

UNLOADED SOUND TEST SUMMARY SHEET

| | |
|---|---------------------------------------|
| NAME OF DEVICE UNDER TEST (DUT) | Grinder |
| TOOL OPERATOR | Unloaded |
| COMPUTER OPERATOR | Brian Kim, Ed Zechmann |
| TEST DATE | 5/7/2009 |
| TEST DESCRIPTION | Sound Power Level Measurement |
| TEST LOCATION | UC anechoic lab |
| MANUFACTURER | Skil |
| MODEL | 9290-01 |
| SERIAL NUMBER | E181135 |
| MODE OF OPERATION | FULL SPEED, UNLOADED |
| RUN NUMBER | 1 |
| YEAR MADE | 2008 |
| DIMENSIONS (inches) | Length 10.5", Width 2.5", Height 5.0" |
| WEIGHT (lbs.) | 4.9 |
| TECHNICAL SPECIFICATIONS | 4 1/2 inch angle grinder |
| MOUNTING CONDITIONS | free-free, bungy cords |
| LOADING CONDITIONS | Full speed no load |
| K1 (dBA) | 0 |
| K2 (dBA) | 0.08 |
| TEMPERATURE (CELSIUS) | 24 |
| HUMIDITY % | 42 |
| BAROMETRIC PRESSURE ("Hg) | 29.87 |
| TEST ENVIRONMENT | SEMI ANECHOIC, SEMI HEMISPHERICAL |
| TOOL TESTING STANDARD | ANSI S12.15-1992 |
| MEASUREMENT STANDARD | ISO 3744:1994-05-01 |
| MICROPHONE SET-UP | 10-MICROPHONES |
| SURFACE RADIUS | 2.00 meters |
| RATED POWER (WATTS) | 720 |
| ACTUAL INPUT POWER (WATTS) | 371 |
| VOLTAGE (VOLTS) | 119 |
| CURRENT (AMPS) | 3.3 |
| RATED RPM | 11000 |
| ACTUAL RPM | - |
| SOUND POWER LEVEL (dBA) | 102.2 |
| SOUND POWER (WATTS) A-weighted | 0.01663 |
| SWLA - k2 (dBA) | 102.1 |
| SWLA - k2 (WATTS) A-weighted | 0.01633 |
| SOUND PRESSURE LEVEL (dBA) @ 2 meters | 88.2 |
| AT THE NOMINAL HEARING ZONE OF OPERATOR | |
| SOUND PRESSURE LEVEL (dBA) | 96.2 |

Average Directivity Study

| | |
|---------------|----------------------|
| TEST DATE | 5/7/2009 |
| DUT | Grinder |
| Manufacturer | Skil |
| Model Number | 9290-01 |
| Serial Number | E181135 |
| Mode | FULL SPEED, UNLOADED |
| Run Number | 1 |

A-weighted Sound Pressure Level

| Mic # | Position1 dBA |
|-------|------------------|
| 0 | 87.7 |
| 1 | 86.3 |
| 2 | 88.4 |
| 3 | 87.9 |
| 4 | 88.2 |
| 5 | 89.8 |
| 6 | 88.0 |
| 7 | 89.1 |
| 8 | 87.6 |
| 9 | 88.3 |
| 10 | 96.2 |

| | |
|---------------|-----|
| dB difference | 3.5 |
|---------------|-----|

A-weighted Directivity Index

| Mic # | dBA |
|-------|------|
| 0 | -0.4 |
| 1 | -1.8 |
| 2 | 0.3 |
| 3 | -0.2 |
| 4 | 0.0 |
| 5 | 1.6 |
| 6 | -0.2 |
| 7 | 1.0 |
| 8 | -0.6 |
| 9 | 0.1 |

SOUND DATA SHEET

PRODUCT INFORMATION

TEST DATE 5/7/2009
DUT Grinder
Manufacturer Skil
Model Number 9290-01
Serial Number E181135
Mode of Operation FULL SPEED, UNLOADED
Run Number 1

TEST CONDITIONS

Actual Power (watt) 371
Voltage (Volts) 119
Current (Amps) 3.3
Actual RPM -
Temperature (Deg. F) 24
Humidity (%) 42
Baro. Press. (inch of Hg) 29.87

Measurement Data

Linear (unweighted) Position 1

| | | | | | |
|---------------------|---------|---------|---------|---------|---------|
| Sound Power (dB) | 101.82 | 101.83 | 101.77 | 101.67 | 101.70 |
| Sound Power (Watts) | 0.01522 | 0.01522 | 0.01503 | 0.01470 | 0.01478 |
| Sound Pressure (dB) | 87.82 | 87.82 | 87.77 | 87.67 | 87.69 |

A-weighted Position 1

| | | | | | |
|----------------------|---------|---------|---------|---------|---------|
| Sound Power (dBA) | 102.29 | 102.29 | 102.23 | 102.10 | 102.14 |
| Sound Power (Watts) | 0.01693 | 0.01693 | 0.01672 | 0.01620 | 0.01639 |
| Sound Pressure (dBA) | 88.28 | 88.28 | 88.23 | 88.09 | 88.14 |

Calculations

Average A-weighted Sound Data

| | |
|----------------------|--------|
| Sound Power (dBA) | 102.21 |
| Sound Power (Watts) | 0.0166 |
| Sound Pressure (dBA) | 88.21 |

Std. Deviation SWLA 0.0857

95 % Confidence Level 0.1064

Mean SPLA-k2 88.13

UNLOADED VIBRATIONS TEST SUMMARY SHEET

NAME OF DEVICE UNDER TEST (DUT)
TOOL OPERATOR (SUBJECT OF TEST)
COMPUTER OPERATOR
TEST DATE

Grinder
Unloaded
Brian Kim, Ed Zechmann
5/7/2009

TEST DESCRIPTION
TEST LOCATION
MANUFACTURER
MODEL
SERIAL NUMBER
MODE OF OPERATION
RUN NUMBER
YEAR MADE
DIMENSIONS (inches)
WEIGHT (lbs.)
TECHNICAL SPECIFICATIONS
MOUNTING CONDITIONS
LOADING CONDITIONS
TEMPERATURE (CELSIUS)
HUMIDITY %
BAROMETRIC PRESSURE ("Hg)

Human Exposure to Vibrations
UC ANECHOIC LAB
Skil
9290-01
E181135
FULL SPEED, UNLOADED
1
2008
Length 10.5", Width 2.5", Height 5.0"
4.9
4 1/2 inch angle grinder
free-free, bungy cords
Full speed no load
24
42
29.87

TEST ENVIRONMENT
MEASUREMENT STANDARD
ACCELEROMETER SETUP
SETUP DIAGRAM
LOCATION ACCEL 1
ORIENTATION ACCEL 1
LOCATION ACCEL 2
ORIENTATION ACCEL 2
ADAPTER TYPE
OPERATOR PRESSURE
HAND GRIP FORCE

SEMI ANECHOIC, SEMI HEMISPHERICAL
ISO 5349-1 and ISO 5349-2
2 - ACCELEROMETERS
grinder_6_sv_accel_setup.doc
right hand, top of tool, near back of tool
X toward right side of tool, Y toward grinder wheel, Z toward top of tool
left hand, left grip, on top of side handle
X toward grinder wheel, Y toward left side of tool, Z toward top of tool
Accel 1-side adapter, Accel 2-side adapter
-
Band clamp over rubber mechanical low-pass filter

RATED POWER (WATTS)
ACTUAL INPUT POWER (WATTS)
VOLTAGE (VOLTS)
CURRENT (AMPS)
RATED RPM
ACTUAL RPM

720
371
119
3.25
11000
-

Vibrations

Accelerometer 1

X, Y, Z arms m/s^2 weighted
X, Y, Z arms m/s^2 linear
Total arms m/s^2 (weighted, linear)

2.4, 1.9, 2.5
38.4, 60, 67.8
4, 98.4

Accelerometer 2

X, Y, Z arms m/s^2 weighted
X, Y, Z arms m/s^2 linear
Total arms m/s^2 (weighted, linear)

3.4, 1.9, 4.7
49.1, 43, 51.8
6.1, 83.5

VIBRATIONS DATA SHEET

| | | | | |
|-------------------|----------------------|---------------------|-----|--|
| TEST DATE | 5/7/2009 | | | |
| DUT | Grinder | Actual Power (watt) | 371 | |
| Manufacturer | Skil | Voltage (Volts) | 119 | |
| Model Number | 9290-01 | Current (Amps) | 3.3 | |
| Serial Number | E181135 | Actual RPM | - | |
| Mode of Operation | FULL SPEED, UNLOADED | Temperature | 24 | |
| Run Number | 1 | Humidity (%) | 42 | |

| | | | | | |
|-----------------|--------------------------------|-----|-----|-----|-----|
| Accelerometer 1 | arms weighted m/s ² | | | | |
| Axis | 1 | 2 | 3 | 4 | 5 |
| X | 2.1 | 2.1 | 2.1 | 2.9 | 2.9 |
| Y | 2.0 | 2.0 | 2.0 | 1.9 | 1.7 |
| Z | 2.4 | 2.4 | 2.4 | 2.6 | 2.6 |
| Total arms | 3.8 | 3.8 | 3.8 | 4.3 | 4.2 |

| | | | | | |
|-----------------|------------------------------|------|------|-------|------|
| Accelerometer 1 | arms linear m/s ² | | | | |
| X | 34.9 | 35.4 | 35.3 | 42.1 | 44.2 |
| Y | 60.0 | 60.2 | 60.2 | 62.0 | 57.6 |
| Z | 68.2 | 68.5 | 68.3 | 68.1 | 65.8 |
| Total arms | 97.3 | 97.8 | 97.7 | 101.3 | 98.0 |

| | | | | | |
|-----------------|--------------------------------|-----|-----|-----|-----|
| Accelerometer 2 | arms weighted m/s ² | | | | |
| Axis | 1 | 2 | 3 | 4 | 5 |
| X | 3.0 | 3.0 | 3.0 | 4.0 | 3.9 |
| Y | 1.6 | 1.6 | 1.6 | 2.2 | 2.6 |
| Z | 3.7 | 3.7 | 3.8 | 5.9 | 6.4 |
| Total arms | 5.1 | 5.1 | 5.1 | 7.5 | 7.9 |

| | | | | | |
|-----------------|------------------------------|------|------|------|-------|
| Accelerometer 2 | arms linear m/s ² | | | | |
| X | 45.6 | 45.9 | 46.1 | 55.0 | 53.1 |
| Y | 37.5 | 37.6 | 37.9 | 48.5 | 53.6 |
| Z | 42.0 | 42.2 | 42.5 | 62.8 | 69.2 |
| Total arms | 72.5 | 72.8 | 73.3 | 96.6 | 102.4 |

| | | | | | |
|-----------------------------|---------|---------|--------|---------|---------|
| Average arms | | | | | |
| Weighted m/s ² | Accel 1 | Accel 2 | Linear | Accel 1 | Accel 2 |
| X | 2.4 | 3.4 | X | 38.4 | 49.1 |
| Y | 1.9 | 1.9 | Y | 60.0 | 43.0 |
| Z | 2.5 | 4.7 | Z | 67.8 | 51.8 |
| Total arms m/s ² | 4.0 | 6.1 | | 98.4 | 83.5 |
| Std. Deviation | 0.3 | 1.4 | | 1.6 | 14.7 |
| 95 % Confidence Level | 0.3 | 1.8 | | 2.0 | 18.3 |