SLOVENSKI STANDARD
SIST ISO 6395:2002/AMD 1:2002

01-december-2002

Akustika ï Merjenje zunanjega hrupa, ki ga povzroļ ajo stroji za zemeljska dela ï Dinamiļ ni preskusni pogoji

Acoustics - Measurement of exterior noise emitted by earth-moving machinery - Dynamic test conditions

Acoustique - Mesurage du bruit émis à l'extérieur par les engins de terrassement - Conditions d'essai dynamiques

Ta slovenski standard je istoveten z: ISO 6395:1988/Amd 1:1996

ICS:

17.140.20	Emisija hrupa naprav in opreme	Noise emitted by machines and equipment
53.100	Stroji za zemeljska dela	Earth-moving machinery

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INTERNATIONAL STANDARD

ISO 6395

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AMENDMENT 1
1996-12-15

Acoustics — Measurement of exterior noise emitted by earth-moving machinery — Dynamic test conditions

AMENDMENT 1

Acoustique — Mesurage du bruit émis à l'extérieur par les engins de terrassement — Conditions d'essai dynamiques

AMENDEMENT 1

Reference number
ISO 6395:1988/Amd.1:1996(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Amendment 1 to ISO 6395:1988 was prepared jointly by Technical Committees ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*, and ISO/TC 127, *Earth-moving equipment*.

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Acoustics — Measurement of exterior noise emitted by earth-moving machinery — Dynamic test conditions

AMENDMENT 1

Page 1

0 Introduction

Delete the last sentence of the first paragraph.

3 References

Delete "ISO 4872" (and corresponding footnote) and add reference to:

ISO 3744:1994, *Acoustics — Determination of sound power levels of noise sources using sound pressure — Engineering method in an essentially free field over a reflecting plane.*

4 Definitions

Replace "ISO 4872" by "ISO 3744".

Page 2

6.1 Generality

Replace "ISO 4872" by "ISO 3744".

6.3.1

In the last paragraph, item i), replace "ISO 4872" by "ISO 3744".

Page 3

7.2 Microphone positions on the hemispherical measurement surface

Replace subclause 7.2 by the following:

Six measurement positions shall be used. Microphone positions and their coordinates shall be as shown in figure 5.

7.3.1

Delete "(see ISO 4872)".

Page 4

Figure 5

a) Change numbers "2, 4, 6, 8, 10, 12" to "1, 2, 3, 4, 5, 6".

b) Add the following table of coordinates:

No.	$\frac{x}{r}$	$\frac{y}{r}$	$\frac{z}{m}$
1	0,7	0,7	1,5
2	−0,7	0,7	1,5
3	−0,7	−0,7	1,5
4	0,7	−0,7	1,5
5	−0,27	0,65	0,71 r
6	0,27	−0,65	0,71 r

c) Delete the NOTE.

Page 5

Figure 6

Change microphone numbers "2, 4, 6, 8, 10, 12" to "1, 2, 3, 4, 5, 6".

Page 6

8.2 Number of dynamic cycles

Add at the end:

Guidelines for carrying out the noise measurements are given in annex E.

Page 14

Add the following as annex E.

Annex E
(informative)

Additional guidelines for the measurement of exterior noise emitted by earth-moving machinery — Dynamic test conditions

E.1 Purpose

The guidelines detailed in this annex are to help reduce variations in test cycles by giving specific recommendations in areas that originally were left in an open manner to give the evaluating personnel a reasonable degree of flexibility. These guidelines are intended to provide more explicit instructions to aid the less familiar operator, as a supplement to the test methods specified in ISO 6395:1988.

E.2 Explanations about subclause 9.3, Determination of measurement result

As stated in subclause 7.2, there are six measurement positions. In order to minimize variability during official homologation procedures, six sets of measuring instruments should be used and there should be two test personnel with one machine operator. The minimum arrangement for official homologation should always have at least three sets of instruments and one test personnel and one machine operator. The instrumentation should either be arranged with a multiplex switching or extended cable arrangement so that all meters can be turned off and on simultaneously, or have additional test personnel that match the number of sound level meters being used.

The three measurement positions should be set up so they measure one side of the machine during each cycle element. For the other side of the machine, either the machine may be repositioned or the microphones moved to the other side.

It is imperative that either the machine operator or the instrument-operating person has a simple and understandable hand signal system arranged to signify when the machine is on the test measurement path between the start and stop lines.

It is important to understand that this procedure requires integrating sound level meters or instrumentation with the capability to measure the equivalent continuous A-weighted sound levels. Any other approach that requires multiple individual readings during an element cycle is not an acceptable procedure. Clause 8 is very specific about what data are required to make the final calculations.

The key objective of attaining repeatable readings at each location is to eliminate the need for repeating the whole series of cycle tests if, when the final calculations are made, there is a wide discrepancy in the sound power numbers. The procedure of measuring sound pressures at least three times and resulting in a 1 dB or less spread between two measurements, gives validity to the ability to repeat the tests at another time or on a similar machine and obtaining reasonable results that are comparable.

E.3 Explanations about annex A, Excavators (hydraulic or rope-operated)

A key item to be accomplished before any testing is undertaken is verification that the fluids in the various components have reached a stabilizing temperature for the operating mode presented. It must also be understood that the condition of movement at maximum speed must comply with all safety rules and manufacturers' operating instructions. All of the modes of operation described in these cycles are normal to an excavator's operation as if it were moving materials while digging a trench or working a high wall.

In operating hydraulic circuits, it is important to initially open the control valve slowly and then to full flow position for a portion of the cycle and then back to low flow at the end of the cycle. The actuation of relief valves or contacting mechanical stops or bottoming of cylinders can be avoided once the operator fully understands the cycle and has made several practice cycles.

In order to enhance the repeatability of the noise data, the key positions of the components during the cycle should be marked with either traffic safety cones of approximately 0,5 m height or stakes with flags. Examples are straight out (0° position: *x*-axis), extended positions, 50 % movement position, and 90° left (*y*-axis) in 75 % of the full extension.

It is imperative that the operator be allowed to make several practice cycles before taking the official data. In order to improve the repeatability, timing of the operational elements can give reassurance that the cycles are consistent.

Also, once the tests are under way, the cycles should be repeated within minutes of each other in order to reduce any variability in the test data.

E.4 Explanations about annex B, Tractors with dozer equipment

The recommendations for machine-operating temperature, the timing of operational elements, including travel within the test path, and repeating of cycles within minutes of each other that are specified for excavators also apply to dozers. For fixed gear ratio machines, there should be no problem in repeating the cycles. For hydrostatic machines, the timing of movement over the travel path, ground speed control lock position, or position clamp on ground speed control, can enhance repeatability.

E.5 Explanations about annex C, Loaders

The recommendations for machine-operating temperature, the timing of operational elements, including travel within the test path, hydraulic cycling and repeating of cycles within minutes of each other that are specified for excavators also apply to loaders. For fixed gear ratio machines, there should be no problem in repeating the travel path cycles. For hydrostatic machines, the timing of movement over the travel path, ground speed control lock position, or position clamp on ground speed control, can enhance repeatability.

E.6 Explanations about annex D, Backhoe loaders

The recommendations for excavators and loaders apply to backhoe loaders which need to go through modes of operations specified in the above-mentioned categories.