

HyPrecision 60S – Waterjet Cutting System

Acoustic Noise Level Measurements

Cutting with high pressure waterjet 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 waterjet cutting, unless sound pressure level measurements taken at the installed site have verified personal hearing protection is not necessary.

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 the waterjet intensifier pump and waterjet cutting head as part of a machine/mechanized solution.

If incorporating this waterjet 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.

Waterjet cutting is noisy, using high pressure water with or without an abrasive material to cut metal and other materials 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 waterjet cutting head and intensifier pump 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 waterjet cutting head 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 waterjet cutting head and the workstation; and/or locating the workstation more than 1 meter away from the waterjet cutting head and intensifier pump. 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. 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 pressure (typical or worse case)	Process	Measurement Distance From Waterjet Pump/High pressure cutting head	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
HyPrecision 60S	60,000 psi	Ambient	Front, 1 meter from cutting head, 13.25” above cutting surface	89.1	73.4	-	-	March 19, 2014
HyPrecision 60S	60,000 psi	Cutting	Front, 1 meter from cutting head, 13.25” above cutting surface	109.0	88.5	Wet, ~1” below	¾” mild steel	March 19, 2014
HyPrecision 60S	60,000 psi	Ambient	Left side, 3.4 meter from cutting head, 17” above cutting surface	89.0	73.0	-	-	March 19, 2014
HyPrecision 60S	60,000 psi	Cutting	Left side, 3.4 meters from cutting head, 17” above cutting surface	101.2	82.2	Wet, ~1” below	¾” mild steel	March 19, 2014
HyPrecision 60S	60,000 psi	Ambient	Right side, 2 meter from cutting head, 17” above cutting surface	93.3	76.8	-	-	March 19, 2014

PRODUCT	Output pressure (typical or worse case)	Process	Measurement Distance From Waterjet Pump/High pressure cutting head	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
HyPrecision 60S	60,000 psi	Cutting	Right side, 2 meter from cutting head, 17" above cutting surface	105.6	84.8	Wet, ~1" below	3/4" mild steel	March 19, 2014
HyPrecision 60S	60,000 psi	Ambient	Front, 1.5 meter from floor, 1 meter from waterjet pump	97.1	79.7	-	-	March 19, 2014
HyPrecision 60S	60,000 psi	Cutting	Front, 1.5 meter from floor, 1 meter from waterjet pump	97.2	80.2	Wet, ~1" below	3/4" mild steel	March 19, 2014
HyPrecision 60S	60,000 psi	Ambient	Left side, 1.5 meter from floor, 1 meter from waterjet pump	97.7	83.8	-	-	March 19, 2014
HyPrecision 60S	60,000 psi	Cutting	Left side, 1.5 meter from floor, 1 meter from waterjet pump	98.6	84.4	Wet, ~1" below	3/4" mild steel	March 19, 2014
HyPrecision 60S	60,000 psi	Ambient	Right side, 1.5 meter from floor, 1 meter from waterjet pump	98.0	82.2	-	-	March 19, 2014
HyPrecision 60S	60,000 psi	Cutting	Right side, 1.5 meter from floor, 1 meter from waterjet pump	98.5	82.3	Wet, ~1" below	3/4" mild steel	March 19, 2014

Revision	Date	Section	History Change
1	Feb. 3, 2015	-	Initial Release