



Working hard together to reduce the impact of Hand Arm Vibration

Reducing Vibration Exposure with Consumables

A case study by HAVi Technologies, PFERD and TecForce to look at safer methods of operation, April 2023

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Highlights

- Using consumables optimised for low vibration increased safe¹ usage time by more than 200%
- Using the optimised consumables enabled the operator to complete the same task in only 1/3 of the time.

¹ The existence of any level of vibration causes harm. The context of the word 'safe' in this document relates to the exposure permissible under CVWR 2005 regulations and the accompanying HSE guidelines on vibration, L140.

Background

In order to reduce exposure to vibration, we need to focus on the amount of vibration emitted by the tool in use whilst at the same time minimising the time to complete the task. The HSE, in their guidelines L140, refer to these variables as the Vibration Magnitude and the Trigger Time. Indeed, they go further and direct us to reduce risk to As Low As Reasonably Practicable (ALARP) by mandating the creation of a Suitable & Sufficient Risk Assessment to manage these.

Failure to manage these risks properly leads to employees being harmed by incurable damage the blood vessels, nerves and other soft tissues in the hand and lower arm. This damage is known as Hand Arm Vibration Syndrome (HAVs) and we are duty bound to manage it under the Control of Vibration Regulations (2005). These regulations are enforceable by the HSE and increasingly by the civil courts.

Methodology

Our teams measured the vibration magnitude and Trigger Time resulting from the use of a single grinder (FEIN WSG 17-125P) with 2 types of grinding consumable; the existing Grinding Steel currently in use at TecForce and the PFERD CC Grind Robust disk. The same operative was used throughout the test.

For the Vibration Magnitude test, a Svantek SV106 six channel human vibration meter and Analyser was used in accordance with BS EN ISO 5349-2 & BS EN ISO 8041 (Calibration date: 24.02.23). The operative performed surface grinding on a mild steel plate.



For the Trigger Time Test, a latest generation HAVi+ Trigger Time and HAVi watch were used to accurately record the vibration exposure. The operative used the FEIN grinder to grind a 300mm weld flat on a mild steel plate.

All tests were carried out on site at TecForce, Litchurch Lane, Derby on Thursday 6th April 2023.

Results

Vibration Magnitude Test

Consumable	Vibration Magnitude ² (MS ²)	Time to EAV ³ (hr:mm:ss)	Time to ELV ⁴ (hr:mm:ss)
Existing Grinding Steel	8.6	00:40:00	02:42:00
PFERD CC Grind Robust	4.7	02:15:00	09:03:00

² The Vibration Magnitude was measured in accordance with BS EN ISO 5349-2 & BS EN ISO 8041 using a calibrated device.

³ The Exposure Action Value (EAV) is the point at which an employer is required to take action to limit exposure by the employee. This typically takes the form of Health Surveillance aligned with various tactical changes such as job rotation and the investigation of alternative working methods. The HSE guidelines recommend the EAV is set to 100 points, however it is typically set lower than this for those with pre-existing HAVs symptoms.

⁴ The Exposure Limit Value (ELV) is the point at which vibration exposure must cease. It is critical that actions are undertaken to prevent repeat breaches at this level. The HSE guidelines recommend the ELV is set to 400 points, however it is typically set lower than this for those with pre-existing HAVs symptoms.

Trigger Time Test

Consumable	Time to complete task ⁵ (hh:mm:ss)	Vibration Exposure (pts)
Existing Grinding Steel	00:04:04	10
PFERD CC Grind Robust	00:01:21	0

⁵ The task required the same operative to grind a 300mm weld smooth and flat on a piece of mild steel.

Conclusions

Consumables optimised for low vibration, such as those supplied by PFERD have the potential to significantly reduce the harm done to employees from using vibrating power tools. Furthermore, they can also significantly improve productivity by reducing the time taken to complete the task.

Report Authorities



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Want to know more?



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PFERD are a leading provider of innovative, high performance, and progressive solutions; including low vibration products, for the Industrial Sectors.

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