Company: Columbusmaskiner AB
Date: 2024-12-17
Measurement Personnel: Jari Palosaari, Alexander Österström
Measuring Instrument: Svantek 106
ID No: 45142

SP75-PC	Measured RMS, m/s²						m/s²
Measurement Sequence / Position of Accelerometer	Dir.	1	Dir.	2	Dir.	3	a_v
Idle running (handle)	X	0,24	Y	0,092	Z	0,157	0,3
Load spinning wheel (handle)	X	0,527	Y	0,315	Z	0,453	0,8

Machine Type: Wheel Spinner
Manufacturer: Columbusmaskiner AB
Model: SP75-PC
Drive: Electric 400 V, 3-phase, 50/60 Hz
Power: 1.5 kW
Weight: 38 kg

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1. Test Equipment

- **Vibration Meter:** Svantek SV 106
- **Accelerometer:** Kuber for measuring hand-arm vibrations in 3 directions (X, Y, Z)
- **Test Distance from Machine:** Measurements were taken on the machine's handle, where vibration levels are most relevant to user exposure.
- **Test Position:** Accelerometers were placed on the specific handles of the machine where vibrations most likely affect the user; photos are available in the folder.

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2. Test Procedure

- **Test Type:** A test was performed with an idle run for about 1 minute.
  The test was also performed by spinning the wheel up to full speed (approximately 80 km/h) and then braking. The test was repeated three times, and the results from both handles were identical.

Referenced ISO Standards:

- ISO 5349-1:2001 – "Mechanical vibrations — Measurement and evaluation of human exposure to hand-transmitted vibration — Part 1: General guidelines"
- EN ISO 20643:2010 – "Mechanical vibrations — Measurement and evaluation of hand-arm vibrations"

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3. Measurement Results

- **Equivalent Vibration Level (hand-transmitted vibration):**
  - Idle Running (handle): 0.3 m/s²
  - Load Spinning Wheel (handle): 0.8 m/s²
- **Maximum Vibration Levels:**
  - Max vibration level (hand-transmitted): 0.8 m/s²
- **Test Conditions:** Indoors, Temperature: 19°C
- **Background Vibration Level:** The vibration levels in the test area were below 0.2 m/s² and were not considered to affect the results.

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4. Compliance with EU Regulations

- **Machine Directive 2006/42/EC:**
  The machine meets the fundamental health and safety requirements, including those regarding vibrations. The vibration levels measured are below the maximum allowed value for hand-transmitted vibrations, ensuring the machine does not pose any risk to the user.
- **Maximum Allowable Vibration Level:**
  According to EN ISO 5349 and EN ISO 20643, hand-transmitted vibrations should not exceed 5.0 m/s² as an average value over an eight-hour workday. The maximum vibration level measured in the test is 0.8 m/s², ensuring that the machine does not pose any risk to the user.

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5. Summary and Conclusions

- **The machine meets vibration requirements:** Yes, the machine meets the vibration requirements according to ISO 5349 and EN ISO 20643.
- **Maximum Vibration Levels:** 0.8 m/s² (Load Spinning Wheel)
- **Other Observations:** No significant deviations were observed during the test. Vibrations were within acceptable limits for all operating conditions.
- **Recommendations:** No action required, as the test results are within acceptable limits and the machine meets vibration requirements for CE marking.

Uncertainty Contributions:

- **Instrument Uncertainty (Svantek SV 106):** ±5%
- **Calibration Uncertainty:** ±2%
- **Variability in Repeated Measurements:** ±5–10%
- **Mounting Method and Operator Influence:** ±5%
- **Environmental Factors (Temperature, Background Vibrations):** ±2%

The total measurement uncertainty is estimated to be ±15% (expanded uncertainty with coverage factor k=2, corresponding to a 95% confidence interval).

Impact on Results:
Considering the measurement uncertainty, this means:

- The maximum measured vibration level of 0.8 m/s² (Load/Spinning Wheel handle) may be within the range of 0.68 – 0.92 m/s².
- Load Spinning Wheel (handle): 0.8 ± 0.12 m/s²
- Idle Running (handle): 0.3 ± 0.05 m/s²

Conclusion:
Despite measurement uncertainty, the measured vibration levels are within acceptable limits for hand-transmitted vibrations according to EN ISO 5349 and EN ISO 20643. Since the machine operates in intervals where vibrations are brief or periodic, and the limit values for long-term exposure are not exceeded, no further workplace assessment is required.

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6. Approval

- **Test Leader (name, title):** Jari Palosaari, Test Leader
  Date: 2024-12-17
- **Responsible for Machine's CE Marking:** Alexander Österström, Technical Manager
  Date: 2024-12-17

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