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IS 15858 (2013): Cotton seed delinting machinery - Delinting Machine with Electrical Heating and Hydraulic System [FAD 20: Food and Agriculture]
Indian Standard

COTTON SEED DELINTING MACHINERY — DELINTING MACHINE WITH ELECTRICAL HEATING AND HYDRAULIC SYSTEM — SPECIFICATION

ICS65.060.70
FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Agriculture and Food Processing Equipment Sectional Committee had been approved by the Food and Agriculture Division Council.

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 'Rules for rounding off numerical values (revised)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.
1 **SCOPE**

This standard specifies material, performance, constructional and other requirements of delinting machine with electrical heating and hydraulic system.

2 **REFERENCES**

The standards listed below contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

<table>
<thead>
<tr>
<th>IS No.</th>
<th>Title</th>
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<tbody>
<tr>
<td>IS 816 : 1969</td>
<td>Code of practice for use of material arc welding for general construction (first revision)</td>
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<tr>
<td>IS 1364 (Part 1) : 2002</td>
<td>Hexagon head bolts, screws and nuts of product grades A and B: Part 1 Hexagon head bolts (size range M 1.6 to M 64) (fourth revision)</td>
</tr>
<tr>
<td>IS 2062 : 2011</td>
<td>Hot rolled medium and high tensile structural steel (seventh revision)</td>
</tr>
<tr>
<td>IS 5624 : 1993</td>
<td>Foundation bolts — Specification (first revision)</td>
</tr>
<tr>
<td>IS 6911 : 1992</td>
<td>Stainless steel plate, sheet and strip — Specification (first revision)</td>
</tr>
</tbody>
</table>

3 **TERMINOLOGY**

For the purpose of this standard following definitions shall apply.

3.1 **Delinting Machine**

The lint fibres on fuzzy cotton seed gets hydrolyzed due to HCl gas treatment. The machine is rotating at 25-30 RPM for better treatment of all fuzzy cotton seeds with HCl gas purged through nozzle on both ends.

3.2 **Fuzzy Seed**

The fuzzy seed is the cotton seed left over after separation of lint from seed cotton (KAPAS) by ginning operation. The cotton seed contains bollworm-affected seed, cut seed, inert matter, trash, oversize and undersize seed, which is not free flowing and cotton linters are white in colour.

3.3 **Delinted Seed**

This delinted seeds are obtained after the treatment of fuzzy seed with dry HCl gas. The lint is hydrolyzed and separated out from the fuzzy seed. The delinted seeds are without white linters on it.

3.4 **Body**

The body of the cotton seed delinting machine is the stationary part of machine, which is fixed on the level ground. All rotating and functions components of delinting machine are supported and rested on machinery body.

3.5 **Delinting Chamber**

Delinting chamber machine is the delinting reactor where proportionate mixing of fuzzy cotton seeds and Anhydrous HCl (AHCl) gas take place and exothermic heat is applied for hydrolysis of white linter.

3.6 **Electrical Heating System**

Electrical heating system is the system of exothermic heating the delinting reactor rotating on machine body. This electrical system provides heat required for process of hydrolysis of white cotton linters.

3.7 **Hydraulic System for Delinting Machine**

Hydraulic system is the system of providing movements like fitting of delinting reactor and opening and closing of lid on reactor to load and unload cotton seeds.

3.8 **HCl Gas Insertion System**

The HCl gas insertion system allows anhydrous HCl compressed gas to bring it down from 65 kg/cm² to 2 kg/cm² with assembly of pressure and gas flow pipe lines of non-corrosive metal.
3.9 Machine Hood with Polycarbonate Sheet

The machine hood collect all the gases released after opening reactor lid to avoid gaseous pollution in the plant. All such collected gases in polycarbonate hood are passed on to pollution control scrubber to dilute it.

4 MATERIALS

4.1 The material of construction of delinting machine with electrical heating and hydraulic system shall be as given in Table 1. The material may conform to the relevant Indian Standard given in Table 1 below:

<table>
<thead>
<tr>
<th>Sl No.</th>
<th>Component</th>
<th>Material</th>
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<tbody>
<tr>
<td>i)</td>
<td>Body</td>
<td>MS plate IS 2062</td>
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<tr>
<td>ii)</td>
<td>Legs</td>
<td>MS channel IS 2062</td>
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<tr>
<td>iii)</td>
<td>Sprocket</td>
<td>Carbon steel IS 2403</td>
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<td>iv)</td>
<td>Chain</td>
<td>Steel IS 2403</td>
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<td>v)</td>
<td>Foundation bolt</td>
<td>Steel IS 5624</td>
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<tr>
<td>vi)</td>
<td>Hexa nut and bolt</td>
<td>Steel IS 1364 (Part 1)</td>
<td></td>
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<td>vii)</td>
<td>Hood</td>
<td>MS angle and polycarbonate sheet IS 2062</td>
<td></td>
</tr>
<tr>
<td>viii)</td>
<td>Hydraulic</td>
<td>MS IS 2062</td>
<td></td>
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<tr>
<td>ix)</td>
<td>Flow meter</td>
<td>S steel, SS-316 L</td>
<td>IS 6911</td>
</tr>
<tr>
<td>x)</td>
<td>Pressure pipe</td>
<td>Reinforced rubber</td>
<td>—</td>
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<tr>
<td>xi)</td>
<td>Rotoseal</td>
<td>MS and rubber</td>
<td>—</td>
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<td>xii)</td>
<td>Rack and pinion</td>
<td>Carbon steel IS 2403</td>
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<td>xiii)</td>
<td>Electrical heaters</td>
<td>Inconel (Nickel chromium)</td>
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<td>xiv)</td>
<td>Pressure gauges</td>
<td>SS-316 L IS 6911</td>
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<tr>
<td>xv)</td>
<td>Hydraulic oil</td>
<td>SAE-40/90</td>
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</table>

5 PERFORMANCE REQUIREMENTS

When tested with the methods given in Annex A the machine shall pass the test.

6 CONSTRUCTIONAL REQUIREMENTS

The MS sheets and MS plates used in the construction of delinting machine shall vary from 3 mm, 5 mm, 8 mm and MS angles 25 mm × 25 mm, 35 mm × 35 mm, 50 mm × 50 mm depending upon the capacity of the machine.

7 OTHER REQUIREMENTS

7.1 The necessary bearing, chain sprocket and power drive shall be provided.

7.2 The necessary provision of greasing, oiling for bearings shall be provided.

7.3 The construction shall be such as to help easy repairs and maintenance.

7.4 The machine shall be provided with facilities for adjustments.

7.5 Minimum leakages of HCl fumes.

7.6 No heating of insulated cover of delinting machine.

8 WORKMANSHIP AND FINISH

8.1 The components of the machine shall be free from crack and other visual defects.

8.2 The welding and joints, if any, shall smooth and non-porous.

8.3 The corrosion resistance coating shall be provided to the body, such as, fibre reinforced plastic (FRP) lining 2 mm thick.

8.4 The control and adjustment provided shall be easy and smooth operating.

9 MARKING AND PACKING

9.1 Marking

Each delinting machine with electrical heating and hydraulic system shall be marked with the following particulars:

a) Manufacturer’s name and address;

b) Model number;

c) Power rating;

d) Drive details;

e) Batch or code number, if any; and

f) Year of manufacture.

9.1.1 Each delinting machine may also be marked with the overall size and approximate weight of machine or this information may be given in the catalogue supplied by the manufacturer.

9.2 BIS Certification Marking

Each delinting machine with electrical heating and hydraulic system may also be marked with the Standard Mark.

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

9.3 Packing

The packing of delinting machine with electrical heating and hydraulic system shall be done as agreed to between the supplier and purchaser.
A-1 PRELIMINARY RUNNING AND ADJUSTMENTS

A-1.1 The delinting machine with electrical heating and hydraulic system shall be installed on hard surface preferably levelled.

A-1.2 The delinting machine with electrical heating and hydraulic system shall be preliminary run at the specified speed for about 30 min before commencing the test. All the adjustments shall be carried out in accordance with the recommendations of the manufacturers.

A-2 TEST AT NO LOAD

After preliminary running is over the delinting machine with electrical heating and hydraulic system shall be run at no load for 10 min at the specific speed. During and after the no load run, the visual observation of the delinting machine shall not show the following:

a) Presence of any marked vibration during the operation.

b) Presence of undue knocking sound or rattling sound.

c) Any marked rise in the bearing temperature.

d) Any marked unusual wear or slackness in any component.

A-3 TEST AT LOAD

The delinting machine with electrical heating and hydraulic system shall be operated at its input capacity specified by the manufacturer incorporating best combination of adjustment for a period of 30 min. The machine shall run continuously without any breakdown. During the running period rpm of drum shall be noted. The observed speed shall not be less than one percent of the specified speed.

A-4 LONG RUN TEST

The delinting machine with electrical heating and hydraulic system shall be operated for a minimum period of 20-h duration. During and after the operation no breakdown or defects shall be developed in the delinting machine.
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This Indian Standard has been developed from Doc No. : FAD 20 (1743).

Amendments Issued Since Publication

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