

HYTORC

The World's Most Trusted Industrial Bolting Systems

Take the Worry Out of Hand-Arm Vibration Safety

HYTORC POWER TORQUE TOOL VIBRATION SAFETY



HYTORC Power Torque Tools with torque multipliers lead the industry in vibration safety for heavy bolting applications. Operators still using impact wrenches on bolting projects worry that those tools place the workforce at high risk of Hand-Arm Vibration (HAV) injury. Users in the transportation, steel fabrication, construction and many other industries are discovering the hassles of administratively controlling, monitoring and limiting vibration exposure to impact wrenches is just not worth it when safer solutions are available. Newer electric and pneumatic powered torque tools with efficient torque multipliers deliver ten-times lower hand and arm vibration than impact wrenches and still get the job done efficiently. All HYTORC Power Torque Tools provide smooth and quiet operation, transfer low vibration and are safer for the operator even under extended use.

ENHANCED VIBRATION SAFETY



Exposure to high vibration power tools such as impact wrenches increases the risk of an injury known as Hand-Arm Vibration Syndrome (HAVS). HYTORC Power Torque tools with torque multipliers expose the operator to less vibration than impact wrenches, enhancing overall hand-arm safety of the workforce.

LOW VIBRATION ELECTRIC TOOLS



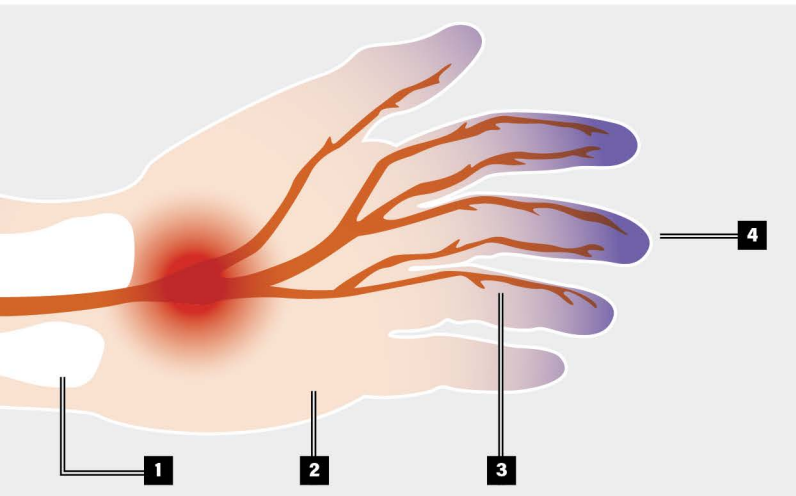
HYTORC Electric Torque Tools provide the ultimate in portability with efficient motor operation and smooth quiet gearbox. The Electric Tools are designed for optimal ergonomics with high torque yet with smooth operation reducing vibration across all torque sizes.

LOW VIBRATION PNEUMATIC TOOLS



All HYTORC Pneumatic Torque Tools are designed with highly efficient and smooth torque multipliers that transfer lower vibration than other tools. All of these tools deliver higher performance with workforce safety in mind by exposing the bolting operator to lower vibration.

RISK, RESPONSIBILITY, AND THE INDUSTRY STANDARD



1. Temporary or permanent pain and loss of use of hands or arms.
2. Muscle fatigue and weakness causes reduced mobility in the fingers, hand or arm.
3. Damage to the blood vessels causes pain and discoloration.
4. Damage to nerves causes numbness and tingling.

RISK AND RESPONSIBILITY

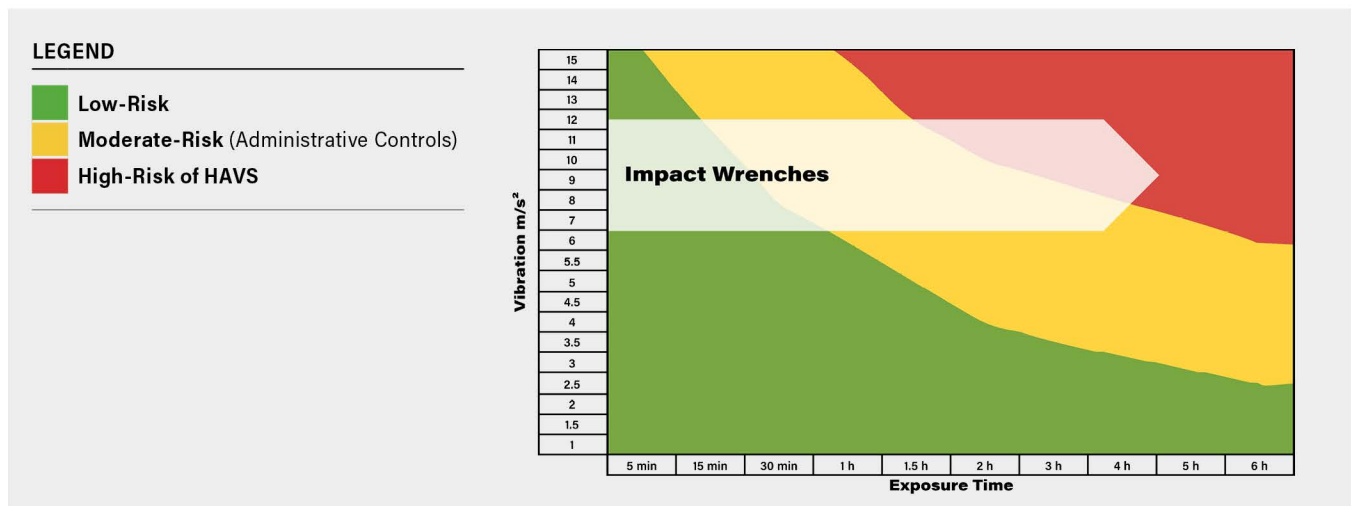
It is well established that exposure to high magnitude vibration power tools will increase the risk of a debilitating injury known as Hand-Arm Vibration Syndrome (HAVS). This injury causes damage to nerves, blood vessels, muscles, and joints in the hands and arms. This injury may occur within a year or two of exposure or show up years later. Severe cases are irreversible and permanent. Employers across the world have a responsibility to be aware of the hazard and protect the workforce from this risk of injury.

INDUSTRY STANDARD

Government safety and health organizations have established the current standard Hand Arm Vibration (HAV) exposure limit (European Standard Directive 2002/44/EC) in a daily (8 hour) Exposure Action Value (EAV) of 2.5 m/s². In Europe this is a law that must be followed by employers. Any tool with a declared vibration value greater enters a higher risk category and will require action on the part of the employer to limit the risk of injury. A worker who is exposed to vibration above a daily Exposure Limit Value (ELV) of 5 m/s² is at high risk of developing HAVS.

CALCULATING THE RISK OF IMPACT WRENCHES

Employers conduct risk evaluation across a spectrum of scenarios by combining the tool vibration intensity with the exposure duration, where exposure is the actual "trigger-time" of an operator using the tool. Risk is calculated and categorized as low, moderate or high as shown in the diagram below. High vibration tools such as impact wrenches, if used frequently, quickly become a moderate or high-risk of HAVS injury. Most all impact wrenches exceed the industry standard Exposure Action Value (EAV) limit of 2.5 m/s². Most impact wrenches also exceed the Exposure Limit Value (ELV) of 5 m/s² meaning a high risk of developing HAVS. Reliable sources [1] of tool vibration data characterize impact wrench vibration at 7-to-11 m/s² during typical job use.



[1] HSE Health and Safety - <https://www.hse.gov.uk/vibration/hav/source-vibration-magnitude-app3.pdf>

TORQUE-MULTIPLIERS VS. IMPACT WRENCHES

ADMINISTRATIVE CONTROLS

Exposure to vibration from moderate and high-risk tools like impact wrenches usually must be reduced through administrative controls. This may include rotating employees or limiting minutes of use. The National Institute of Occupational Health and Safety (NIOSH) recommends limiting the number of hours and days per week an employee must use a high vibrating hand tool. NIOSH suggests limiting its use to 10-minute operating cycles, totaling no more than two hours per day and no more than two consecutive days a week. Administrative controls also include monitoring the condition of the tool and the health of the workers. Many operators are discovering that administrative controls are difficult to manage, slowing jobs and still putting workers at risk.

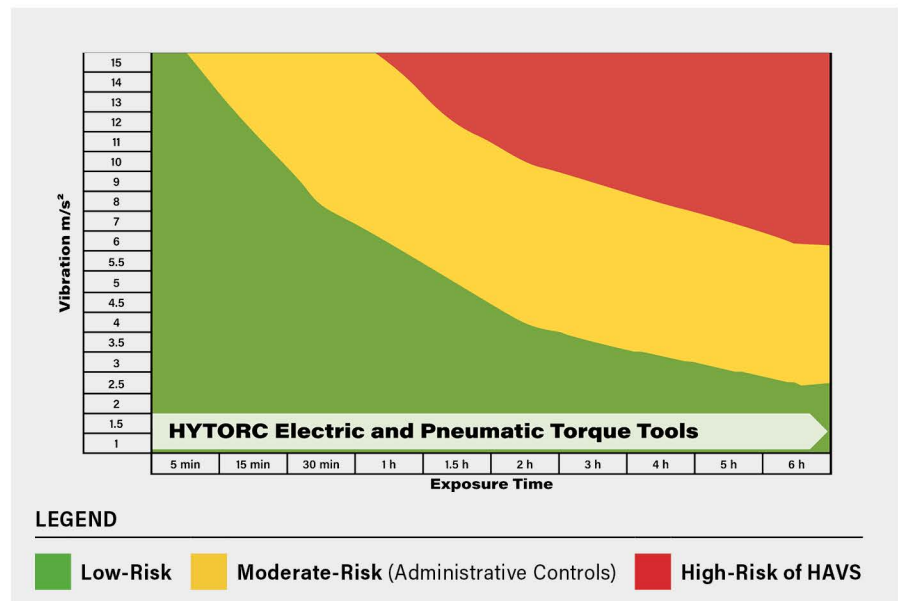
POWER TORQUE TOOLS WITH TORQUE-MULTIPLIERS HAVE 10X LESS VIBRATION EXPOSURE THAN IMPACT WRENCHES

“THE NUMBER OF VIBRATION EXPOSURE POINTS INCURRED FROM USE OF A TORQUE MULTIPLIER WHEN PROCESSING 100 NUTS IS APPROXIMATELY TEN TIMES LOWER THAN WOULD BE INCURRED WITH AN IMPACT WRENCH.”

Vibration Measurements of Torque Multipliers, Research Report Conducted by HSE RR 794. 2010

SELECT POWER TORQUE TOOLS WITH TORQUE-MULTIPLIERS

When planning repetitive bolting operations, low-vibration power torque tools with torque multipliers such as HYTORC Electric and Pneumatic Torque Tools are recommended to minimize risk. All of these tools have vibration exposure that is ten times less than impact bolting tools. These tools are certified with declared vibration less than the Exposure Action Value (EAV) of 2.5 m/s². As shown in the diagram below Torque tools such as the HYTORC Electric and Pneumatic Tools have measured vibration values less than 1.5 m/s². These tools can be used by an operator on a bolting job for an entire day while remaining in the “low risk” category and without concern of HAV injury.



WHAT ABOUT ANTI-VIBRATION GLOVES?



A NIOSH study found some Anti-Vibration Gloves (AVGs) can reduce the intensity of vibration to the hand. Effectiveness is “highly dependent” on the tool vibration frequency and the amount of exposure. NIOSH concluded that AVGs cannot be relied upon alone to provide sufficient protection against HAV injury. Despite limitations that AVGs offer, gloves are still recommended PPE when using high vibration tools to keep hands warm and dry and to protect against cuts, abrasions and job hazards.

HYTORC POWER TORQUE TOOLS AND VIBRATION SUMMARY

HYTORC LOW-VIBRATION ELECTRIC AND PNEUMATIC TORQUE TOOLS

HYTORC Electric and Pneumatic Torque Tools have been designed to optimize ergonomics and safeguard the workforce with low vibration exposure. All of these tools are designed with powerful torque-multipliers yet operate quietly and smoothly for low vibration. In conducting vibration risk evaluation with HYTORC Power Torque Tools the declared values in the specification table below are input to the calculation. The result of the evaluation is almost always sufficiently "low risk" that further administrative controls are not required. When using HYTORC Power Torque Tools, employers can rest assured they have selected the safest tool and they are protecting the health and safety of their workforce.

LOW VIBRATION ELECTRIC TOOLS



Torque Tools (Left to right):
LITHIUM SERIES® II Electric Torque Tool, LITHIUM SERIES® Electric Torque Tool,
LION GUN® Electric Torque Tool

LOW VIBRATION PNEUMATIC TOOLS



jGun® DIGITAL Single Speed
Pneumatic Torque Tool

HYTORC POWER TORQUE TOOLS - VIBRATION SUMMARY

PRODUCT MODEL	TORQUE TOOL CATEGORY ^[1]	VIBRATION ^[2] m/s ²
LITHIUM SERIES I BTM-1000-DOC	Electric (36V)	< 1.5
LITHIUM SERIES II LST-1200	Electric (36V)	< 1.0
LITHIUM SERIES II LST-5000	Electric (36V)	< 1.0
LION GUN-0.25	Electric (18V)	< 1.5
LION GUN-0.7	Electric (18V)	< 1.5
jGun DIGITAL D.5	Pneumatic	< 1.0
jGun DIGITAL D1	Pneumatic	< 1.0
jGun DIGITAL D2	Pneumatic	< 1.0
jGun DIGITAL D8	Pneumatic	< 1.0

[1] All Electric models comply with ISO-EN/EC 62841-1 "Electric Motor-Operated Hand-Held Tools, Transportable Tools and Lawn and Garden Machinery."

[2] All vibration values reflect testing under no-load conditions per BS/EN/ISPO 5349-1:2001, "Mechanical vibration – Measurement and evaluation of human exposure to hand-transmitted vibration."

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