



**3rd DRAFT**

**SOCIALIST REPUBLIC OF VIETNAM**

**QCVN XX-ZZ: 2023/BNNPTNT**

**NATIONAL TECHNICAL REGULATIONS  
ABOUT SAFETY FOR HAND MOWERS  
USED IN AGRICULTURE AND FORESTRY**

**HA NOI – 2023**



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## **First word**

QCVN XX-ZZ: 2023/BNNPTNT compiled by Machine and Equipment Inspection Center - Institute of Agricultural Electromechanics and Post-harvest Technology; Department of Science, Technology and Environment for approval; The Ministry of Science and Technology appraised, the Minister of Agriculture and Rural Development issued according to Circular No. .... /...../TT-BNNPTNT day/month/year.

# NATIONAL TECHNICAL REGULATIONS ON SAFETY FOR HANDHELD GRASS MOWERS USED IN AGRICULTURE AND FORESTRY

## 1. GENERAL RULES

### 1.1. Scope

This regulation stipulates technical requirements and management requirements to ensure safety for hand-held lawn mowers used in agriculture and forestry (HS Code 84332000).

This regulation does not apply to hand-held lawn mowers imported or domestically produced before the effective date of this regulation.

### 1.2. Applicable subjects

This regulation applies to organizations and individuals that produce, import, distribute and trade hand-held lawn mowers used in agriculture and forestry (hereinafter referred to as enterprises). State management agencies and other relevant organizations and individuals.

### 1.3. Explanation of words

#### 1.3.1. Batch to goods

Including hand-held lawn mowers with the same name, use, brand, type, technical characteristics of the same production facility, origin and same import records.

#### 1.3.2. Handheld lawn mower

The machine includes a shoulder-mounted power unit, drive shaft, cutting and shielding parts. The machine is used to cut weeds, bushes, small trees and similar plants.

##### 1.3.2.1. Bush cutter

A bush mower is a hand-held lawn mower in which the cutting part is a metal or non-metal rotary cutter.

##### 1.3.2.2. Lawn mower

A lawn mower is a hand-held lawn mower in which the cutting part is a soft, elastic or malleable, plastic cord.

##### 1.3.2.3. Bush saw

A bush saw is a hand-held lawn mower in which the cutting part is a serrated cutting disc.

##### 1.3.2.4. Grass edge trimmer

A lawn trimmer is a hand-held lawn mower in which the cutting part is a blade that operates in a plane perpendicular to the ground.

### 1.4. Test conditions and results evaluation

Conditions when testing technical regulations and evaluating test results are as prescribed in Appendix 1.

## 2. TECHNICAL REGULATIONS

## 2.1. General requirements

- The machine must have all parts, structures, and operational details according to function; No abnormalities were detected when operating the machine in test modes according to the provisions of this Technical Regulation.
- There is no fluid leakage at joints or connections.
- Machine parts and details are not cracked, broken, punctured, torn or deformed.

## 2.2. Vibrate

The measured vibration value at each handle is not greater than the level specified in Table 1.

**Table 1 - Achieved vibration ( $a_{hv,ed}$ ) values**

Vibration ( $a_{hv,ed}$ )	Engine combustion chamber capacity, $cm^3$	
	$\leq 35$	$> 35$
Vibration acceleration, $m/s^2$	15	7,5

Test method according to Appendix 2.

## 2.3. Noise level

Noise level is determined by the sound pressure level emitted not greater than the level specified in Table 2.

**Table 2 - Acquired negative pressure values**

Negative pressure is achieved	Engine combustion chamber capacity, $cm^3$	
	$\leq 35$	$> 35$
Negative pressure, dB(A)	102	105

Test method according to Appendix 3.

## 2.4. Clutch

The machine must have a clutch to ensure that power is not transmitted to the cutting part when the engine rotates at a speed less than or equal to 1.25 times the engine's lowest idling speed (speed without any impact on the engine). throttle valve control structure to adjust engine speed).

## 2.5. Engine stopping mechanism

The machine must be equipped with a mechanism that can completely stop the motor without maintaining control action.

## 2.6. Cover the cutting part

- Shielding for cutting parts must meet the minimum dimensions specified in TCVN 10877: 2015.

- The durability of the cutting part guard must comply with TCVN 8747: 2011.

### **2.7. Protect against contact with hot parts**

- The hot part of a handheld lawn mower must meet the requirements specified in 4.17 in TCVN 8746:2011.

### **2.8. Impact**

- The lawn mower's engine must be turned off immediately after impact.
- The cutting part with soft cutting wire must not be cut or broken.
- The cutting part must be in solid condition.
- After impact test, the length of flexible cutting wire must be  $(25 \pm 12)$  mm.

Test method according to Appendix 4.

### **2.9. Safety symbol**

**2.9.1.** Safety signs must comply with regulations and must be properly attached to the machine to warn users and people around them of the risk of bodily injury during operation, care and maintenance. nourishment.

**2.9.2.** Safety symbols must be provided on the machine at appropriate locations to prevent hazards: avoid contact with hot parts, impact and splashing.

**2.9.3.** Safety regulations must comply with the regulations in TCVN 8092:2021 (ISO 7010:2019) Graphic symbols – Safety colors and safety signs – Registered safety signs.

## **3. REGULATIONS ON MANAGEMENT**

### **3.1. Specifies the method of assessing conformity**

**3.1.1.** Hand-held lawn mowers used in agriculture and forestry that are new and unused, manufactured or assembled domestically or imported must be certified according to method 5 (testing typical samples combined with process assessment). production; monitoring through testing samples taken at the production site or on the market combined with assessment of the production process) or according to method 7 (testing and evaluating batches of products and goods) specified in Appendix 2 issued together with Circular No. 28/2012/TT-BKHCHN December 12, 2012 of the Minister of Science and Technology.

**3.1.2.** For imported used hand-held lawn mowers, all products and goods must be inspected according to method 8 specified in Appendix 2 issued with Circular No. 28/2012/TT-BKHCHN December 12. /December 2012 of the Minister of Science and Technology.

### **3.2. Regulations on declaration of conformity**

**3.2.1.** The declaration of conformity to regulations is made on the basis of the results of conformity assessment by certification organizations, inspection organizations, and testing laboratories that have registered to operate, are designated or recognized.

**3.2.2.** Certification of conformity by a designated certification organization or a foreign certification organization is mutually recognized for the results of conformity assessment.

### **3.3. Methods of inspection and testing**

Handheld lawn mowers manufactured, assembled and imported must be inspected and tested according to:

- ISO 22867:2021 Forestry and gardening machinery. Vibration test code for portable hand-held machines with internal combustion engine. Vibration at the handles;
- ISO 22868:2021 Forestry and gardening machinery. Noise test code for portable hand-held machines with internal combustion engine. Engineering method (Grade 2 accuracy);
- TCVN 8746:2011 Agricultural and forestry machines - Handheld brush cutters and grass trimmers driven by internal combustion engines - Safety;
- ISO 11806-1:2022 Agricultural and forestry machinery – Safety and testing requirements for hand-held brush cutters and grass trimmers – Part 1: Machines using internal combustion engines.

**3.4. Labeling regulations**

**3.4.1. Request**

- Handheld lawn mowers must have a label attached to the machine in a prominent position, easy to read, indelible and not blurred or damaged by fuel, grease, friction, temperature and humidity. school.
- The label must be clearly written in Vietnamese and must have an additional label for imported handheld lawn mowers.

**3.4.2. Labeling**

The label must have the following minimum information:

- Name of handheld lawn mower;
- Manufacturer's name and address;
- Year of manufacture;
- Handheld lawn mower symbol or type;
- Production series number, if any;
- Dry mass of complete handheld lawn mower, in kg;

**3.5. Sampling method**

The number of test samples depends on the number of machines in a shipment and is specified in Table 3.

**Table 3 – Number of test samples**

<b>TT</b>	<b>Number of machines in the shipment (pcs)</b>	<b>Number of test samples (pcs)</b>
1	From 1 to 100	03
2	Over 100 to 500	06
3	Over 500	10

**4. RESPONSIBILITIES OF ORGANIZATIONS AND INDIVIDUALS**



#### **4.1. Corporate responsibility**

**4.1.1.** Enterprises manufacturing, importing, distributing and trading hand-held lawn mowers must ensure the technical regulations in section 2 and implement the management regulations in section 3 of this Technical Regulation.

**4.1.2.** Before putting hand-held lawn mowers into circulation on the market, businesses must be responsible for affixing the conformity mark to hand-held lawn mowers that have been certified as conformable according to the provisions of this Technical Regulation.

#### **4.2. Responsibilities of the regulation conformity certification organization**

Regulation conformity certification organizations must carry out the responsibilities specified in Decree No. 107/2016/ND-CP.

### **5. IMPLEMENTATION ORGANIZATION**

**5.1.** Department of cooperatives and rural development is responsible for coordinating with relevant authorities to guide and inspect the implementation of this Regulation.

**5.2.** Based on management requirements, Department of cooperatives and rural development responsible for making recommendations The Ministry of Agriculture and Rural Development amends and supplements this Regulation.

**5.3.** In case the documents cited in this regulation are replaced or amended or supplemented, the replaced or amended or supplemented documents shall apply./.

**APPENDIX 1**  
**General rules**  
(Regulations)

**1. Test conditions**

Measuring and testing equipment must be periodically inspected and calibrated according to the provisions of the law on measurement.

**2. Evaluate the test**

The test is considered satisfactory when all test results are passed, when tested on a hand-held lawn mower sample of the batch of goods Table 3.

## APPENDIX 2

### Vibration measurement (Regulations)

#### 1. Measurement conditions

This test applies to all hand-held lawn mowers.

- Measurements are performed on machines with fuel tanks at least half full.
- The engine must be run-in before testing according to the manufacturer's recommendations. Engine temperature must be stable.
- Set the carburetor mode according to the manufacturer's instructions.
- The number of engine revolutions in all test modes is kept constant within the range of  $\pm 3.5$  rpm throughout the test; changes to the initial adjustments are not allowed. If adjustments are necessary, repeat the test after each adjustment.
- The operator has an influence on the vibration value of the machine. Therefore, it is required that the operator must have skills and operate the machine properly.
- The machine must be held by hand so that it does not come into contact with the operator's body during the test.
- Each test mode requires a minimum of 4 measurements, varying the number of engine revolutions (between idle mode, full load mode and full speed mode) between measurements. A stable number of revolutions within  $\pm 3.5$  revolutions/sec must be achieved before the test is continued.
- The total of 4 time intervals corresponding to 4 independent trials is 20 s.

#### 2. Instrumentation

The measuring device is capable of measuring three directions x, y and z simultaneously.

#### 3. Measurement methods

##### 3.1. Measurement location and direction

- Measurement location at each handle of the handheld lawn mower, while the operator holds the machine normally. Measurements are performed simultaneously in three directions x, y and z.
- The center of gravity of the vibration probe must be located at the closest position, a maximum of 20 mm from the edge of the handle.

##### 3.2. Measure and calculate

- Measure vibration acceleration in three directions x, y and z is  $a_{hwx,J}$ ,  $a_{hwy,J}$ ,  $a_{hwz,J}$ , at the left handle and right handle; in 3 operating modes (J): idle mode (Id), full load mode (FI) and full speed mode (Ra).
- Calculate the combined acceleration of the three directions x, y and z is  $a_{hvJ}$  with each operating mode.
- Repeat at least 4 times.
- Calculate the average value of at least 4 trials,  $\bar{a}_{hvJ}$ .

$$\bar{a}_{hvJ} = \frac{1}{n} \sum_{i=1}^n a_{hvJi}$$

In there:

n – number of attempts.

- Calculate the equivalent total vibration value  $a_{hv,ed}$  for each handle. The data are recorded in Table 4.

- Calculate the standard deviation  $S_{n-1}$  and the coefficient of variation  $C_v$ .

$$S_{n-1} = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (a_{hvJi} - \bar{a}_{hvJ})^2}$$

$$C_v = \frac{S_{n-1}}{\bar{a}_{hvJ}}$$

**Table 4 – Measured vibration values in each mode and handle**

Operation mode	Measurement and calculation parameters	Number of operating engine revolutions, rpm	Handle				
			Numerical measurement				
			1	2	3	4	n
Idle mode (Id)	$a_{hv,ld} (m/s^2)$						
	– $a_{hv,ld} (m/s^2)$						
	$S_{n-1} (m/s^2)$						
	$C_v$						
Full load mode	$a_{hv,ld} (m/s^2)$						
	– $a_{hv,ld} (m/s^2)$						
	$S_{n-1} (m/s^2)$						
	$C_v$						
Full speed mode	$a_{hv,ld} (m/s^2)$						
	– $a_{hv,ld} (m/s^2)$						
	$S_{n-1} (m/s^2)$						
	$C_v$						

**4. Number of measurement data**

Measurements are considered valid when:

a) Variation coefficient  $C_v < 0,3$  or

b) Standard deviation  $S_{n-1} < 0,4 m/s^2$ .

- If  $C_v > 0,15$  or if  $S_{n-1} > 0,3 m/s^2$  then must check for errors in measurements before accepting the measurement data.

- If the measured values at each handle and operating mode do not satisfy condition a) or b), repeat the measurements and calculations until one of the two conditions is satisfied.

**APPENDIX 3****The A-weighted sound pressure level emitted at the operator's ear  
(Regulations)****1. Measurement conditions**

This test applies to all hand-held lawn mowers.

- Environmental temperature conditions must be within the limits of  $(-10\div 30)$  °C. Wind speed must be less than 5 m/s. There must be a windscreen for the mic when testing outdoors. The wind speed when tested in the room must not exceed 1 m/s.
- If testing outdoors, there should be a diagram of the machine's location with surrounding objects, including a description of the physical characteristics of the ground surface.
- If testing in a room, there should be a diagram of the machine's location with surrounding objects, describing the physical characteristics of the walls, ceiling and floor.
- The support frame material must satisfy the acoustic properties, avoiding compression of the absorbing material.
- When using artificial substrate:
  - + The artificial ground surface must have a sound absorption coefficient (ISO 354:2003) in accordance with Table 5.

**Table 5 – Absorption coefficient**

<b>Frequency, Hz</b>	<b>The absorbance</b>	<b>Tolerance</b>
125	0,1	$\pm 0,1$
250	0,3	$\pm 0,1$
500	0,5	$\pm 0,1$
1000	0,7	$\pm 0,1$
2000	0,8	$\pm 0,1$
4000	0,9	$\pm 0,1$

- + The artificial base surface must be placed on a hard, reflective surface, in the center of the test area, with dimensions of at least 3.6 m x 3.6 m.
- When using natural substrate:
  - + The ground surface in the center of the test area must be flat and have good sound absorption properties. The surface must be grass or other organic material, with a height of  $(50\pm 20)$  mm.
  - Measurements are performed on a normal machine, equipped in accordance with the user manual.
  - The engine must be run-in before testing according to the manufacturer's recommendations. Engine temperature must be stable.
  - Set the carburetor mode according to the manufacturer's instructions.

- The lawn mower must be lubricated according to the instructions in the user manual.

**2. Instrumentation**

- Sound pressure level measuring equipment with “slow” time-weighting characteristics as defined in TCVN 12527-1:2018 must be used.

- The device for measuring the number of engine revolutions must have an accuracy of ± 1.0% of the reading value. This device does not affect operation during the test.

**3. Method for measuring sound pressure level**

a) Perform at least 4 measurements in each measurement mode (idle mode, full load mode and full speed mode). After changing the engine rpm, make sure the rpm is stable before continuing the test.

- The sum of 4 measurement intervals corresponding to 4 measurements must be at least 20 s.

- The signal duration of each measurement period must be at least 2 s, the number of oscillating motor revolutions is within ± 3.5 revolutions/second.

- Measurement data corresponding to different operating modes of the machine do not necessarily need to be performed sequentially.

b) The measured value fluctuation for each measurement in operating mode does not exceed 2 dB. If exceeded, the test shall be repeated until the result is within 2 dB. The final value is the average value of 4 measurements that satisfy the condition.

**4. Measurement data**

$$L_{pAX} = \overline{L'_{pAX}} - K_{1A}$$

In there:

$L_{pAX}$  - A-weighted sound pressure level, dB;

$K_{1A}$  - Adjustment coefficient, dB (ISO 11201);

$\overline{L'_{pAX}}$  - Average value of measurements, dB.

**Table 6 – A-weighted sound pressure level**

Operation mode	Number of engine revolutions, rpm	A-weighted sound pressure level, $L'_{pA}$ , dB					The average value, $L_{pAX}$ dB	Adjustment coefficient, $K_{1A}$ dB	A-weighted sound pressure level, $L_{pAX}$ dB
		Phép đo số							
		1	2	3	4	n			
Idle mode (Id)									
Full load mode (Fl)									
Full speed mode (Ra)									

## APPENDIX 4

### Test for impact

(Regulations)

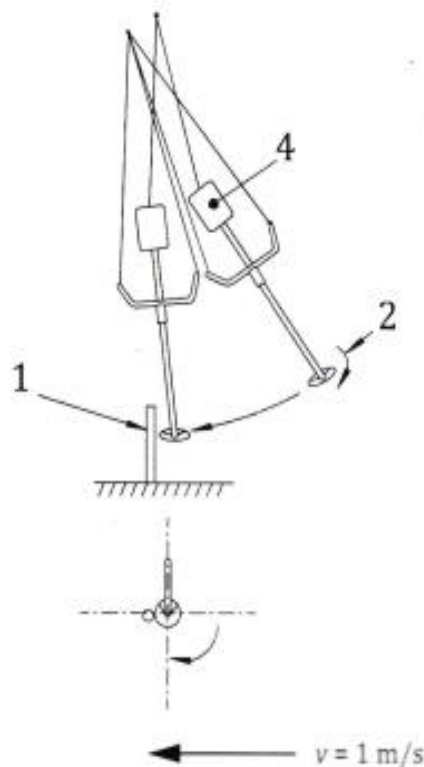
#### 1. Test conditions

This test applies to lawn mowers only.

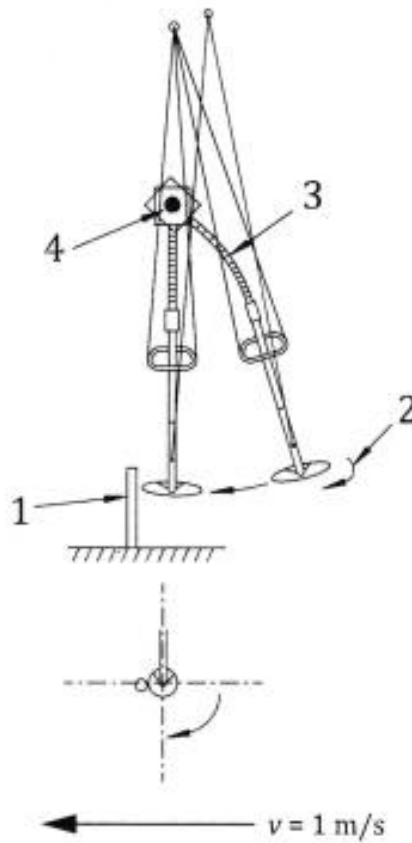
- The machine must be hung freely in the operating position (Figure 1).
- For machines using soft metal cutting wire, the cutting wire has the maximum length recommended by the manufacturer).
- For machines using soft non-metallic cutting wire, the cutting wire must have a length of  $(51 \pm 13)$  mm from the exit position. The coil must be full according to the manufacturer's recommendations.

#### 2. Impact testing equipment

- Machine hanger.
- 9S20 steel pipe has a diameter of  $(25 \pm 1)$  mm, fixedly installed vertically.



a) The machine uses a rigid transmission



**b) The machine uses soft transmission**

**NOTES:**

- 1 Steel bar
- 2 Direction of rotation
- 3 Soft shafts
- 4 Motivation cluster

**Figure 1 – Test for impact**

**3. Impact test method**

- The number of rotations of the cutting part corresponds to the rated number of revolutions of the engine.
- Impact testing is performed only once.
- The cutting part hits the steel pipe horizontally with an approaching speed of  $(1 \pm 0.1)$  m/s.
- After impact, let the cutting unit continue to rotate for 5 minutes at a speed equal to 1.33 times the rated number of revolutions.