IS 852 (1994): Animal Glue For General Wood-Working Purposes -Specification [CED 20: Wood and other Lignocellulosic products]

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भारतीय मानक

सामान्य लकड़ी-संबंधी कार्यों के लिए पशु ग्लू – विशिष्टि

(दूसरा पुनरीक्षण)

Indian Standard

ANIMAL GLUE FOR GENERAL WOOD-WORKING PURPOSES- SPECIFICATION

(*Second Revision*)

UDC 665'934 : 674

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

February 1994

Price Group 4

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Wood Products Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was first published in 1957 and subsequently revised in 1969. This second revision has been brought out to incorporate the modifications found necessary in the present day context.

The Composition of the technical committee responsible for the formulation of this standard is given at Annex G.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rule8 for Rounding off numerical values *(revised)*'. Thee number of place8 retained in the rounded off value should be the same as that of the specified valu in the standard.

Indian Standard

ANIMAL GLUE FOR GENERAL WOOD-WORKING PURPOSES — SPECIFICATION

(*Second Revision*)

1 SCOPE

This standard covers requirements of animal glue for general wood-working purposes.

2 MATERIAL

The glue shall be prepared from skin or bone material. It shall be supplied in the form of sheets, cakes, granules, pearls, flakes or powder, or in a kibbled form, as specified by the purchaser.

3 REQUIREMENTS

3.1 Final specimens for testing shall be prepared in accordance with Annex A from the samples selected as specified in 4.2 to 4.4. These final samples shall be subjected to the test specified in 3.3 to 3.8 for the requirements specified in the respective clauses.

3.2 **Odour**

The odour of a freshly prepared hot solutionof the glue shall not be objectionable.

3.3 **Keeping Quality**

When tested by the method described in Annex B the glue shall keep not less than six days without evidence of liquefaction, putrafaction or mould growth.

3.4 **Storage Properties**

The glue shall retain all the properties specified under 3.2 and 3.5 to 3.8 for at least 12 months from the date of manufacture, when stored in a cool dry place.

3.5 **Moisture Content**

3.51 The average moisture content of the glue, when determined by the method described in Annex C, shall be not greater than 14 percent and no individual value shall be greater than 18 percent.

3.5.2 Should the average moisture content be more than 14 percent (not to exceed 18 percent under any circumstances), the supplier shall make good the deficiency in the mass delivered in the manner stated below:

The mass of the material delivered (as weighed on delivery) shall be equal to:

$$N \frac{86}{100 - M}$$

where

N = nominal mass of the consignment ordered, and

M = average percentage moisture content.

3.6 **Chloride**

The chloride content shall not exceed 2 percent calculated as sodium chloride, when determined by the method described in Annex D.

3.7 **Acidity and Aikalinity (*p*H)**

The *p*H value of the glue, when determined by the method described in Annex E shall be not lower than 4.0 and nor higher than 8.2.

3.8 **Overlap Joint Strength in Longitudinal Shear**

The average failing load of six test specimens, prepared and tested by the method described in Annex F shall be not less than 275 kg.

4 SAMPLING

4.1 Representative samples of the animal glues shall be selected in the manner specified in 4.2 to 4.4.

4.2 Sheet and Cake Glue

A number of containers shall be selected for sampling fromvarious parts of the consignment in such a manner that complete representation is assured.

The number of containers to be sampled shall be in accordance with Table 1.

Table 1 Sampling of Sheet and Cake Glue

No. of Containers in the Consignment	No. of Containers to be Sampled
1 to 5	1
6 to 50	5
51 to 100	10
101 to 500	15
501 to 1000	20

4.2.1 In the case of containers of not less than 50 kg of glue, the weight of sample drawn shall be not less than 1 kg where there is only one container, and not less than 0.5 kg from each container in other instances; in the case of containers of less than 50 kg of glue, the amount taken shall be proportional.

4.2.1.1 Each sample increment shall consist of the whole or equal proportions of not less than four sheets of cakes, which shall be representative of the contents of the container.

4.3 Powdered, Pearl, Cube or Granulated Glue

Glue in these form shall be sampled in the same proportions as prescribed for sheet and cake glues. Each increment shall be taken by means of a sampling tube scoop, or similar tool, to ensure glue being taken from the top, middle and bottom of the container.

4.4 Flake and Kibbled Glues

Glues in these forms shall be sampled in the same proportions as prescribed for sheet and cake glues, the 0.5 kg proportions taken from each container being as representative as possible.

5 INSTRUCTIONS FOR USE

The manufacturer shall state in his instructions the method of preparing the glue for use.

6 PACKING

Unless otherwise specified, the glue shall be packed in suitable quantities as agreed to between the purchaser and the supplier in gunny bags with alkathene liner.

7 MARKING

7.1 Bach bag of animal glue shall be legibly and indelibly marked with the following information:

a) Indication of the source of manufacture,

b) Description of the material,

c) Year of manufacture, and

d) Batch number.

7.2 BIS **Certification Marking**

Bach bag may also be marked with the Standard Mark.

7.21 The use of the Standard Mark is governed by the provisions of Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

ANNEX A

(*Clauses* 3.1, **B-l.l,D-l.l,E-1.1** *and* F-2.1)

PREPARATION OF GLUE SPECIMEN

A-l GENERAL

A-l.1 All samples drawn as specified in 4.2 to 4.4 shall be placed in clean, dry, air-tight non-absorbent containers, where they shall remain until the final samples are taken.

A-1.1.1 One or more specimens, each weighing not less than one kilogram shall then be taken in the manner specified in A-l.2 or A-1.3, as the case may be and placed in clean, dry, air-tight, non-absorbent containers.

A-l.2 **Sheet and Cake Glue**

A representative piece shall be broken from each sheet or cake. These pieces shall be further broken up and reduced by mixing and quartering.

A-l.3 Pearl, Cube, Powdered, Granulated, Flake and Kibbled Glues

The material shall be thoroughly mixed and the specimen taken from the bulk.

A-2 PREPARATION OF GLUE SPECIMEN

A-2.1 Dry Glue

The specimen shall be reduced to a mass of about one kilogram and ground down to a grist of approximately 3 mm by hand in an iron mortar (or alternatively in a laboratory disintegrator, the type of which shall be agreed to between the manufacturer and the purchaser). This specimen shall then be quartered to bring the final weight to 0.5 kg, care being taken that a representative amount of all grists is included in the quartering. The powdered specimen so obtained shall be kept in an air-tight container.

A-2.1.1 ln view of possible loss of moisture in grinding, it is preferable to take a separate specimen for the moisture content test from the quantity obtained by the preliminary breaking up, before putting through the disintegrator. This separate specimen may then be powdered by hand in a pestle and mortar, or cut with scissors, and is suitable for the moisture content test.

ANNEX B

(Clause 3.3)

DETERMINATION OF KEEPING QUALITIES

B-l METHOD

B-l.1 Soak 5 g of the powdered specimen (see Annex A) in 20 ml of cold, distilled water until completely swollen. Then heat on a water bath until dissolution is complete, and transfer to a petri dish (94 mm dia). Cover the petri dish and place it in an incubator maintained at temperature of 40°C. Take the petri dish out of the incubator after each 24 hours and allow to cool before inspection. During inspection, remove the lids.

B-l.2 Note the time in days for liquefaction, putrefaction or moulds to occur.

ANNEX C
(Clause 3.5.1)

DETERMINATION OF MOISTURE CONTENT

C-l DEFINITION

For the purpose of this standard, the moisture content shall be the percentage loss in mass of the specimen when a thin and evenly distributed film of glue is dried at 105°C to constant mass.

C-2 PROCEDURE

C-2.1 Break up the glue in an iron mortar, and pass sufficient quantity through 2.00 mm IS Sieve. Weigh one gram of this powder into a tared, flat bottomed stainless steel dish (70 mm dia, 15 mm high, mass not less than 20 g), preferably fitted with a cover to **be used** during cooling and weighing. Add 10 ml of distilled water and allow the glue to soak. Then place the dish on a water bath so that the glue is dissolved and a homogeneous solution obtained and leave it until most of the water has evaporated. Transfer the dish to an oven maintained at a temperature of 103 ± 2°C and allow to remain for two hours, during which time the oven door shall not be opened. An electrically heated oven with thermostatic control is suitable for this test. The thermometer bulb shall be placed 12 mm above the centre of the dish, and the 105°C mark shall be approximately 50 mm above the outside top of the oven. Remove the dish from the oven, cool in a desiccator and weigh the dish. Replace the dish in the oven, and allow it to remain there for further half an hour, after which again cool and weigh; if the mass is constant to one milligram, the glue shall be considered dry.

C-3 CALCULATION

The loss in mass multiplied by 100 shall be regarded as the moisture content of the sample.

NOTE-Every precaution shall be taken to prevent access of moisture to the dried film both before and during weighing.

ANNEX D
(*Clause* 3.6)

DETERMINATION OF CHLORIDES

D-l. PROCEDURE

D-l.1 Weigh 5 g of the powdered specimen (see Annex A) into a nickel or platinum basin. Add 10 ml of cold, distilled water. Allow to soak for one hour. Heat on a water bath until dissolved, and add 5 g of pure lime. Dry on a steam bath and ignite so that all organic matter is completely destroyed. Extract the residue by boiling rapidly with small quantities of distilled water. Transfer to a glass container and neutralize with acetic acid (indicator paper may be used). Make up the volume to between 50 ml and 100 ml with distilled water. Add 1 ml of potassium chromate indicator (5 percent solution of potassium chromate in distilled water). Titrate slowly with 0.1 N silver nitrate solution until first permanent colour deviation from the pure yellow of the suspension is obtained.

D-2 CALCULATION

D-2.1 One milligramofO.l Nsilver nitrate solution is equivalent to 0.005 85 g of sodium chloride.

ANNEX E
(*Clause* 3.7)

DETERMINATION OF ACIDITY AND ALKALINITY (*p*H)

E-l METHOD

E-l.1 Dissolve one gram of the powdered specimen (see Annex A) in a small quantity of warm, recently boiled, distilled water in a stoppered flask of chemically-resistant glass and make up the volume to 100 ml with recently boiled and cooled, distilled water. After shaking and allowing to cool to ordinary temperature, determine the *p*H value of the solution by actual measurement of the potential by a recognized method, for example, the glass electrode. Care shall be taken throughout the operation to avoid absorption of carbon dioxide from the air.

E-l.2 For approximate work, colorimetric method, such as the Lovibond or Hellige comparator using nitro-phenol indicator may be used. In quoting colorimetric *p*H reading, the actual indicator used shall be stated.

ANNEX F
(Clause 3.8)

DETERMINATION OF OVERLAP JOINT STRENGTH IN LONGITUDINAL SHEAR

F-l TEST PIECES

Each test piece shall be made from two slips of rotary cut *Canarium spp., Vateria indica* or *Shorea assamica* veneer, 115 mm long, 25.0 ± 0.3 mm wide, 3.15 ± 0.15 mm thick, joined togetherwith the glue to be tested, so as to produce a 25.0 ± 0.3 mm over-lapping joint. The veneer shall be smooth cut on at least one face. The angles ofinclination of the grain of the wood across the face of any test slip shall be not steeper than 1 in 9 and the grain shall not be obviously inclined to the face, that is, through the thickness of the test slip. Each test slip shall be free from knots, whorls, splits, dote or other defects. The moisture content of the slips at the time of gluing shall be 12.0 ± 2.5 percent, which corresponds with conditions obtaining in a normally heated room.

F-2 PREPARATION OF THE GLUE

F-2.1 Weigh the powdered specimen (see Annex A) in a beaker and add the requisite amount of cold, distilled water. Place a watch glass on the beaker, and allow the glue to soak until completely swollen. The temperature of the room shall be 25 ± 2°C and the time of soaking shall be three hours. Then heat the beaker on a water bath (temperature not above 70°C) for 15 minutes, care being taken that the temperature of the solution does not exceed 60°C. During this heating period the solution shall be gently stirred with a glass rod. Care shall be taken that the glue is completely dissolved. This may be ascertained by lifting up the beaker and inspecting through the bottom. The beaker shall then be removed from the water bath.

F-2.2 Aconcentrationof 10 g of glue to 15 mlofwater shall be used unless there is agreement between the purchaser and the supplier on other quantities, which shall be indicated in the report.

F-3 PREPARATION OF TEST PIECES

F-3.1 Six test pieces shall be prepared, as detailed in F-3.2, F-3.3 and F-4.1 in two sets of three each.

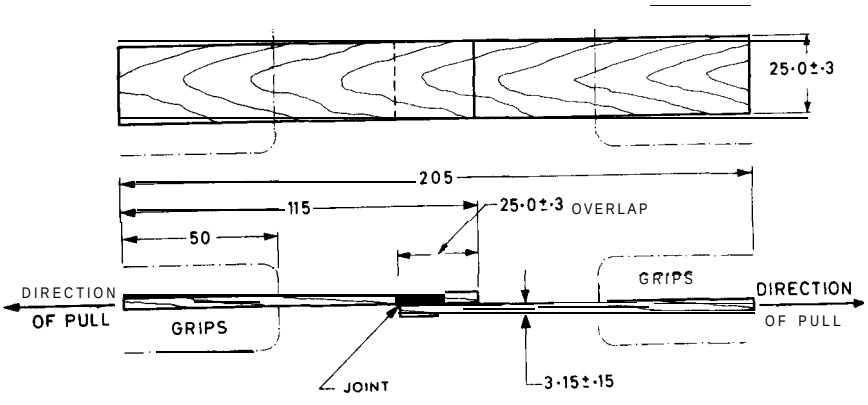
F-3.2 At the time of application of the glue, the wood shall be at ordinary air temperature.

The glue shall be applied with the finger, avoiding air bubbles, to one surface of each of two test slips. When the surface of the glue has become tacky or after the lapse of such time as may be specified by the manufacturer, the surface shall be placed together without rubbing, so as to produce a 25 mm overlap joint thus forming a test piece (see Fig. 1).

F-3.3 It is particularly important that the glued surfaces shall feel tacky (almost jellied) just before the assembling of the joint. Difficulty is sometimes experienced in hot weather, for example, if the room temperature is above 25 ± 2°C, in obtaining the right degree of tackiness. In such a case the test shall not be proceeded with, as the results will be low. The time taken from the application of the glue to the closure of the joint shall not exceed 15 minutes. Each set of three joints shall be placed immediately in a clamp, a convenient form of which is shown in Fig. 2. It is important that the clamp shall apply pressure to the over-lapping portion of the test slips. The pressure shall be approximately 50 kg (500 N) and with the form of clamp shown in Fig. 2, may be obtained by screwing down until 'finger tight'. A convenient jig for locating the joints in the clamp and its contents is shown in Fig. 3.

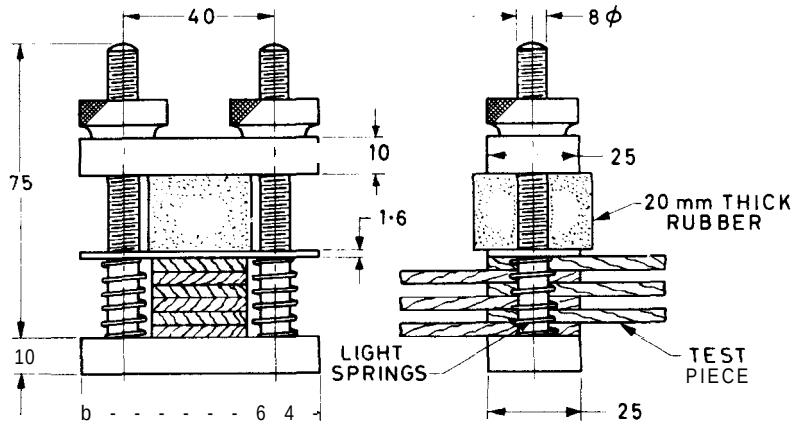
F-4 CLAMPING PERIOD

The joints shall remain in the clamp for 16 to 24 hours under ordinary room conditions, when they shall be



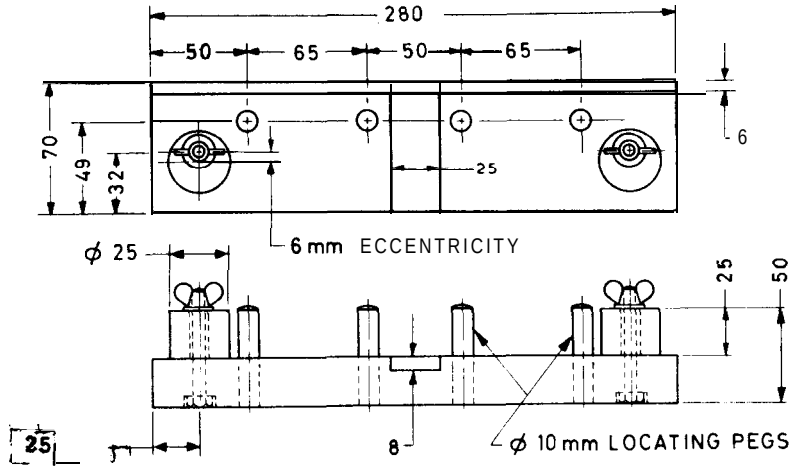
All dimensions in millimetres.

FIG. 1 TEST PIECE



All dimensions in millimetres.

FIG. 2 CLAMPING DEVICE FOR HOLDING TEST PIECES



All dimensions in millimetres.

FIG. 3 WOODEN JIG FOR LOCATING TEST PIECES IN CLAMP

removed from the clamp and freely exposed to air under the same conditions for not less than 24 hours before testing.

F-5 PULLING TEST PIECES

F-5.1 General

Due to the non-axial transmission of load through the prescribed test pieces and the consequent tendency to bend during pulling, the strength which the joints develop in test is influenced by the extent to which the bending is restrained. Testing machines vary widely in this respect, one extreme being represented by the shot-loading type of machine, in which the upper grips are suspended through two articulated joints from a lever free to move longitudinally, while the other extreme is typified by the standard high capacity testing machine with substantial wedge grips in a massive head in which the ends of the test pieces are maintained rigidly in line throughout the test.

F-5.1.1 Control the rate at which the load is applied to the test pieces, the distance between the grips, and the accuracy with which the load is measured. The rate of loading as specified under F-5.3. is designed to take into account the slip experienced by wedge grips, particularly when testing joints after soaking.

F-5.2 Accuracy of Testing Machine

The test pieces shall be pulled in a testing machine capable of measuring load with an accuracy ±1 percent.

F-5.3 Rate of Loading

The rate of loading shall be between 135 kg/min and 270 kg/min (1350 N/min and 2700 N/min).

F-5.4 Distance Between Grips

The distance between the grips of the testing machine shall be between 115 mm to 120 mm.

F-5.5 Computing the Failing Load

The mean failing load for each test shall be computed from the results of a group of six test pieces.

F-5.5.1 The mean failing load shall be stated in kg (N) and not expressed as a stress figure of kg/cm^2 (N/mm^2).

ANNEX G

(*Fore word*)

COMMITTEE COMPOSITION

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BUREAU OF INDIAN **STANDARDS**

Headquarters:

Manak Bhavan. 9 Bahadur Shah Zafar Marg, New Delhi **110002**
Telephones: 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices:	Telephone
Central: Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{331 01 31 {331 13 75
Eastern : 1/14 C. I. T. Scheme VII M. V. I. P. Road, Maniktola CALCUTTA 700054	{37 84 99, 37 85 61 {37 86 26, 37 86 62
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