



# Report

Project: **Grinders**  
Subject: **Noise**  
Title: **Measured sound pressure level**  
Client: **Safety Tools Allmet A/S**  
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Approved:	<b>Hilde Løvik</b>	Index Terms:	<b>Noise</b>

Summary:

Averaged A-weighted sound pressure level over a measurement surface in distance 1 m from the grinders has been measured to 80-82 dBA while grinding a 10 mm steel sheet.

Averaged A-weighted sound pressure level over a measurement surface in distance 1 m from the grinders has been measured to 80-82 dBA while grinding a painted scaffolding pipe.

Averaged A-weighted sound pressure level over a measurement surface in distance 1 m from the grinders has been measured to 80-82 dBA while grinding a 10 mm aluminium sheet.

The measurements have been executed outdoors under free-field conditions. By similar measurements indoors, the measuring results will depend upon the room-acoustic conditions in the premises the grinding is being executed. Premises with hard, sound-reflecting surfaces will cause louder sound pressure levels around the grinder than the measured sound values given in this report.

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## **Appendix**

## 1. Introduction

Division of Acoustics at Multiconsult AS in Bergen has carried out measurements of sound pressure levels of three different grinders on request of Safety Tools Allmet A/S by Reidar Olsen.

The measurements were executed on the 7<sup>th</sup> of August 2001 by specialist engineer Ingrid Holst.

## 2. Measuring standard

The measurements of sound pressure levels have been executed and evaluated in accordance with the Norwegian Standard NS-EN ISO 3746 "Determination of sound power levels of noise sources. Survey method using a reference sound source," revision 1996.

## 3. Definitions

$L_{Aeq,T}$ : A-weighted, equivalent sound pressure level. Averaged, A-weighted sound pressure level measured within a given time interval, T.

$L_{Aeq, 8 \text{ hours}}$ : A-weighted, normative, equivalent sound pressure level within a working day corrected for a set reference time interval of 8 hours.

## 4. Requirements

### Off shore

In accordance with the "Norsok Standard Working environment S-002" revision 1997 the noise exposure of an individual worker within a 12 hours working day,  $L_{Aeq, 12 \text{ hours}}$  should be maximum 83 dBA.

### On shore

In accordance with the Norwegian law of the Working environment requirements of noise on the place of work are given in order. No. 398A "Noise in the place of work. Directions with comments." In conference with §6 the limit of  $L_{Aeq, 8 \text{ hours}}$  is 85 dBA.

## 5. Measuring conditions

Background noise was some traffic on bypassing road, but still too low to interfere with the measured values, more than 10 dB below the dominating frequency intervals.

Measuring time interval: from 10.00 to 11.00. No wind, sunlight, scattered cloud cover, + 16 °C.

## 6. Measuring equipment

Following equipment were employed for the measurements:

- Measuring system: Norsonic type 114 with belonging equipment
- Calibrator: Norsonic type 4230

## 7. Measuring procedure

Measuring of equivalent sound pressure level with measuring time interval of 10 seconds in 5 different points were executed. The measuring points were spread over an imaged, surrounding area at a distance of 1 m from the grinders at work. The positions of microphone were at level 1,5 m above the ground around the grinders, and 1 m directly above the grinders, see sketch in appendix 1.

Equivalent sound pressure level were measured in octave band intervals from 31,5 - 8000 Hz. Instrument set-up time constant was FAST. Calibration at 1000 Hz before and after measure periods were OK.

## 8. Sound sources

Sound sources were three different grinders.

Machine 1: WC25-2S (2000 rpm)

Machine 2: WC25-2S (3000 rpm)

Machine 3: WCA105 Coated (7000 rpm) (intended for aluminium)

Pieces of metal tooled by the different grinders were mounted on a working bench placed outdoors at an asphalt-covered area, in sufficient distance from potential reflecting, vertical surfaces. See pictures in appendix 2.

## 9. Measuring results

In table 9.1 averaged A-weighted sound pressure level over a measuring surface at a distance of 1 m from the grinders is summed up. In appendix 3 measuring results at frequency level and results of calculation are shown. Measuring points are shown in appendix 1.

Table 9.1: Measured, corrected sound pressure levels at distance 1 m, free-field conditions

Machine type:	Averaged sound pressure levels at distance 1 m from machine free-field conditions in accordance to NS-EN ISO 3746.	Working process:
WC25-2S (2000 rpm)	80 dBA	Grinding of 10 mm steel sheet (black carbon steel)
WC25-2S (2000 rpm)	75 dBA	Grinding of painted scaffolding pipe
WC25-2S (3000 rpm)	82 dBA	Grinding of 10 mm steel sheet (black carbon steel)
WCA105 Coated (7000 rpm) (intended for aluminium)	85 dBA	Grinding of 10 mm aluminium sheet

**10. Comments**

The measurements have been carried out outdoors under free-field conditions. By similar measurements in doors, the measuring results will depend upon the room-acoustic conditions in the premises the grinding is being executed. Premises with hard, sound-reflecting surfaces will cause louder sound pressure levels around the grinder than the measured sound values given in this report.