

**Manufacturer:**

Columbusmaskiner AB

**Machine Model:**

Columbusmaskiner WNR-STD

**Test Date:**

2024-12-03

**Tested by:**

Alexander Österström & Jari Palosaari

**Test Location:**

Workshop Hejargatan 13, 632 29 Eskilstuna

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**1. Test Equipment**

- Sound Level Meter:

UNI-T 48880

- Test Distance from the Machine:

1 meter from the machine

- Test Position:

The microphone was placed at a height of approximately 1.6 meters from the machine's sound emission, in an open environment without reflections.

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**2. Test Procedure**

- Type of Test:

Idle running test, nut driving, and nut impact performed 10 times.

- Test Duration:

The test was conducted for about 2 minutes of the machine's operation.

- Referenced ISO Standards:

- o EN ISO 3744:2010 – "Acoustics — Determination of sound power levels of noise sources — Engineering methods for an essentially free field over a reflecting plane"

- o EN ISO 11201:2010 – "Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a work station and at other specified positions"

- o EN ISO 11202:2010 – "Acoustics — Noise emitted by machinery and equipment — Determination of emission sound pressure levels at a specified distance from the source"

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**3. Measurement Results**

- Equivalent Continuous A-weighted Sound Pressure Level:

- o Idle running: 55 dB(A)

- o Operating mode: 74 dB(A)

- o (A) is the average of 10 measurements of the equivalent sound pressure level.

- o Each measurement consists of 10 nut drives and 10 impacts over 2 minutes.

- Maximum C-weighted Sound Pressure Level:

115.5 dB was the highest value recorded during the measurement of 10 nut impacts.

- Ambient Sound Level (Background Noise):

Result 45 dB(A)

- Test Conditions:

Indoors, Temperature: 19°C

Measurement Uncertainty: The estimated measurement uncertainty for the recorded sound levels is  $\pm 1.5$  dB(A) according to ISO 3744 and ISO 11201.

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#### 4. Compliance with EU Regulations

- Machinery Directive 2006/42/EC:

According to Machinery Directive 2006/42/EC, Annex I, machines must be designed and built to avoid risks to the user or others. The directive specifies requirements for sound levels to ensure machines do not cause harmful effects on workers' health, particularly with regard to long-term noise exposure.

- o Article 12 of the Machinery Directive requires the machine to meet the essential health and safety requirements, which include sound levels not exceeding dangerous levels.

- o Annex I (Section 1.5.4) states that sound levels must be considered to protect workers' health, meaning that machines must be tested and documented to ensure that sound levels do not exceed specified limits.

- Maximum Allowed Sound Level:

Reference to Relevant EU Standards:

According to EN ISO 3744:2010, the sound level must not exceed 85 dB(A) at a 1-meter distance. This aligns with the requirements in Annex I of the Machinery Directive to protect workers' health.

- Result:

The machine does not exceed the maximum sound levels according to the standards or specifications for this type of machine.

- o In the test at 1 meter distance, the sound level measured was 74 dB(A) in operating mode, which is below the maximum allowed value of 85 dB(A).

- o The maximum C-weighted sound pressure level of 115.5 dB is within acceptable limits for instantaneous sound levels, but it is important to ensure it is not harmful during prolonged exposures.

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#### 5. Summary and Conclusions

- The machine meets the sound level requirements:

Yes, the machine meets the sound level requirements according to EN ISO 3744 and EN ISO 11201. The sound level in operating mode (74 dB(A)) is below the allowed limit of 85 dB(A).

- Other Observations:

No significant sound deviations were observed during the test. The idle running sound level was relatively low (55 dB(A)), and the operating mode sound level (74 dB(A)) is acceptable.

- Recommendations:

No further action is required. The test results are within acceptable limits, and the machine meets the sound requirements for CE marking.

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## 6. **Approval**

- Test Leader (Name, Title)

Jari Palosaari, Test Leader

Date: 2024-12-05

- Responsible for Machine CE Marking

Alexander Österström, Technical Manager

Date: 2024-12-05

Columbusmaskiner AB

Hejargatan 13

632 29 Eskilstuna

Sweden

Email: [info@columbusmaskiner.se](mailto:info@columbusmaskiner.se)

Phone: +46 724 544 244