



Noise Survey Report

7000 Series Mini-Crusher



Location:

Red Rhino Crushers Ltd.
Alma Park Rd
Grantham
Lincs
NG31 9SE



Commissioned by:

Mr Julian Mik - General Manager
Red Rhino Crushers Ltd.
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Grantham
Lincs
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Survey Date: 14th December 2012

Surveyor: J D Chilvers

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1. Purpose of the Noise Survey

The noise survey was commissioned by Mr Julian Mik, General Manager for Red Rhino Crushers Ltd to investigate the noise levels produced by the 7000 Mini-crusher under non-crushing & crushing conditions.

The Mini crusher 7000 is a diesel powered machine which crushes concrete, bricks and other materials into varying sizes between two plates which are adjustable to vary the size of the resulting rubble.

The survey took place on 14th December 2012 between 13:00 and 15:00.

The measurements were valid on the day and time taken. Different meteorological, environmental, industrial and material conditions may affect the results.



A 7000 Series Mini-crusher

2. Method

All measurements were taken in free field conditions with no buildings or other reflective surfaces within 25m of the 7000 with the exception of the ground which was a solid reflecting surface (brick paviers). There were no other sources of noise.

The sound level meter was field calibrated at 97.4 dB prior to the measurements being taken and then checked at the end of the exercise.

The 7000 was set running at normal operating speed (approx 2/3 max speed) and allowed to reach its' normal operating temperature.

A background noise measurement was taken prior to any noise measurements being taken. Specific measurements were then made in a radius around the 7000 Mini-crusher at 2 metres.

A further measurement was then taken to obtain the noise level generated whilst a crushing a mixture of bricks, concrete and kerb-stones at the operators position by the machine.

Measurement 1 was a background reading.

Measurements 2 – 8 were taken at 2 metres from the 7000 in a hemispherical order.

Measurement 10 was taken at the operator's position next to the controls of the machine whilst mixed materials were being crushed.

The meteorological conditions during the survey were as follows:

Dry (temp 10⁰C), overcast and light breeze (1m/s).

3. Summary of Results

General Summary

The results obtained from the measurements are as follows:

Background noise level 53.6dB(A) (measured)

Measurements taken at 2.0 metres from the 7000 produced noise levels of 89.5dB(A) to 94.7 dB(A).

Position	Sound level dB(A)
1	93.8
2	95.5
3	93.7
4	97.7
5	94.9
6	92.4
7	91.2
8	89.5
Average	94.3

The measurement taken at the operators position at the controls of the machine produced a level of **98.1dB(A)** whilst crushing mixed material.

The sound power level of the machine = **108.6 dB(A)**

4. Conclusions / Recommendations for Action

The noise level at the operators position at the controls of the machine is in excess of the second action level of 85 dB(A) which under the Control of Noise at Work Regulations 2005 action levels requires that hearing protection must be worn (operators of the machine should conduct their own noise exposure risk assessment to determine the risk to anyone operating the machine).

The levels of noise in excess of 80dB(A) produced extend beyond the 2m boundary and so all persons working within the 5m boundary should wear hearing protection.

Different materials may produce greater levels of noise and so if there is any doubt about the noise levels, hearing protection should be worn and further measurements should be taken to determine the levels.

Warning signs or labels should be applied to all machines stating that hearing protection must be worn whilst in use even if not crushing. An example is shown below.



5. Glossary

Ambient Noise The noise level produced by the noise source in question Residual

Noise The noise level produced without the noise source in operation Specific

Noise The noise level with the residual noise removed from the Ambient noise.

A Weighting A standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

C Weighting A standard weighting of the audible frequencies used for the measurement of Peak Sound Pressure Level.

dB(A) Decibels A weighted

dB(C) Decibels C weighted

Decibel (dB) The units of sound level and noise exposure measurement.

$L_{EP,d}$ Daily personal noise exposure

L_{10} The A weighted level of noise exceeded for 10% of the specified measurement period (T). It is an indication of the upper limit of fluctuating noise.

L_{90} The A weighted level of noise exceeded for 90% of the specified measurement period (T). In BS4142-1997 it is used to define background noise level.

$L_{Aeq,T}$ Equivalent sound pressure level. A measure of the average sound pressure level during a period of time, t, in dB.

L_{AE} Sound Exposure Level (SEL) with 'A' frequency weighting.

L_{ASmax} The maximum sound level with 'A' Frequency weighting and Slow Time weighting.

Peak The maximum value reached by the sound pressure at any instant during a measurement period (in dB usually with a C frequency weighting).

Octave Band A division of the frequency range into bands, the upper frequency limit of each band being twice the lower frequency limit. The width of the octave band increases at higher frequencies.

NEC Noise Exposure Category

PPE Personal Protective Equipment

SEL Sound Exposure Level

Equipment List

Norsonic 118 Sound Analyser

Cirrus CR511E Calibrator

References

Control of Noise at Work Regulations 2005

L108 – Reducing Noise At Work (Guidance on the Noise at work Regulations 2005)

Health & Safety at Work Act 1974

Management of Health and Safety at Work Regulations 1999