Powermax G3 series (1000, 1250, 1650) – Plasma Cutting System Acoustic Noise Level Measurements

Cutting with a plasma arc can exceed acceptable noise levels as defined by local codes in many applications. Prolonged exposure to excessive noise will damage hearing. Always wear proper ear protection when cutting or gouging, unless sound pressure level measurements taken at the installed site have verified personal hearing protection is not necessary. See also "***Noise Can Damage Hearing****"* in the *Safety* section of the operator manual.

> ***Notes for Machinery Designers and Manufacturers:***
> All relevant international, regional, national and local codes must be considered and adhered to as appropriate, in particular if introducing this plasma power source and torch as part of a machine/mechanized solution.
>
> If incorporating this plasma arc cutting equipment as part of a mechanized cutting machine, a hierarchy of noise control should be adopted based primarily on elimination or control of noise 'at source' as part of the machine design in order to protect people who operate within the workplace or who may enter the workplace at any given time.

Metal cutting is noisy, using a plasma arc to cut metal is no exception. The noise measurements taken by Hypertherm are intended to provide a worst case indication of maximum potential sound pressure levels 1 meter from the plasma arc without the benefit of any noise controls in the design or operation of cutting machines. The A-weighted sound pressure level was taken during a short duration of 1 minute of continuous cutting. Actual values measured in typical cutting applications for longer durations may be much lower . Shield the plasma arc where practical. Significant engineering design improvements can be obtained by adding simple engineering controls to cutting tables such as barriers or curtains positioned between the plasma arc and the workstation; and/or locating the workstation more than 1 meter away from the plasma arc. Customers can also implement additional administrative controls in the workplace to restrict access, limit operator exposure time or screen off noisy working areas or take measures to reduce reverberation in working areas by putting up noise absorbers.

During cutting table design and/or customer site preparation, an assessment should be made to see whether the cutting table, process or production set-up can be modified to reduce the noise levels. If the noise level is questionable, have a certified safety specialist or Industrial Hygienist take measurements and make recommendations. If engineering and administrative control methods fail to reduce noise to acceptable levels, in some countries local workplace regulations may require a Hearing Conservation Program (e.g. in the USA OSHA requires a Hearing Conservation Program if noise levels reach 85 dB on an 8-hour, Time Weighted Average (TWA) basis).

Use ear protectors if the noise is disruptive or if there is a risk of hearing damage after all other engineering and administrative controls have been implemented. If hearing protection is required, wear only approved personal protective devices such as ear muffs or ear plugs with a noise reduction rating appropriate for the situation. In addition, ear protection can prevent hot spatter from entering the ear. Warn others in area of possible noise hazards. If the noise in your work area becomes uncomfortable, causing a headache or discomfort of the ears, you could be damaging your hearing and should immediately put on ear muffs or plugs.

Sound Pressure measurements taken in Hypertherm Research & Development Labs

PRODUCT	Output current (typical or worse case)	Process	Measurement Distance From Source	peak C-weighted instantaneous sound pressure (L_{pCpeak} in dB) MaxP	A-weighted sound pressure (L_{pA} in dB) Lav5	Table Type and Water Level if Wet (workpiece above/below water)	Workpiece material & thickness	Date measurement taken
Powermax 1000	59.5A	Air (65 psi)	39.4" from front of arc 13.4" above arc	110.5	104.8	Wet, 7" above water	0.5" mild steel at 12ipm	16 Feb 2010
Powermax 1000	59.5A	Air (65 psi)	78.7" from front of arc 13.4" above arc	96.6	91.1	Wet, 7" above water	0.5" mild steel at 12ipm	16 Feb 2010
Powermax 1250 machine torch	40A	Air	39.4" away from arc, 12" above arc	110.8	90.2	Dry. hand cutting	0.25 inch mild steel at 12ipm rate	15 Sep 2009
Powermax 1250 machine torch	50A	Air	39.4" away from arc, 12" above arc	114.6	91.9	Dry. hand cutting	0.25 inch mild steel at 12ipm rate	15 Sep 2009
Powermax 1250	80.2A	Air (70 psi)	39.4" from front of arc 13.4" above arc	111.6	106.0	Wet, 7" above water	0.625" mild steel at 12ipm	16 Feb 2010

PRODUCT	Output current (typical or worse case)	Process	Measurement Distance From Source	peak C-weighted instantaneous sound pressure (L_{pCpeak} in dB) MaxP	A-weighted sound pressure (L_{pA} in dB) Lav5	Table Type and Water Level if Wet (workpiece above/below water)	Workpiece material & thickness	Date measurement taken
Powermax 1250	80.2A	Air (70 psi)	78.7" from front of arc 13.4" above arc	96.7	92.6	Wet, 7" above water	0.625" mild steel at 12ipm	16 Feb 2010
Powermax 1650	100A	Air (80psi)	39.4" from front of arc 13.4" above arc	113.2	100.1	Wet, 8.25" above water	NS[1]	11 Nov 2003[1]
Powermax 1650	60A	Air (72 psi)	39.4" from front of arc 13.4" above arc	110.1	94.7	Wet, 8.25" above water	NS[1]	11 Nov 2003[1]
Powermax 1650	80A	Air (72 psi)	39.4" from front of arc 13.4" above arc	112.5	99.2	Wet, 8.25" above water	NS[1]	11 Nov 2003[1]
Powermax 1650	100A	Air (75 psi)	39.4" from front of arc 13.4" above arc	113.3	109.9	Wet, 7" above water	0.750" mild steel at 12ipm	16 Feb 2010
Powermax 1650	100A	Air (75 psi)	78.7" from front of arc 13.4" above arc	99.5	96.6	Wet, 7" above water	0.750" mild steel at 12ipm	16 Feb 2010

[1] NS = information not specified in original test report.

Revision	Date	Section	History Change
1	20-Apr-2010	-	Initial Release