GREAVES GSBS 20
BATTERY CUM HAND OPERATED KNAPSACK SPRAYER
1. Date of test: 15.09.2017
2. Atmospheric conditions:
   a) Temperature: 32 °C
   b) Relative humidity: 66 %
   c) Pressure: 97.9 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>Speed of Pump (rpm)</th>
<th>Working Pressure (kg/cm²)</th>
<th>Test No.</th>
<th>Delivery from the discharge line (ml/min)</th>
<th>Overflow</th>
<th>Average discharge from the discharge line (ml/min)</th>
<th>Discharge rate of pump (ml/min)</th>
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</tbody>
</table>

Minimum discharge rate = 1337.5 ml/min at 4.0 kg/cm²
Maximum discharge rate = 1750 ml/min at 2 kg/cm²
Discharge at rated pressure = 1515.0 ml/min at 3.0 kg/cm²
4. TEST FOR VOLUMETRIC EFFICIENCY
(Vide Clause 8.4 of IS : 11313 - 2007)

Date of test : 15.09.2017
Rated pressure, kg/cm² : 3 kg/cm²
Avg. discharge of water at rated pressure, l/min : 1.525
Avg. discharge of water at no load, l/min : 2.815
Avg. pump speed at no load, rev/min : 3144
Avg. pump speed at rated pressure, rev/min : 2564
Volumetric efficiency of pump, % : 66%

Remark: The volumetric efficiency does not conform to the requirement of IS:11313-2007.

5. POWER REQUIREMENT
(Vide Clause 8.5 of IS – 11313 : 2007)

The power requirement of DC motor fitted on sprayer was observed as following.
1. Motor operating voltage : 12 V
2. Avg. current drawn by motor at no load : 0.92 A
3. Avg. current drawn by motor at load : 1.96 A
4. Avg. motor operating voltage : 12.70V
5. Avg. observed motor power requirement : 24.97 Watt
6. Avg. motor speed at no load : 3144 rpm
7. Avg. motor speed at on load : 2169 rpm
8. Avg. Time required for fully discharge of battery : 7.8 to 8.2 hr.
9. Avg. No load rpm of motor after 6 hours of Operation : 2280 rpm

6. PRESSURE ADJUSTMENT TEST
(Vide Clause 8.7.1 of IS – 11313 : 2007)

1. Date of test : 15.09.2017
2. Atmospheric conditions :
   a. Temperature : 32 °C
   b. Relative humidity : 66 %
   c. Pressure : 97.9 kPa
3. Data recorded

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Working pressure (kg/cm²)</th>
<th>Fluctuation range (kg/cm²)</th>
<th>Pressure drop (kg/cm²)</th>
<th>Ratio</th>
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<tbody>
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<td>4.0</td>
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</table>
4. Resistance of pressure: Yes
24. CONFORMITY TO INDIAN STANDARDS

i) IS: 11313:2007 Hydraulic power sprayers- specification
   Does not conform in toto

ii) IS: 10134-1994-Method of test for manually
    operated sprayer
   Does not conform in toto

iii) Spray nozzle and spray gun as per IS:3652-
    1995 (Reaffirmed 2011)
    Does not conform in toto

vi) IS: 2643-2005-Pipe threads where pressure-
    tight joint are not made on the thread-
    dimensions, tolerance and designation
    Does not conform in toto

25. COMMENTS & RECOMMENDATIONS

25.1 The sprayer serial number and year of manufacture is not marked. It MUST be marked.

25.2 The motor power and rated speed is not specified. It should be specified.

25.3 The battery of sprayer was observed defective after 32 hours of operation. On applicant’s request it was replaced with new one. The battery of better quality MUST be used on sprayer

25.4 Make, model and country of origin of battery charger is not specified. It should be specified.

25.5 The model and country of origin of pump is not specified. It MUST be specified.

25.6 The dimension of straps does not meet the requirements of Indian Standard. It MUST be looked into.

25.7 During the strap drop test the buckle/bracket of strap assembly found failed to hold the strap in its position. It should be provided.

25.8 The metallic threaded connection provided on sprayer does not meet the requirement of Indian Standard. It MUST be looked into.

25.9 The batch or code number on nozzle is not provided. It MUST be looked into.

25.10 The strap cushion thickness does not meet the requirement of Indian standard. It MUST be looked into.

25.11 The strainer area does not meet the requirement of Indian standard. It must be looked into.

25.12 The spray angle of nozzle at 300 kPa pressure does not conform to the requirement of IS:3652-1995. It MUST be looked into.
25.13 Percentage variation of discharge observed during endurance test in battery operating mode does not confirm to the requirement of Indian Standard. It **MUST** be looked into.

25.14 The lance is not marked with batch or code number. It **MUST** be marked.

25.15 The discharge rate of nozzle at a pressure of 300 kPa for fine cone spray and jet spray pattern does not conform to the requirement of IS: 3652-1995.

25.16 The cut off device is not marked. It must be marked.

25.17 The trigger actuation force is observed more than as defined in Indian Standard. It **MUST** be examined & improved.

25.18 The strainer in nozzle is not provided. It should be provided.

25.19 Agitator is not provided in sprayer. It may be provided.

25.20 The batch or code number and type of cut-off device is not marked. It **MUST** be marked.

25.21 Time required to full charge battery with AC charger is observed as 10.1 to 11.1 hours.

25.22 The spraying operation time after fully charging the battery was observed as 7.8 to 8.2 hours.

25.23 **The volumetric efficiency of sprayer on battery operated mode was observed as 66%, which is not within the requirement of the relevant Indian Standard.**

25.24 The sprayer does not conform to the relevant standard in toto. It **MUST** be looked into.

25.25 The nozzle is not marked. It should be marked.

25.26 During the pump chamber hydraulic test the motor stopped beyond 5.0 kg/cm² pressure against the pressure requirement of 7.5 kg/cm². Thus the sprayer does not meet the requirement of Indian Standard.

25.27 A suitable labelling plate (not sticker) needs to be provided with, *inter alia*, following information:-
   i. Manufacturer's name
   ii. Make
   iii. Model
   iv. Month & year of manufacture
   v. Rated speed
   vi. Rated pressure
   vii. Discharge rate
   viii. Power rating
   ix. Country of origin

25.28 The tank capacity of sprayer does not meet the requirement of Indian Standard. It **MUST** be looked into.