall be rectified/replaced by the contractor, free of charge, at the user's premises within a period of three months from the date of intimation of defect.

9. PACKAGING

9.1 The composition shall be packed in tins conforming to IS 1406 and shall not exceed 5 kg. Four tins shall be packed in a wooden crate or box, secured enough to withstand road/rail transit hazards.

9.2 Any other form of packages shall have the prior approval of the Quality Assurance Officer/Quality Assurance Authority.

9.3 The inclusion of foreign matter or impurities in any of the packages shall render the whole batch/lot/consignment liable to rejection.

10. MARKING

10.1 All packages containing the material shall be indelibly and legibly marked with the following details:

- Nomenclature and Specification No. of the material
- Name and address of the Consignee
- *A/T or SO No. and Date
- *Consignment No
- Lot/Batch No. and Date of Manufacture
- Gross and net mass
- *Consecutive No. of package and total number of packages in the consignment.

6.2 If the quality Assurance Officer finds that the pre-inspection of the consignment as required above has not been carried out, the consignment is liable for rejection.

7. QUALITY ASSURANCE

7.1 Inspection

Adhesive Rubber Rosin XN (APC No. 6) & Adhesive Rubber Rosin XP (APC No. 6a) and the packages in which it is packed shall be subject to inspection by and to the approval of the Quality Assurance Officer/Quality Assurance Authority.

7.2 Sampling

Two representative samples each of 500 g shall be drawn from each batch/lot/consignment of supply/manufacture. However, the number of samples to be drawn shall be at the discretion of the Quality Assurance Officer/Quality Assurance Authority.

7.3 Criteria for Conformity

If on examination, any sample is found not to conform to this specification, the whole batch/lot/consignment may be rejected.

7.4 Test Requirements

Samples taken from any portion of the batch/lot/consignment of material shall conform with clauses 3 and 4 and in addition shall conform to the test requirements shown in the following table.

Table 1 Test Requirements

S. No.	Characteristics	Passing Standard	Test Method
a)	Filler, % by mass	35.0 <i>Mfin</i> 40.0 <i>Mdex</i>	Appx 'B'
b)	pH of aqueous extract of: 1) Composition as received 2) The dried film	5.5 <i>Mfin</i> 8.0 <i>Mdex</i>	Appx 'A', & 'C'
c)	Carbonates, calculated as Calcium carbonate, CaCO ₃ , % by mass	5.0 <i>Mdex</i>	Appx 'D'
d)	Sulphur and its compounds calculated as Sulphur, % by mass	1.0 <i>Mdex</i>	Appx 'E'
e)	Lead compounds, calculated as PbO, % by mass: 1) For XN variety 2) For XP variety	5.0 <i>Mdex</i> 0.03 <i>Mdex</i>	Appx 'F'
f)	Chlorides, calculated as Sodium chloride (NaCl), % by mass	0.1 <i>Mdex</i>	Appx 'G'
g)	Drying time	15 min <i>Mdex</i>	Appx 'H'
h)	Adhesive Strength	80 N <i>Mfin</i>	Appx 'J'

APPX 'A'
(Clause 7.4)

PREPARATION OF DRIED FILM

- A-1. Spread a film (approximately 3 mm thick) of the sample on a clean glass plate/polythene sheet of suitable thickness and maintain it at a temperature of 60°C to 65°C for 24 hours.
- A-2. Strip the film from the glass plate/polythene sheet of suitable thickness and cut it in small pieces. Such shredded dry film will be taken for the tests.

- h) *Date of Supply.
- j) Manufacturer's/Contractor's initial or recognized trademark.

* Not applicable when the store is manufactured in Ordnance Factories.

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

10.3 The paint used for marking should conform to IS 138 and to the satisfaction of the Quality Assurance Officer/Quality Assurance Authority.

11. DEFENCE CATALOGUE NUMBER/NATO STOCK NUMBER

Defence Catalogue Number allotted to this store is 8040-000 007.
NATO Stock Number allotted to this store is 8040-72019 8269.

12. SAFETY OF OPERATIONS

Nothing in this specification shall relieve the manufacturer/supplier/contractor/user of his responsibility for the safety of operations in manufacture, storage, transit or use of this store.

13. SUGGESTIONS FOR IMPROVEMENT

Any suggestion for improvement in this document may be forwarded to:

The Director,
Directorate of Standardisation,
Ministry of Defence,
'H' Block, Nirman bhawan PO,
New Delhi-110 011.

DETERMINATION OF pH

C-1. PREPARATION OF AQUEOUS EXTRACT

C-1.1 To 5 g of the composition add 100 ml of neutral distilled water freshly boiled and cooled and stir thoroughly for 15 minutes. Filter if necessary.

C-1.2 Reflux 10 g of the shredded dried film (see Appx 'A') with 100 ml distilled water for one hour. Cool and filter if necessary.

C-2. PROCEDURE

Determine the pH of the aqueous extract electronically/potentiometrically by using standard electrodes or by pH meter or by pH indicator paper, to as near matching as practicable.

DETERMINATION OF FILLERS

Weigh accurately about 1 g of the dry film into a 250 ml round bottomed flask. Add 50 ml of Nitrobenzene and reflux on a sand bath for one hour. Remove the condenser, cool to below 50°C and add 100 ml of Acetone. Cover and leave overnight. Filter through a tared Gooch crucible (M₁), wash well with Acetone. Dry at 100°C to 105°C and weigh to constant mass (M₂).

$$\text{Filler, \% by mass} = \frac{(M_2 - M_1)}{\text{Mass of sample taken}} \times 100$$

JTG/MISSA
DATE: 5/8/2020

JSS 8040-12 : 2012
(Third Revision)
Reaffirmed 2017

APPX 'E'
(Clause 7.4)

DETERMINATION OF SULPHUR AND ITS COMPOUNDS

Weighed accurately about 1 g of the shredded dry film in a 250 ml beaker. Add 5 ml Bromine and 25 ml Acetic acid, cover with a watch glass and warm gently on a warm water bath in a fume cupboard for 30 minutes. Leave overnight. Boil off excess Bromine. Add 50 ml hot water and acidify with dilute Hydrochloric acid. Boil for 5 minutes and add 10 ml of a 10% Gooch crucible (M₁), wash the precipitates well with hot water and dry the crucible at 100°C. Ignite at 900°C and weigh to constant mass (M₂). Run a blank as above without the sample.

Sulphur & its Compounds as S (on dry film), % by mass = $\frac{\text{Mass of BaSO}_4 \times 13.74}{\text{Mass of sample}}$

JSS 8040-12 : 2012
(Third Revision)
Reaffirmed 2017

APPX 'D'
(Clause 7.4)

DETERMINATION OF CARBONATES

Take a weighed quantity of the shredded dry film and find out the carbonate content from an estimation of the Carbon dioxide in carbonates, which is obtained by loss of mass of the material when treated with a known mass of acid. The Schöroeter or Mohr alkalimeter may be used for this determination.

DETERMINATION OF CHLORIDES

Weigh accurately about 5 g of the dry film in a 250 ml conical flask. Add 100 ml water and boil for 10 minutes. Decant off the extract through a No. 1 filter paper and repeat the extraction with a similar quantity of water. Combine the extracts and add 20 ml of dilute Nitric acid and 10 ml of N/20 Silver Nitrate solution. Boil and cool. Titrate slowly with constant stirring against standard N/20 Ammonium Thiocyanate (a) solution using 5 ml of a 10% Ferric alum solution in Nitric acid as the indicator. Carry out a blank without the sample (b).

$$\text{Chlorides as NaCl, \% by mass} = \frac{(b - a) \times 0.2923 \times f}{\text{mass of sample taken}}$$

where,

b = ml of N/20 NH_4CNS required for blank;

a = ml of N/20 NH_4CNS required for sample; and

f = Factor of standard N/20 NH_4CNS solution.

DETERMINATION OF LEAD COMPOUNDS

A weighed quantity of the material, which has been dried at 100°C, is shaken continuously for one hour at room temperature with 1000 times its mass of an aqueous solution of Hydrochloric acid, containing 0.25% by mass of Hydrogen Chloride. The solution after shaking is allowed to stand for one hour. Any dissolved Lead or Lead compounds is then precipitated as Lead Sulphide heated in air to convert it into Lead Sulphate and weighed as Lead Sulphate.

$$\text{Lead \& its Compounds as PbO, \% by mass} = \frac{\text{Mass of PbSO}_4 \times 73.60}{\text{Mass of sample}}$$

JSS 8040-12 : 2012
(Third Revision)
Reaffirmed 2017

APPX 'J'
(Clause 7.4)

DETERMINATION OF ADHESION/STRENGTH

J-1. APPARATUS

- a) A mild steel plate, 90 mm by 40 mm, and 15 mm thick.
- b) A strip of drossit white (bleached) conforming to specification IND/TC/0107, 200 mm Warp wise and 50 mm weft wise.
- c) A Tensile testing machine, the jaws shall be pulled apart at a constant rate of 115 to 127 mm per minute and calibrated to read in 0.25 kg.
- d) A hand roller 60 mm wide and having a mass of 2.5 kg.
- e) An air oven.

J-2. PROCEDURE

J-2.1 Burnish the test panel with No. 100 Emery cloth and clean it grease free with Trichloroethylene. Use a 12.5 mm brush and apply a thin uniform coat of the sample to the panel, leaving an end of 12.5 mm. Similarly coat the cloth with the sample 75 mm from one end. Allow drying for 30 minutes and applying a second coat to the fabric.

J-2.2 After three minutes superimpose the steel panel on the fabric leaving an overlap of 6 mm at each side of the panel. Roll the assembly immediately on the fabric side with the roller, using heavy pressure first transversely and then longitudinally four times in each direction) to ensure good contact. Let the assembly stand for three hours and then place in an oven at $50^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 16 hours. Remove from the oven and let stand for 5 hours at room temperature.

J-2.3 Fasten the panel to the movable jaw and clamp the fabric end to the fixed jaw folding it on itself if required. Record the load readings when the jaws are 12.7 mm, 25.4 mm, 38 mm and 50 mm apart.

J-2.4 Carry out the test on three assemblies and take the mean of the twelve readings as the adhesive strength of the joint.

J-2.5 Examine the bonded surfaces. The test shall be considered as passed by the sample if the total area exposed of the steel is less than 10% of the test surface and the exposed surface is small and discontinuous.

JSS 8040-12 : 2012
(Third Revision)
Reaffirmed 2017

APPX 'H'
(Clause 7.4)

DETERMINATION OF DRYING TIME

The composition is spread uniformly on a clean glass plate, to give a dry film mass of 0.2 g ± 0.02 g per square inch exposed (protected from direct sunlight) in a horizontal position till it is surface dry. The time required for surface drying is recorded.

APPX 'L'
(Clause 7.4)

DETERMINATION OF FREE SULPHUR

Take a weighed quantity of the shredded dry film (prepared as described in Appx 'A') and extract it with Acetone. The Acetone extract is evaporated to dryness and free Sulphur in this residue, is then oxidized to sulphate and estimated as Barium Sulphate as described in Appx 'E' above.

APPX 'K'
(Clause 7.4)

DETERMINATION OF TOTAL SOLIDS

Weigh accurately a petridish of 75 mm diameter (M_1). Pour about 10 ml of the sample into it, cover and weigh quickly (M_2). Keep the dish with the sample exposed in and oven at 60°C till the bulk of the volatile matter evaporates. Raise the temperature to 100°C and let it stand for three hours. Cool the dish in a desiccator and weigh (M_3).

$$\text{Total Solids, \% by mass} = \frac{(M_3 - M_1) \times 100}{M_2 - M_1}$$