HAVMETER

THE CONCEPT

BASED ON THE UK'S LEADING METHODOLOGIES ON HUMAN VIBRATION EXPOSURE, THE HAVMETER IS THE CORE OF A NEW WAY TO MANAGE EMPLOYEES EXPOSURE TO HAND – ARM VIBRATION (HAV).

THE HAVMETER GIVES POWER TOOL USERS A RUNNING TOTAL OF THEIR VIBRATION POINTS EXPOSURE THROUGHOUT THE DAY AND WARNS BEFORE HIGH EXPOSURE LEVELS ARE REACHED.

INDIVIDUAL EXPOSURE RECORDS ARE AUTOMATICALLY DOWNLOADED TO THE BASE STATION AND CAN BE USED TO REPORT ON HAV POLICIES.

ADDITIONAL VALUABLE INFORMATION SUCH AS TOOL USAGE AND DETAILS OF TOOLS PRODUCING ABNORMAL OR EXCESSIVE AMOUNTS OF VIBRATION CAN ALSO BE RECORDED.

HAVMETER

KEYFEATURES

- Continuous and clear display of vibration dose to reduce high vibration exposure

- Designed for use on all tools, including pneumatic, mains and battery powered

- Automatic HAV exposure record for each employee

- Quality data on employee exposure, tool usage and tool vibration performance

- Can be used to improve tool management processes

USING THE HAVMETER

1. TOOL TAG

Attach colour coded tool tags to required tools.

2. UNIT PICK-UP

Employee signs out HAVmeter from Base Station.

3. PORTABLE DEVICE

Unit is taken with employee for day's work, magnetically clips to any tagged tool and clocks up vibration exposure in points system.

4. THE BASE STATION

At the end of the day the employee returns the unit to the base station for charging, where it automatically downloads and stores data.

SYSTEM COMPONENTS
UP CLOSE

HAVMETER

The HAVmeter is a small, durable device, carried throughout the working day. It has been designed with no external buttons or switches to ensure ruggedness, ease of use and to make the device tamper-proof. The size of a pager, the HAVmeter magnetically attaches to the hand held power tools used throughout an employee's shift via colour-coded Tool Tags.

The HAVmeter gives the user a running points total and individual tool points total on the display screen and alerts the worker when Exposure Action Value (EAV) and Exposure Limit Value (ELV) thresholds are reached using coloured lights. It is returned at the end of the day for recharging, when it automatically downloads a record of exposure to the base station.

HAVMETER OPERATION

I) EXPOSURE POINTS CALCULATION

The HAVmeter incorporates state of the art RFID technology and in built accelerometers. When attached to a tool tag the HAVmeter instantly knows what tool it is connected to and the average vibration level associated with that tool. This information is pre programmed onto the colour-coded tool tags and read wirelessly by the HAVmeter using RFID technology.

The HAVmeter's inbuilt tri axial accelerometer is used to accurately measure trigger time. This trigger time, in combination with the average tool vibration value, allows the HAVmeter to calculate hand arm vibration exposure in terms of the HSE's points system.

II) TOOL VIBRATION MEASUREMENT

Over time any power tool will deteriorate and the in-use vibrations generated will increase for a variety of reasons. Tri-axial accelerometers are used not only to determine the trigger time but to record in-use tool vibration levels.

In use vibration data is not used in calculating HAV exposure points but can be used to highlight to the operator when a tool is producing abnormal vibration levels. The feature allows the operator to use a tool in confidence knowing that any significant increase in tool vibration level will trigger a visual alarm. This will allow you to reassess preprogrammed values on the tooltag as well as highlighting tools which require maintenance; forming the basis of a condition monitoring programme.

HAVMETER

VIBRATION SOLUTIONS

BASE STATION

The base station acts as the recharge and docking bay for up to eight HAV units. When an employee swipes their personal ID card or enters their PIN number the base station tells each employee which HAVmeter to pick up, and they then keep that HAVmeter for the day.

When the HAVmeter is returned to the base station, recharging begins and all information recorded throughout the day is automatically downloaded to the base station internal memory where it can be transferred using a standard memory card.

This information can be easily uploaded into custom HAV management software. It can be used to make sure employees are not exceeding the legal exposure limit set by the HSE and monitor policy changes. It will be possible to see the effect of employee HAV awareness training quickly and easily by looking at how tool usage changes.

The base station can be powered by mains or 12 volt supply allowing mobile teams to equip a van, pictured below.

ID CARD

A magnetic swipe card be used to identify employees and store information relating to training and levels of vibration exposure allowed.

The cards can be delivered blank or with a pre-printed back ground which can be printed and encoded by Reactec.

The format will be determined by the customer.

A pre-printed example is shown here:

TOOL TAG

The red, orange and green colour-coded tool tags are small, extremely rugged components which are attached to every tool. The tool tag provides a base on which the HAVmeter is magnetically attached. All information about the tool is contained in the RFID tag housed within. The following data is then instantaneously read by the HAVmeter upon connection:

• Tool make and model

• Unique tool ID number

• Average Tool Vibration Value

The information contained in the tool tag can be easily altered even when mounted to a tool ensuring tags can be kept up to date easily and allowing them to be transferred to different tools if necessary.

TOOL TAG MOUNTING

The tag fits directly onto almost all hand operated equipment and is easily attached to small or curved tool surfaces using a jubilee clip, zip tie or adaptor plate.
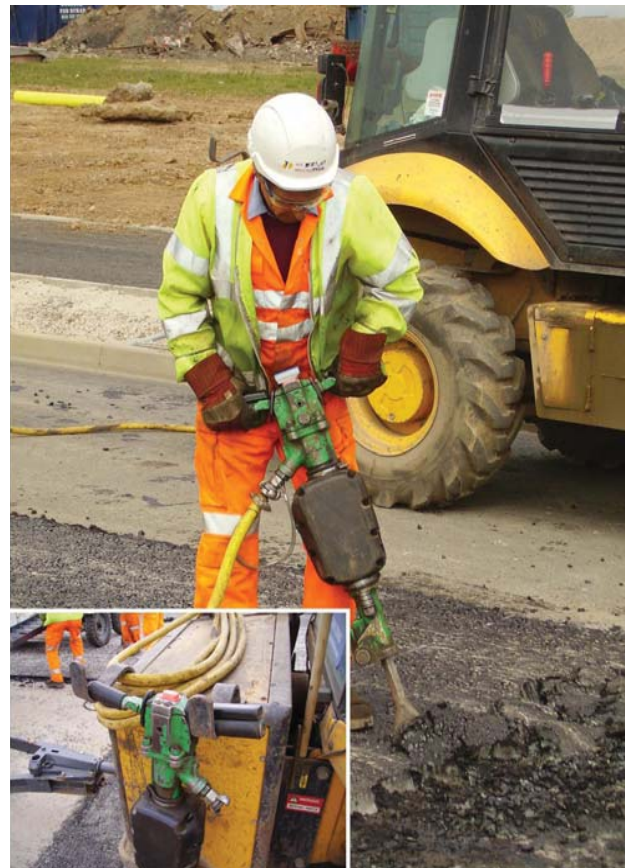
ASSET MANAGEMENT

With its in-built RFID technology the tool tag can serve as an asset management device, allowing tools to be scanned in or out of a central depot or site. Each time a tool is used, the HAVmeter records the trigger time, which can allow you to see exactly how long any tool has actually been used. Such information is valuable when tool maintenance is to be carried out. Other advantages of the programmed tool tag include:-

• An organisation being constantly up to date with the quantity and location of their assets

• The movement of assets can be monitored between multiple sites

• Detailed tool information can be quickly retrieved and uniquely identified for asset security

SOFTWARE

The HAVmeter automatically downloads vibration exposure information to the base station. This can be quickly and easily opened and reviewed. In addition, time-saving automatic report generation, tool management, task management, and employee management software is also available. Our support staff would be happy to discuss your software needs.

DATA GATHERED

The graph in figure 1 shows threshold vibration levels for the EAV and ELV. Figure 2 shows how these are converted into the points system. The table in figure 3 is an example of record of data recorded for two employee using three tools. Exposure points are shown in the final column on the right.

In addition to providing detailed vibration exposure information the HAVmeter also provides valuable data for any company interested in improving working practises.

fig.1*
A plot of vibration magnitude against time, colour coded with respect to exposure action value (EAV) and exposure limit value (ELV).
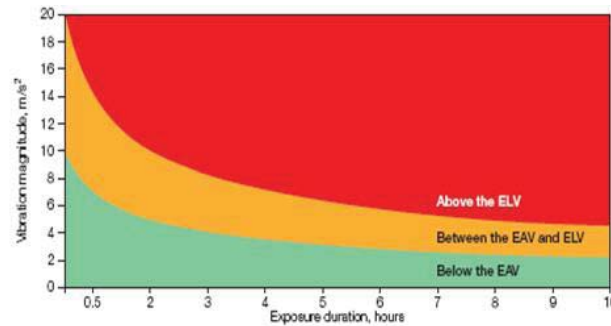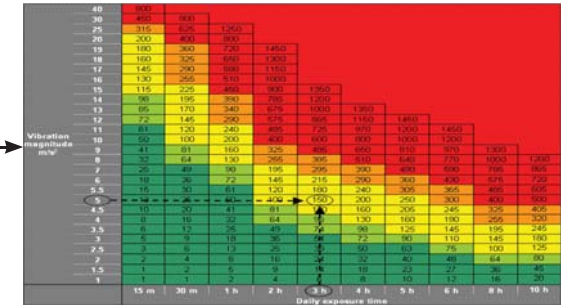

fig.2*
How vibration magnitude and exposure are converted into points, according to the HSE point system.

Employee	EAV Time	Tool ID	Tool type	Connect Time	Disconnect Time	Connection Time	Trigger Time	Dose Level	Exposure (Points)
L Wood	12:02:58	Makita 90695		09:24:22	09:24:53	00:00:31	00:00:00	6.0	0
		Makita 90695		09:25:00	17:18:21	07:53:21	02:36:35	6.0	188
Total						07:53:52	02:36:35		188
L Wood	12:38:04	Makita 9401	Belt Sander	08:21:28	08:21:41	00:00:13	00:00:00	5.0	0
		Makita 9401	Belt Sander	08:22:37	08:57:23	00:34:46	00:16:15	5.0	14
		Makita HP2030	Drill	08:57:28	12:07:13	03:09:45	00:05:30	18.3	62
		Makita 90695	Grinder	12:14:12	12:14:22	00:00:10	00:00:00	6.0	0
		Makita HP2030	Drill	12:14:27	12:14:32	00:00:05	00:00:00	18.3	0
		Makita 90695	Grinder	12:14:37	12:14:42	00:00:05	00:00:00	6.0	0
		Makita 9401	Belt Sander	12:14:44	12:14:50	00:00:06	00:00:00	5.0	0
		Makita 90695	Grinder	12:14:53	15:34:58	03:20:05	01:48:17	6.0	130
		Makita HP2030	Drill	15:35:04	15:35:14	00:00:10	00:00:00	18.3	0
		Makita 9401	Belt Sander	15:35:16	15:35:21	00:00:05	00:00:00	5.0	0
		Makita 90695	Grinder	15:35:31	16:24:57	00:49:26	00:23:07	6.0	28
		Makita HP2030	Drill	16:25:04	16:25:10	00:00:06	00:00:00	18.3	0
		Makita 9401	Belt Sander	16:25:13	16:25:16	00:00:03	00:00:00	5.0	0
		Makita 90695	Grinder	16:25:36	16:25:52	00:00:16	00:00:00	6.0	0
		Makita 90695	Grinder	16:25:56	17:33:12	01:07:16	00:00:00	6.0	0
		Makita 90695	Grinder	17:33:14	17:33:17	00:00:03	00:00:00	6.0	0
Total						09:02:40	02:33:12		233

fig.3   The table above shows a summary of data collected from the HAVmeter . The table contains information on what tools were used, when they were used, how long they were used for and the vibration exposure received in terms of the HSE's points system.

*Images taken from HSE publication L140 *2005*

HAVMETER

TECHNICAL SPECIFICATION

HAVMETER

Dimensions	65mm x 40mm x 25mm
Weight	110 grams
Sealing	IP65 (Dust & Water proof)
Enviroment	**Temperature**
	-10ºC to + 50ºC Operating
	-20ºC to + 60ºC Storage
	Humidity
	Up to 95%RH Non-Condensing
Battery	Lithium Polymer
Battery Life	12 Hours
Battery Recharge/	Wireless
Recharge Duration	4 Hours
Communication (with Base Station)	RFID wireless communication
Download Duration	Approx 10 seconds
Measurement	Trigger Time; In use vibration tool
Function	Vibration Levels
Accelerometers	Tri-Axial
Measurement Range	Up to 250g
Weightings	In-use vibration levels weighted according to (legislation)
Memory	Maximum 500 tool conections/ disconnections per day
Trigger TimeAccuracy	Accuracy to within 1 second

BASE STATION

Dimensions	386mm x 176mm x 30mm
Weight	800 grams
Sealing	IP54
Enviroment	**Temperature**
	-10ºC to + 50ºC Operating
	-20ºC to + 60ºC Storage
	Humidity
	Up to 95%RH
	Non-Condensing
Power	Mains adaptor /12V Power Supply
Communication (with HAVmeter)	RFID wireless communication
Memory	Memory Card dependant: 2 years DATA (based on full HAVmeter utilisation) can be stored on 512Mb

If you have any questions or would like any further information please do not hesitate to get in touch:

UK SALES & SERVICE CENTRE

Pioneer Road, Faringdon, Oxon, SN7 7BU
Tel: 01367 241675 Fax: 01367 242491

www.shawcity.com