

व्यावसायिक परीक्षण रिपोर्ट  
COMMERCIAL TEST REPORT

संख्या/ No.: PS-455/2572/2020  
माह/Month: November, 2020

**THIS TEST REPORT VALID UP TO : 30<sup>th</sup> November, 2027**



**SKYTEC, ST-204  
ENGINE OPERATED KNAPSACK SPRAYER**



भारत सरकार

Government of India

कृषि एवं किसान कल्याण मंत्रालय

Ministry of Agriculture and Farmers Welfare

कृषि, सहकारिता एवं किसान कल्याण विभाग

Department of Agriculture, Cooperation and Farmers Welfare

उत्तरी क्षेत्र कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

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xvi)	Tank	Galvanized iron, Brass, Fiber glass reinforced plastics, plastics	Plastic	Conforms
xvii)	Pipe for agitator	Galvanized iron, Brass, PVC	PVC	Conforms
xviii)	Piston (bucket) screw	Brass, stainless steel	Not applicable	--
xix)	Crank case	Aluminum alloy	Not applicable	--
xx)	Roller pump body	Nickel resistant cast iron	Not applicable	--
xxi)	Roller pump and plate	Nickel resistant cast iron	Not applicable	--
xxii)	Roller pump rotor	Nickel resistant cast iron	Not applicable	--
xxiii)	Piston pump crank shaft	Carbon steel	A quadrant gear driven by drive shaft of gear box mounted on plunger rod.	--
xxiv)	Pump inlet port end fitting	Brass	Brass	Conforms
xxv)	Piston rod guide	Brass, Aluminum alloy, Gunmetal, Nylon	Not applicable	--
xxvi)	Connecting rod	Carbon steel	N.A.	--
xxvii)	Gudgeon pin	Carbon steel	N.A.	--
xxviii)	Big end bearing	Steel coated with tin base white metal	Not applicable	--
xxix)	Small end bush	Gunmetal	Not applicable	--
xxx)	The material used for different components shall be declared by the manufacturer all the components mentioned in the table-I may not be present in a particular sprayer.		Declared by the applicant	Conforms

### 3. TEST FOR DISCHARGE RATE OF PUMP

[vide Clause 8.3 of IS- 11313: 2007]

1. Date of test : 13/11/2020
2. Atmospheric conditions
  - a) Temperature : 27° C
  - b) Relative humidity : 38 %
  - c) Pressure : 99.4 Kpa
3. Data recorded

Speed of engine (rpm)	Working pressure (kg/cm <sup>2</sup> )	Test No.	Delivery from the discharge line (ml/min)	Overflow (ml/min)	Average delivery from the discharge line (ml/min)	Discharge rate of pump (ml/min)	Hydraulic Power (kW)
5612	10	1.	6100	NIL	6125.0	6125.0	0.10
		2.	6120				
		3.	6180				
		4.	6140				

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5387	12	1.	6000	NIL	5992.5	5992.5	0.12
		2.	5970				
		3.	5990				
		4.	6010				
5220	14	1.	5900	NIL	5857.5	5857.5	0.14
		2.	5850				
		3.	5810				
		4.	5870				
4977	16	1.	5320	NIL	5287.5	5287.5	0.14
		2.	5280				
		3.	5250				
		4.	5300				

**Minimum discharge rate** = 5287.5 ml/min at 16 kg/cm<sup>2</sup>  
**Maximum discharge rate** = 6125.0 ml/min at 10 kg/cm<sup>2</sup>  
**Discharge at rated pressure** = 6125.0 ml/min at 10 kg/cm<sup>2</sup>

#### 4. TEST FOR VOLUMETRIC EFFICIENCY OF PUMP [vide clause 8.4 of IS: 11313-2007]

Date : 13.11.2020  
 Rated pressure, kg/cm<sup>2</sup> : 10  
 Engine speed corresponding to rated pressure (rpm) : 5610  
 Theoretical cubic capacity of pump, ml : 6562.08  
 Actual volume at rated pressure, ml : 6145.00  
 Volumetric efficiency, % : 93.6

#### 5. POWER REQUIREMENT

During the pump operation from minimum to maximum pressure range, the max. hydraulic power was observed as 0.14 kW against the declared net power output of engine as 0.75 kW.

#### 6. ENGINE PERFORMANCE TEST

In pursuance of Ministry's order No. 7-23/2011-M&T (I&P) dated 20.04.2011 the engine performance test has not been conducted and the specifications/performance as specified by the applicant/ declared in the manual have been endorsed.

S.No.	Parameter	Declaration
i	Engine Type	: Single cylinder, 4 stroke, air cooled, Petrol engine.
ii	Bore,(mm)	: 39
iii	Stroke (mm)	: 26
iv	Displacement,(cc)	: 31.1
v	Net power out put	: 0.75 kW @ 6500 rpm
vi	Max Torque	: 1.1 Nm @ 5000 rpm

**7. PRESSURE ADJUSTMENT TEST**  
**(Vide clause 8.7.1 of IS: 11313-2007)**

1. Date of test : 13.11.2020
2. Atmospheric conditions
  - a. Temperature : 27 °C
  - b. Relative humidity : 38 %
  - c. Pressure : 99.4 kPa
3. Data recorded
- 4.

S. No.	Working pressure(kg/cm <sup>2</sup> )	Fluctuation range (kg/cm <sup>2</sup> )	Pressure drop (kg/cm <sup>2</sup> )	Ratio
1.	10	NIL	NIL	--
2.	12	NIL	NIL	--
3.	14	NIL	NIL	--
4.	16	NIL	NIL	--

5. Resistance of pressure: Yes

**8. TEST FOR HYDRAULIC SPRAY GUN**  
**[vide Clause 7.3(b) of IS- 11313: 2007 & Annex E of IS- 3652; 1995]**

Date of test : 11.11.2020  
 Type of gun : Screw type

**8.1 TEST FOR DISCHARGE RATE OF SPRAY GUN**

The discharge rate for fine cone spray & jet spray pattern as 2977.5 ml/min & 5125 ml/min at the pressure of 600 kPa was declared by the applicant. The discharge rate corresponding to 600 kPa pressure was observed as under

- For fine cone spray pattern : 3090.0 ml/min
- For jet spray pattern : 3240.0 ml/min

**Remarks – The observed discharge rate for jet spray pattern was not within limit specified by the relevant code/Standard.**

**8.2 TEST FOR SPRAY ANGLE OF SPRAY GUN**

The spray angle for fine cone spray pattern at a pressure of 600 kPa was declared as 65 degree by the applicant. The same was observed as 71.9 degree.

**Remarks:- The spray angle for fine cone spray pattern at a pressure of 600 kPa was observed not within the limit specified by the relevant code/standards.**

**8.3 STRENGTH OF GUN**

Sr. No	Details	Condition
1	Condition of nozzle tip	Closed
2	Hydraulic pressure	1500 kPa
3	Duration of pressure	5 Minute
4	Result	No leak, crack or burst of gun was observed during test.



## 17. COMMENTS AND RECOMMENDATIONS

- 17.1 Serial number and year of manufacture of sprayer is not specified. It **MUST** be looked into.
- 17.2 Serial number of engine is not specified. It **MUST** be looked into.
- 17.3 Manufacturing year, serial number and country of origin of pump is not specified. It **MUST** be looked into.
- 17.4 The spray angle for fine cone spray pattern of spray gun at a pressure of 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.
- 17.5 The discharge rate for jet spray pattern of gun at a pressure of 600 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 17.6 The spray angle for fine cone spray pattern of spray gun at a pressure of 600 kPa does not conform to the requirement of IS:3652-1995. It **MUST** be looked into.
- 17.7 The spray gun is not designated and marked by its identification mark. The identification mark as per specified by Indian Standard. It **MUST** be looked into.
- 17.8 The discharge rate for jet spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 17.9 The spray angle for fine cone spray pattern of nozzle at a pressure of 300 kPa does not conform to the requirement of IS: 3652-1995. It **MUST** be looked into.
- 17.10 The spray nozzle is not designated and marked by its identification mark. The identification mark as specified by relevant Indian standard. It **MUST** be looked into.
- 17.11 At rated pressure of 10 Kg/cm<sup>2</sup> the pump discharge was observed as 6125 ml/min. against the minimum requirement of 8000.0 ml/min. This **MUST** be examined.
- 17.12 The necessary tools are not provided. It **MUST** be looked into.
- 17.13 The diameter of connecting rod of the gun does not meet the requirement of Indian standard. It **MUST** be looked into.
- 17.14 The strainer in nozzle is not provided. It may be considered for providing.
- 17.15 The Make and Model of sprayer, engine and pump all are given as "SKYTEC, ST-204". For the sake of clarity this may be looked into for necessary amendment.
- 17.16 The pressure gauge with full scale reading 100 bar is provided, thus it does not conform to requirement of IS:11313-2007. It **MUST** be looked into.
- 17.17 A suitable labeling plate (not sticker) needs to be provided with "inter alia, following information :
- i) Manufacturer's name.
  - ii) Make
  - iii) Model
  - iv) Month & years of manufacturer.
  - v) Rated speed
  - vi) Rated pressure
  - vii) Discharge rate
  - Vii) Power rating of engine
  - ix) SFC of engine.





**18. TECHNICAL LITERATURE**

One leaflet entitled "Back pack power sprayer operator's manual" has been provided. The same, however, does not indicate the make and model of the sprayer it is related to. It amounts to not providing the relevant literature.

It is therefore recommended that the literature be brought out as per is 8132-1999.

**TESTING AUTHORITY**

MAAN SINGH SENIOR TECHNICAL ASSISTANT	
P. K. PANDEY DIRECTOR	

**19. APPLICANT'S COMMENTS**

" We will inform all your recommendations to our manufacturer to make all possible and necessary changes for our future products"

