



THIS TEST REPORT IS VALID UPTO 31.10.2032



NIPHA, NFS-BC35-4S, BRUSH CUTTER



भारत सरकार

GOVERNMENT OF INDIA

कृषि एवं किसान कल्याण मंत्रालय

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

कृषि एवं किसान कल्याण विभाग

DEPARTMENT OF AGRICULTURE AND FARMERS WELFARE

उत्तर पूर्वी क्षेत्र कृषि यंत्र प्रशिक्षण एवं परीक्षण संस्थान

NORTH EASTERN REGION FARM MACHINERY TRAINING & TESTING INSTITUTE

बिश्वनाथ चारिआलि, जिला - बिश्वनाथ(असम)

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MISC/NERFMTTI, B. Chariali/ 03/03/551	NIPHA, NFS-BC35-4S BRUSH CUTTER	COMMERCIAL (INITIAL)
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## 1. SCOPE OF TEST

### 1.1 LABORATORY TEST

- Checking of specifications
- Mechanical vibration measurement
- Noise measurement
- Wear assessment of critical components
- Engine performance test

### 1.2 FIELD TEST

- Rate of work
- Quality of work
- Labour requirement
- Adequacy of prime mover power
- Ease of operation, adjustment and safety provisions
- Defects, breakdowns and repairs



## 2. METHOD OF SELECTION

The test sample was selected by the testing authority through random selection. The following test samples were presented by the applicant during random selection.

Sr. No.	Serial No. of test sample	Remarks
1	WB/782/373/2025/0004	Out of 5 samples, Sr. No.3 sample was randomly selected.
2	WB/782/373/2025/0001	
3	WB/782/373/2025/0002	
4	WB/782/373/2025/0003	
5	WB/782/373/2025/0005	

## 3. TEST CODE AND PROCEDURE

There is no Indian Standard Test Code available for testing of brush cutter as such. However, for engine performance test, IS 7347-1974 (Reaffirmed 2021) was referred.

## 4. SPECIFICATIONS

### 4.1 General:

Name of the Machine : Brush Cutter

Name and address of the manufacturer : Taizhou Dongfeng Technology CO Ltd,  
289 Houcang Road, Zegou town, Wenling  
City, Taizhou, Zhejiang Province,  
CHINA

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Name and address of applicant : NIPHA EXPORTS P LTD, 48, Ganga  
Jamuna, 28/1, Shake Speare, Sarani,  
Kolkata, West Bengal, 700017

Make

: NIPHA

Model

: NFS-BC35-4S

Serial No.

: WB/782/373/2025/0002

Type

: Engine operated

Type of cutting attachment

: Nylon rope and straight blade

Year of manufacture

: 2025

Country of origin

: CHINA

Type of crops/bush recommended

: All kinds of weeds/bushes

### 4.2 Constructional details:

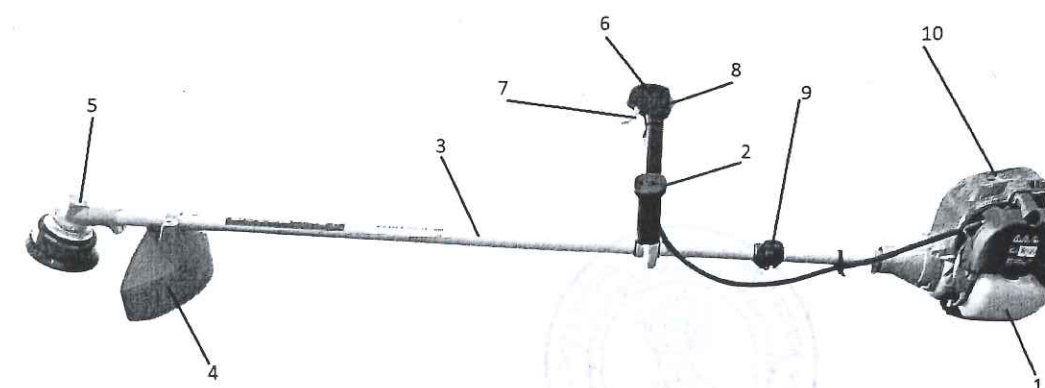


Fig. 1: BRUSH CUTTER, MAKE: NIPHA, MODEL:NFS-BC35-4S

### Key words:

- Fuel tank
- LHS handle
- Transmission cover pipe
- Deflector
- Gear case
- RHS handle
- Throttle cum clutch trigger
- Engine stopping switch
- Connection for shoulder strap
- Engine



## 10. HARDNESS AND CHEMICAL COMPOSITION

### 10.1 Hardness of straight blade:

Sr. No.	Hardness as per IS: 6025 – 2024 (HRC)	Hardness as measured (HRC)	Remarks
1	45 to 62	33	Does not conform

### 10.2 Chemical composition of straight blade:

The results of chemical analysis test of circular blade were as under.

Constituent	As per IS: 6025 – 2024 (%)	Composition as observed (% by weight)	Remarks
Carbon (C)	0.50 to 0.95	0.560	Conforms
Manganese (Mn)	0.2 to 0.8	0.894	Does not conform
Silicon (Si)	--	0.317	--
Sulphur (S)	--	0.015	--
Phosphorous (P)	--	0.021	--

## 11. WEAR ANALYSIS OF CRITICAL COMPONENTS

Component	Duration of operation (h)	Initial mass (g)	Mass after operation (g)	Loss of mass (g)	Percentage of wear	Percentage of wear on hourly basis
Straight blade	10.25	377.81	370.40	7.41	1.96	0.19

## 12. FIELD PERFORMANCE TEST

Field tests were conducted for total of 25.33 hours duration. Grass/weeds cutting with nylon rope and bush cutting with straight blade attachment were carried out for 15.08 hours and 10.25 hours, respectively. A total of five test trials were conducted at rated engine speed of 7800 rpm. Detailed results of field tests are shown in ANNEXURE-I & II and summarized in the ensuing Table. Details of operators have been given in ANNEXURE-III.





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#### SUMMARY OF FIELD PERFORMANCE TEST

Sr. No.	Parameters	Grass cutting with nylon rope	Bush cutting with straight blade
1	Field Condition	Level	
2	Thickness of stem of Grass/Bush at cutting height (mm)	2.21 to 3.16	13.36 to 14.46
3	Number of Grass/Bush per m <sup>2</sup>	105 to 112	38 to 46
4	Height of Grass/Bush (mm)	144.6 to 158.2	1466.6 to 1553.3
5	Mass of Grass/Bush cut (kg/h)	40.61 to 42.16	190.9 to 884.8
6	Mass of Grass/Bush cut (kg/ha)	1240 to 1310	21380 to 22120
7	Rate of work (ha/h)	0.031 to 0.034	0.037 to 0.040
8	Time required for one hectare (h)	29.41 to 32.26	25.00 to 27.03
9	Fuel consumption:		
	-l/h	0.67 to 0.68	0.76 to 0.77
	-l/ha	19.70 to 21.94	19.00 to 20.81

#### 12.1 Grass/Weeds cutting using nylon rope:

##### 12.1.1 Rate of work:

The area of cut was recorded as 0.031 to 0.034 ha/h.

Time required for one hectare was recorded as 29.41 to 32.26 hours.

Mass of weeds cut was 40.61 to 42.16 kg/h.

##### 12.1.2 Fuel consumption:

Fuel consumption was observed as 0.67 to 0.68 l/h and 19.70 to 21.94 l/ha.

#### 12.2 Bush cutting using straight blade:

##### 12.2.1 Rate of work:

The area of cut was recorded as 0.037 to 0.040 ha/h.

Time required for one hectare was recorded as 25.00 to 27.03 hours.

Mass of weeds cut was 190.9 to 884.8 kg/h.

##### 12.2.2 Fuel consumption:

Fuel consumption was observed as 0.76 to 0.77 l/h and 19.00 to 20.81 l/ha.

#### 12.3 Labour/operator requirement:

It was observed that an averagely built person can able to operate the brush cutter for 40 to 45 minutes at a stretch. Hence, two operators are required for continuous operation of the brush cutter.

#### 12.4 Adequacy of prime mover power:

The power of the prime mover was found adequate.

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#### 13. EASE OF OPERATION AND ADJUSTMENTS

No difficulties were observed in operation and adjustment during the field test.

#### 14. DEFECTS, BREAKDOWNS AND REPAIRS

No noticeable defect or breakdown was observed during test.

#### 15. COMPONENTS/ASSEMBLY INSPECTION

The Engine was dismantled after 35.16 hours of operation.

##### 15.1 Engine:

##### Cylinder bore:

Cylinder bore dia., mm						Max. permissible wear limit, mm
Top position		Middle position		Bottom position		
Thrust side	Non-thrust side	Thrust side	Non-thrust side	Thrust side	Non-thrust side	
39.15	39.04	39.14	39.07	39.15	39.06	39.165

##### Piston:

Piston dia., mm				Clearance between piston & cylinder liner at the skirt of the piston, mm	Max. permissible Clearance limit, mm
Top (above top compression ring)		At skirt			
Thrust side	Non-thrust side	Thrust side	Non-thrust side		
38.74	38.75	38.97	*	0.18	0.30

\*Not recorded due to piston design constraints

##### Ring end gap:

Rings	Ring end gap, mm			Max. permissible end gap limit, mm
	Top	Middle	Bottom	
1 <sup>st</sup> comp. ring	0.09	0.09	0.10	0.10
2 <sup>nd</sup> comp. ring	0.09	0.09	0.10	
Oil ring	NA	NA	NA	

##### Ring side clearance:

Rings	Ring side clearance, mm	Max. permissible clearance limit, mm
1 <sup>st</sup> comp. ring	0.06	0.30
2 <sup>nd</sup> comp. ring	0.06	
Oil ring	*	

\*Not recorded due to ring design constraints



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Main bearings: 6202-1No. and 6201 -1No.

Bearing No.	Type of bearing	Diametrical clearance, mm	Crankshaft end float, mm	Max. permissible clearance limit, mm	
				Diametrical clearance	Crankshaft end float
1	Ball bearing	NA	0.09	0.25	0.30
2	Ball bearing	NA			

Big end bearing:

Bearing No.	Clearance, mm		Max. permissible clearance limit, mm	
	Diametrical	Axial	Diametrical	Axial
1	Needle bearing	NR	0.146	1.1

Measurement of big end bearing clearance was not possible as the piston along with connecting rod was not detachable.

#### 15.2 Valve, guide and timing gear:

Any marked sign of overheating of valves : None  
Pitting of seat/faces of valves : None  
Any visual damage of teeth of timing gears : None  
Condition of ignition coil & magneto : Normal

#### Transmission system:

All the gears of the transmission system were found in normal condition.



### 16. CRITICAL TECHNICAL SPECIFICATIONS (Vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019)


Sr. No.	Parameters	Specifications	Observation	Remarks
1	2	3	4	5
1	Type	Self-propelled, portable	Self-propelled, portable	Conforms
2	Type of cutting attachment	Circular disc / Straight blade / nylon rope	Straight blade / nylon rope	Conforms
3	Teeth thickness (mm)	2.0 Min.	NA	--
4	Hardness of blade, HRC	68 - 70	33	Does not conform
Straight blade				
5	Diameter of straight blade (mm)	250 - 350	300.46	Conforms
6	Width at ends /at center (mm)	50 / 70, Min.	90.45	Conforms

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1	2	3	4	5
7	Thickness of straight blade (mm)	1.5 Min.	2.0	Conforms
8	Length of nylon rope (mm)	2000 - 4000	2000	Conforms
9	Diameter of nylon rope (mm)	2.5 to 4.0	3.0	Conforms
10	Type of engine	Compression ignition / Spark ignition	Spark ignition	Conforms
11	Starting method	Manual / recoil / self -starting	Recoil starting	Conforms
12	Type of clutch	Cone / Centrifugal	Centrifugal	Conforms
13	Type of gear drive	Bevel pinion	Bevel pinion	Conforms
14	Capacity of fuel tank (l)	1.0 (Min.)	0.72	Does not conform
15	On /Off provision in fuel Supply system	Must be provided	Not provided	Does not conform
16	Provision for easy start of engine	Must be provided	Provided	Conforms
17	Provision for emergency stop of engine	Must be provided	Provided	Conforms
18	Provision for shield / cover to prevent flying of mud & stone from rotor	Must be provided	NA	--
19	Provision for Grass deflector at the rear of the cutting mechanism	Must be provided	Provided	Conforms
20	Provision for Pad with shoulder belt to dampen the vibration	Must be provided	Provided	Conforms
21	Provision for cover on exhaust	Must be provided	Provided	Conforms
22	Direction of exhaust emission away from operator	Must be provided	Provided	Conforms
23	Provision for safety kit (helmet, earplug, mask, hand gloves, safety protective cloth, safety shoes)	Must be provided	Provided	Conforms





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1	2	3	4	5
24	Marking /labeling of machine 	The labeling plate should be riveted on the body of machine having Name and address of manufacturer & Applicant, Country of origin, Make, Model, Year of manufacturer, Serial number, Engine number, Engine HP, rated rpm & SFC.	Name and address of manufacturer & Applicant, Country of origin, Year of manufacture, Engine number, rated rpm & SFC were not provided on the labeling sticker. Instead of labeling plate, a sticker was pasted on the machine.	Does not conform
25	Literature	Operator manual, Service manual and Parts catalogue should be provided.	Provided	Conforms

#### 17. COMMENTS AND RECOMMENDATIONS

- 17.1 The average rated power in rating test of engine was observed as 0.60 kW against declared value of 0.84 kW by the applicant/manufacturer. This should be looked into for corrective action.
- 17.2 The engine was not marked with Manufacturer name or trade-mark, Rated power, Rated speed and type of fuel used which does not fulfill the requirement of IS 7347-1974 (Amended 2021). This should be looked into.
- 17.3 The hardness and chemical composition of straight blade does not conform to Indian Standard IS 6025-2024. This should be looked into for corrective action.
- 17.4 The labeling plate should be riveted on the body of machine having name and address of the manufacturer, Country of origin, Make, Model, Year of manufacture, Serial number, Engine number, Engine HP, rated rpm and SFC. This should be looked into.
- 17.5 Material and hardness of straight blade, capacity of fuel tank and on/off provision in fuel supply system do not conform to critical technical specifications vide Ministry's letter No. 13-9/2019-(M&T) (I&P)-Part dated 26.04.2019. This should be looked into for corrective action.
- 17.6 Noise at operator's ear level was observed on higher side against danger limit of 90 dB(A) as specified by International Labour Organization (ILO) for continuous exposure of 8 hours per day. This calls for reduction in noise level to improve the operational comfort and safety of operator.
- 17.7 The amplitude of mechanical vibration at various assemblies viz. engine cover and Frame pipe were on higher side. This calls for dampening down of vibration to improve the operational comfort and service life of the components.

#### 17.8 Adequacy of Literature:

The following literature in English language was provided for reference during testing:

- Operator's/ Service manual
- Parts catalogue

It is recommended to bring out the manual in Hindi and other vernacular languages as per IS: 8132-2023.

#### TESTING AUTHORITY

(M.R. PATIL)  
SENIOR AGRICULTURAL ENGINEER

(P. KAMALABAI)  
DIRECTOR

Draft test report compiled by - Sh. D. Deori, Technical Assistant

#### 18. APPLICANT'S COMMENTS

We will take necessary action as per comments and recommendations in the test report in our future products/supply.



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#### ANNEXURE-I

#### FIELD PERFORMANCE TEST

Cutting attachment : Nylon rope (Tap and Go)  
Place of test : NERFMTTI, Biswanath Chariali, Biswanath, Assam  
Usage : Grass cutting

Sr. No.	Parameters	Test trial	
		I	II
1	Date of test	29.09.2025	30.09.2025
2	Net test duration (h)	7.5	7.58
3	Avg. height of weeds (mm)	158.2	144.6
4	Avg. thickness of stem of weeds at cutting height (mm)	2.21	3.16
5	Avg. No. of weeds per m <sup>2</sup>	112	105
6	Avg. mass of weeds cut per m <sup>2</sup> (g)	131	124
7	Actual area cut (ha/h)	0.031	0.034
8	Time required for one ha (h/ha)	32.26	29.41
9	Mass of weeds cut		
	kg/h	40.61	42.16
	kg/ha	1310	1240
10	Fuel consumption		
	l/h	0.68	0.67
	l/ha	21.94	19.70



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#### ANNEXURE-II

#### FIELD PERFORMANCE TEST

Cutting attachment : Straight blade  
Place of test : NERFMTTI, Biswanath Chariali, Biswanath, Assam  
Usage : Bush cutting



Sr. No.	Parameters	Test trial	
		I	II
1	Date of test	06.10.2025	07.10.2025
2	Net test duration (h)	5.17	5.08
3	Avg. height of bush (mm)	1553.33	1466.67
4	Avg. thickness of stem of bush at cutting height (mm)	14.46	13.36
5	Avg. No. of bush per m <sup>2</sup>	38	46
6	Avg. mass of bush cut per m <sup>2</sup> (g)	2212	2138
7	Actual area cut (ha/h)	0.04	0.037
8	Time required for one ha (h/ha)	25	27.03
9	Mass of bush cut		
	kg/h	884.8	790.97
	kg/ha	22120	21380
10	Fuel consumption		
	l/h	0.76	0.77
	l/ha	19	20.81

#### ANNEXURE-III

#### DETAILS OF OPERATORS

Operator	:	I	II	III	IV
Age, years	:	34	29	28	31
Height, cm	:	165	171	169	160
Weight, kg	:	65	58	60	63