

Smart Hand Tool Technology - HAVSafe

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Abstract

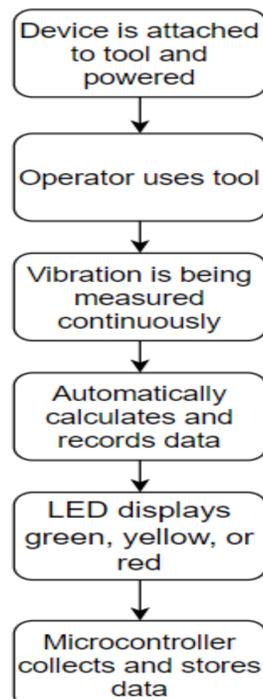
HAVSafe is a **small device** that attaches to multiple types of power tools- measuring **notifying the user** vibration exposure and when **unsafe levels** have been reached for the day. The primary goal of the device is to reduce cases of **Vibration White Finger**.

The result is a lifetime of-

- Tingling
- Numbness
- Loss of dexterity
- Weakness of grip
- Blanching of the fingers

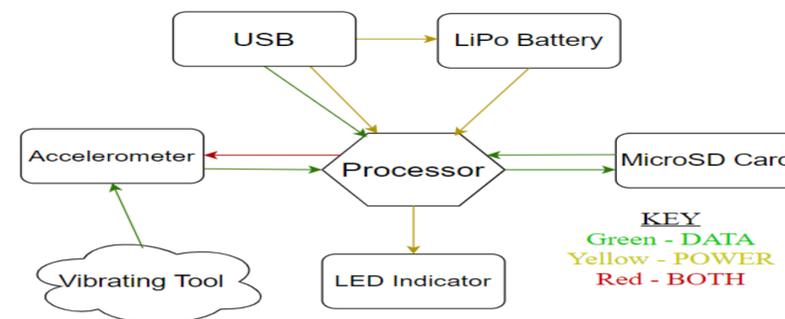


Introduction

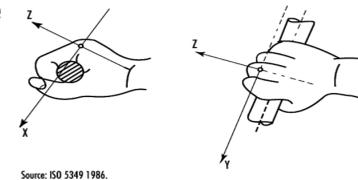


A popular product on the market to prevent **Hand-Arm Vibration Syndrome (HAVS)** are anti-vibration gloves; however the user receives little benefit from them for frequencies under 25 Hertz. **HAVSafe is a more reliable alternative** as it uses a microcontroller to take data from an accelerometer and through an LED displays when unsafe levels have been reached. Data is then logged on a microSD card.

Methods and Materials



A key component to HAVSafe is the **triaxial MEMS accelerometer**- collecting data from all three orthogonal directions..



Results

HAVSafe includes a **multithreading feature**- continuously reading from the accelerometer in one loop and simultaneously process the data in a separate loop.

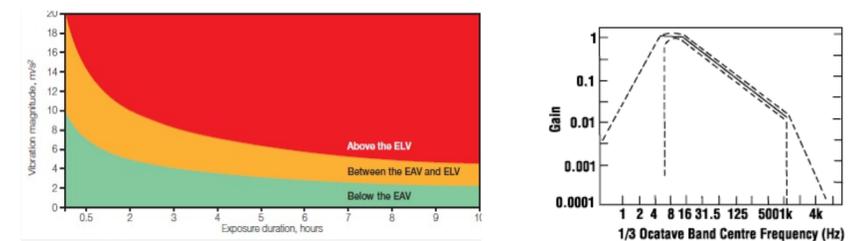
The **push button** allows users to reset data save to a log file on a microSD card. Data is then cleared, and a new session is started.

Clock Timer Interrupt samples the continuous vibration signals being received at regularly space time intervals.



Discussion

Sensitivity is not equal to vibration energy at all frequencies! The most detrimental is between 8-1K Hz. So, **vibration level and duration** affect exposure to HAVS.



Conclusions

HAVSafe provides quick and precise data that users have immediate access to. Made to endure harsh industrial environments with its aluminum 6061 T-6 casing.



It also follows ISO 5349 standards for compliance and protection; making sure the device is mounted correctly and does not interfere with the user.

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