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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 18490.3-2017

**Safety of machinery -- Laser processing machines -- Part 3: Noise reduction and
noise measurement methods for laser processing machines and hand-held
processing devices and associated auxiliary equipment (accuracy grade 2)**

(English Translation)

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Mechanical safety laser processing machine Part 3: Laser processing machines and hand-held processing machines and Noise reduction and noise measurement methods for related auxiliary equipment (Accuracy level 2)

1 Scope

This part of GB/T 18490 specifies the noise hazards and general requirements for noise reduction of laser processing machines and hand-held laser processing machines and measures, verification of safety requirements for noise reduction and/or protective measures, and procedures for noise testing.

This section applies to laser processing machines and hand-held laser processing machines and their related products within the scope of GB/T 18490.1 and GB/T 18490.2 Noise reduction and noise measurement of auxiliary equipment.

Noise emission characteristics include emission sound pressure level and sound power level at the operating station. The declared noise emission values allow the Comparison of industrial machines and hand-held laser processing machines.

The use of the noise test procedure in Annex A ensures that the determination of the noise emission characteristic values can be reproduced at a specified level of accuracy sex. The noise emission measurement method specified in this section meets the requirements of the engineering law, that is, the accuracy is grade 2.

2 Normative references the following documents are essential for the application of this document. For dated references, only the dated version applies to this article pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 3767 Acoustic sound pressure method-Engineering method for determining sound power level of noise source and sound energy level of approximate free field above reflecting surface (GB/T 3767-2016, ISO 3744:2010, IDT) GB/T 3768 Acoustic sound pressure method - A simple method for measuring the sound power level of noise sources above the reflecting surface using an envelope measuring surface (GB/T 3768-1996, eqvISO 3746.1995) GB/T 3785.1 Electroacoustic Sound Level Meter Part 1: Specification (GB/T 3785.1-2010, IEC 61672-1:2002, IDT) GB/T 14574 Marking and Verification of Noise Emission Values of Acoustic Machinery and Equipment (GB/T 14574-2000, eqvISO 4871.

1996)

GB/T 16404.2 Determination of Sound Power Level of Noise Sources by Acoustic Sound Intensity Method Part 2: Scanning Measurement (GB/T 16404.2-1999, eqvISO 9614-2.1996) GB/T 17248.2 Noise emitted by acoustic machinery and equipment-Measurement of sound pressure levels emitted at working locations and other specified locations Engineering method for approximate free field above a reflecting surface (GB/T 17248.2-1999, eqvISO 11201.1995) GB/T 17248.3 Noise emitted by acoustic machines and equipment-Measurement of sound pressure levels emitted at working locations and other designated locations on-site simple method (GB/T 17248.3-1999, eqvISO 11202.1995) GB/T 17248.4-1998 Noise emitted by acoustic machines and equipment is determined by the sound power level at the working position and other specified positions Set emission sound pressure level (eqvISO 11203.1995) GB/T 17248.5 Noise emitted by acoustic machines and equipment-Measurement of sound pressure levels emitted at working locations and other specified locations Environmental Amendment Law (GB/T 17248.5-1999, eqvISO 11204.1995) GB/T 18490.1 Mechanical Safety Laser Processing Machine Part 1: General Safety Requirements (GB/T 18490.1-2017, ISO/IEC

11553-1:2005, MOD) GB/T 18490.2 Mechanical Safety Laser Processing Machines Part 2: Safety Requirements for Handheld Laser Processing Machines (GB/T 18490.2-2017, ISO/IEC 11553-2:2007, MOD) GB/T 25078.1 Recommendations for the Design and Implementation of Acoustic Low-Noise Machinery and Equipment Part 1: Planning (GB/T 25078.1-2010, ISO/T R11688-1:1995, IDT) EN352-1 General requirements for hearing protectors Part 1: Hearing protectors-General requirements-Part 1: Ear-Muffs)

3 Noise Hazards

Noise from laser processing machines and hand-held laser processing machines can cause.

- a) permanent hearing loss;
- b) tinnitus;
- c) fatigue, tension and headache;
- d) other effects such as imbalance and loss of consciousness;
- e) hinder language communication;
- f) The audible alarm signal cannot be heard.

4 Safety requirements and measures

4.1 General requirements for noise reduction Noise reduction should be an integral part of the design process. According to the recommendations of GB/T 25078.1, special consideration should be given to the noise source.

Noise reduction measures. According to the noise test procedures specified in this part, refer to similar applications of other laser processing machines, and use the actual noise emission value to assess whether noise reduction measures have been successfully applied.

4.2 Measures to reduce noise Appropriate measures should be taken to reduce noise. Special consideration should be given to the following.

- a) Choose a pump with a low noise level instead of sealing the pump;
- b) release aerodynamic energy (in order to save energy, unnecessary emissions should be avoided. Mufflers or exhaust filters should be considered);
- c) Fix pipelines that may vibrate with special fixing structures to reduce the noise generated when these parts move;
- d) Select low-noise fans and other components, or install with elastic support, or use shock absorbers to reduce the generation of laser noise sources;
- e) Adopt damping measures in cooling system and smoke exhaust system;

- f) The operation panel is fixed with reinforcing tape or noise damping material to prevent its vibration and reduce noise radiation;
- g) The noise-generating parts should be kept away from the operator as far as possible;
- h) Enclose the processing area with a closed or semi-closed sound enclosure to limit the noise radiation generated by laser processing from entering the environment.

The above examples are not exhaustive. Other alternative technical measures (with equivalent or higher efficiency) may also be considered to reduce noise.

5 Verification of safety requirements for noise reduction and/or protective measures If the emission sound pressure level is higher than 70dB, the noise emission value should be measured by an appropriate measurement method, and should be given in the user manual Noise Emission Statement.

In order to confirm whether it is necessary to measure according to the noise test procedure of Appendix A, a preliminary test can be carried out first. According to GB/T 3785.1, Preliminary tests can be measured using a more economical Class 2 sound pressure meter, and the measurement conditions are shown in A.9. but not for any environment modification or background Noise correction.

If the A-weighted sound pressure level of the operating station measured under the specified conditions does not exceed 65dB(A), the procedures specified in this part will not be followed at this time.

sequence for further measurements. The noise emission statement should be simply expressed as. emission sound pressure level $L_{pA} \leq 70\text{dB}$.

If the measured emission sound pressure level is greater than 65dB, the noise reduction measures, measurements, verifications and their documentation stated in this section are necessary.

Table 1 presents the method for verifying the safety requirements for the reduction of noise emissions and/or protective measures.

6 User's Instructions the user's instructions for use shall include information on airborne noise emissions, determined and declared in accordance with Appendix A.

- a) The A-weighted emission sound pressure of the operating station should be stated, where it exceeds 70dB(A) and where it does not exceed 70dB(A);
- b) Where the C-weighted peak instantaneous sound pressure value of the operating station exceeds 63Pa (130dB is equivalent to 20μPa);
- c) The A-weighted sound power level emitted by the machine, where the A-weighted emission sound pressure level of the operating station exceeds 80dB(A).

In addition, if further protection is necessary, you should.