



# Goede praktijk voor aanpak van geluid & trillingen.

*Calum Leggat*





# Commonwealth War Graves Commission

- Verzorgt de graven & monumenten van bijna 1.7 miljoen gesneuvelden uit de beide wereldoorlogen.
- Omvat 23.000 locaties in 154 landen.
- Van heel kleine begraafplaatsen (4 graven in Ocracoke Island) tot hele grote (12.000 graven op Tyne Cot in Passendale).
- Medewerkers: 1.300 waarvan 850 tuiniers
- Te onderhouden oppervlakte: 750 hectare





Deel 1: Hand & arm trillingen

Deel 2 : Geluid



# 1. Hand & arm trillingen



# Symptomen van hand & arm vibratie

- Tinteling en gevoelloosheid in de vingers en handen.
- Gereduceerde gripsterkte en handigheid.
- Verminderde gevoeligheid voor aanraking en temperatuur.
- De vingers worden wit en ze worden nadien rood en pijnlijk.  
(vooral bij koude en natte omstandigheden)
- Stijfheid in de gewrichten van polsen, ellebogen en schouders.



# Hoe pakken wij dit aan ?

- Meting van alle machines.
- Puntensysteem (maximum 400 punten per dag).
- Opleiding.
- Tool Box meeting (herhaling van het systeem).
- Registratieblad.



# Hoe vermijdt je problemen ?

- Niet meer dan **400 punten per dag**.
- Hou de handen warm.
- Job rotatie.
- Keuze van machine (lager trillingsniveau).
- Stop met roken (roken vermindert de bloedsomloop).
- Machines minder lang gebruiken



# Ons systeem:



## HAV's – Ken je limieten

<b>10</b>	<b>20</b>	<b>50</b>
<b>75</b>	<b>100</b>	<b>150</b>
<b>200</b>	<b>300</b>	<b>400</b>





10 → 50



75 → 150



200 → 400





HAV waardering	Activeringstijd
50	8 uur
100	4 uur
150	2uur 30
200	2 uur
300	1uur 15
400	1 uur



# Registratieblad



Machine type	Punten per uur	Aantal uren	Punten
Bosch GBH10DC Breaker	150	1,5	225
Hilti DC125S diamantschijf	100	0,5	50
Bosch GWS24-230B	75	1,25	93,75
Totaal punten per dag			368,75









Werktuig	X	Y	Z	€	Sec s	HAV Rating
Honda Pro RH536 13/187	2,84	3,66	3,89	6,03	39	(73) <b>75</b>
Hilti TE905AVR	4,2	3,9	5,6	8,0	55	(128) <b>150</b>
Eliet Edger KS240 17/001	1,83	3,75	2,54	4,87	33	(47) <b>50</b>





$$\sqrt{a^2hw_x + a^2hw_y + a^2hw_z} = \text{Vector sum ahv}$$

$$\sqrt{4,2^2 + 3,9^2 + 5,6^2}$$

$$\sqrt{17,64 + 15,21 + 31,36}$$

$$\sqrt{64,21}$$

$$= 8\text{m/sec}^2 = 128 \text{ points}$$



# Video & Calculator





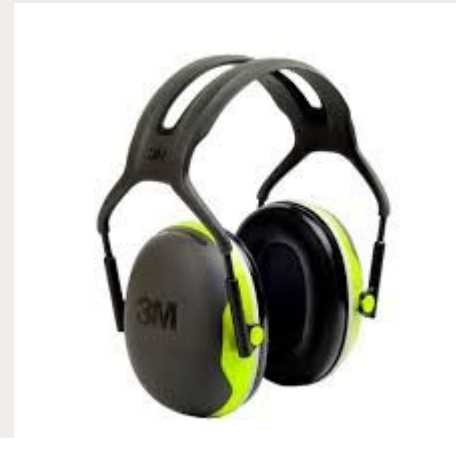


**CWGC**  
Commonwealth War Graves Commission



## 2. Geluid

Oorkap 3M Peltor



Oordoppen



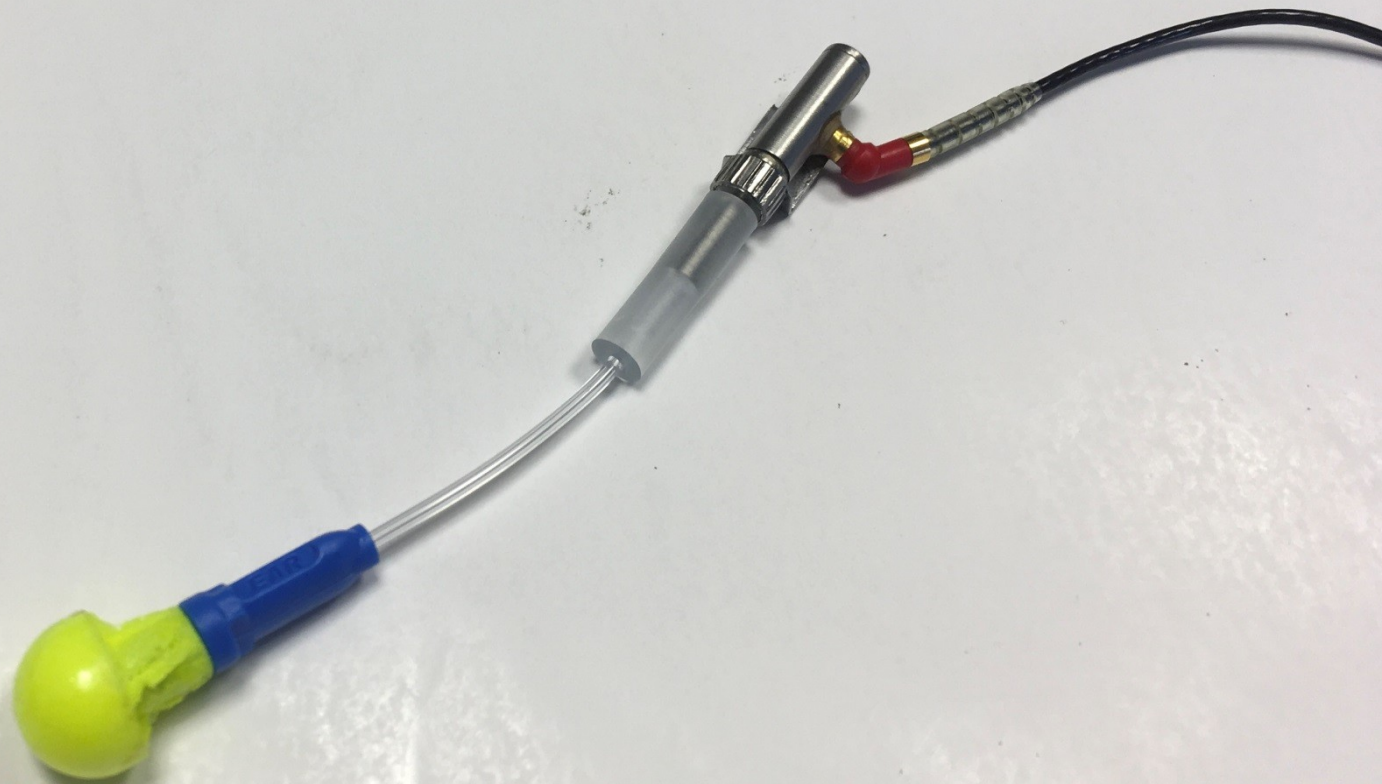




A wooden speaker with a circular mesh grille is mounted on a black stand. A white cable connects the speaker to the laptop. The stand has a black marker attached with the text "Dixie Stapes Stent".

The laptop screen displays the "EARfit Product Family" web application. The interface includes a sidebar menu with options like "Home", "Custom Legging", "Follow Up", "Product Selection", and "Product Family". The main content area shows "Please choose the product family" with several product selection options: "Foam Roll-down Products", "Crash-Up Fit Foam Products", "Promoted Favorite Products", and "Custom Products". The 3M logo is visible at the bottom of the screen.

Two yellow earbuds with blue cables are resting on the laptop keyboard.






<http://www.hse.gov.uk/NOISE/hearingprotection/index.htm>



**CWGC**  
Commonwealth War Graves Commission

# 3M EARFIT Validatie systeem

E-A-Rfit v3M.4.4.17.0



Summary  
CWGC

Hardware Set-Up

Visit Creation  
 Select Company  
 Select Employee

Product Selection  
 Select Product Family  
 Select Product and Test Eligibility  
 Choose Product Size

Testing  
 Attenuation Measurement on the Right Ear  
 Attenuation Measurement on the Left Ear

Visit Result

Employee Selection

*Last Name	*First Name	*Exposure Level	Number	Section	Function
Hofkens	Marino	103	CL2524		
Janssen	Bas	103			
Jonckheere	Sammy	103	CL		
Kurzahls	Katja	103	CL2921		
Kutsch	Ralf	103	CL2784		
Leeuwerck	Karel	103	CL3218		
Leggatt	Calum	103	p2291		
Leggatt	Calum	103	P2291		
Naworth	Guido	103	2868		
Pattyn	Ivan	103	CL2334		
Richiusa	Daniel	103	CL5001		
Robertson	Ian	80	CL2890		
Rudolf	David	103	CL2966		
Scholz	Oliver	103	CL5000		


New Visit

Audiogram

Date: \_\_\_\_\_  
Notes: \_\_\_\_\_

Visits

Visit Type	Visit Result	Date	Notes	Technician Code	Product	Left Filter (if applicable)	Right Filter (if applicable)	Test type	Earmuffs
Follow Up	Successful	2017-07-07 14:19:48		LEGG0183	E-A-R™ Push-Ins™				No
New Visit	Successful	2015-01-22 11:19:31		LEGG0183	E-A-R™ Push-Ins™				No



NL 14:27 7/07/2017







### Product Family

Please choose the product family



Foam Roll-down Products



Push-to-fit Foam Products



Premolded Reusable Products



Custom Products

**Summary**

- CWGC
- Calum Leggatt
- Follow Up

**Hardware Set-Up**

**Visit Creation**

**Product Selection**

- Select Product Family
- Select Product and Test Eligibility
- Choose Product Size

**Testing**

- Attenuation Measurement on the Right Ear
- Attenuation Measurement on the Left Ear

**Visit Result**





Summary

- CWGC
- Calum Leggatt
- Follow Up

Hardware Set-Up

Visit Creation

Product Selection

- Select Product Family
- Select Product and Test Eligibility
- Choose Product Size

Testing

- Attenuation Measurement on the Right Ear
- Attenuation Measurement on the Left Ear

Visit Result

Select Product and Test Eligibility

Please answer the following questions

- E-A-R™ Push-Ins™
- E-A-R™ Push-Ins™ Metal
- E-A-R™ Express™ Pod Pl
- E-A-R™ Express™ Metal
- 3M™ Skull Screws™
- 3M™ Torque™
- 3M™ E-A-R™ Push-Ins™ with Grip Rings
- 3M™ No-Touch™



E-A-R™ Push-Ins™

Navigation icons: back, forward, help, settings, edit, info, camera. Language dropdown: English

Questionnaire Complete

- Earache  Yes  No
- Visual Inspection  Fail  Pass



Windows taskbar with icons for Internet Explorer, File Explorer, VLC, Outlook, Firefox, Skype, Photos, Word, and a user profile picture.

Windows system tray showing language (NL), network, volume, and system clock (14:28 7/07/2017).





**Summary**

- CWGC
- Calum Leggatt
- Follow Up
- E-A-R™ Push-Ins™

**Hardware Set-Up**

**Visit Creation**

**Product Selection**

**Testing**

- Attenuation Measurement on the Right Ear
- Attenuation Measurement on the Left Ear

**Visit Result**

- Results
- Reports

### Right Ear

#### Test Functions

0 Test(s) Done

Start Test   Fitting Noise

#### Fit Variability Measurement Bank

0 Test(s) Banked

Add   Reset

**Please Do Not Talk or Move Your Jaw During the Test**

#### Sound Pressure Level

#### Personal Attenuation Rating (PAR)





### Right Ear

#### Test Functions

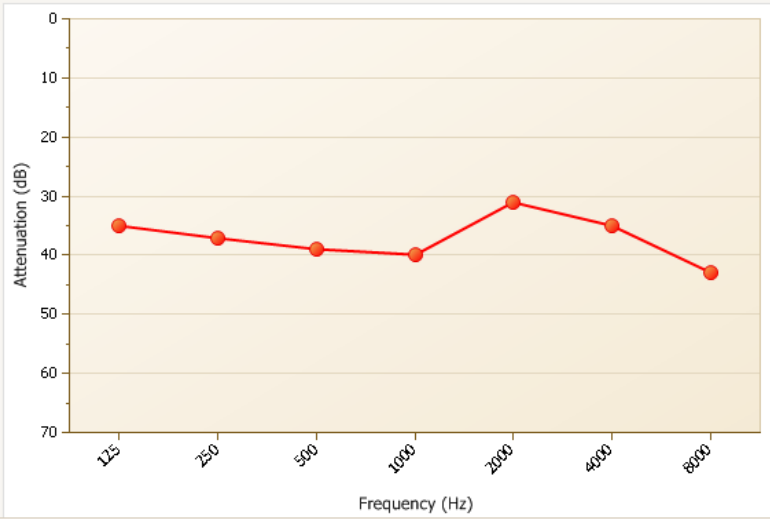
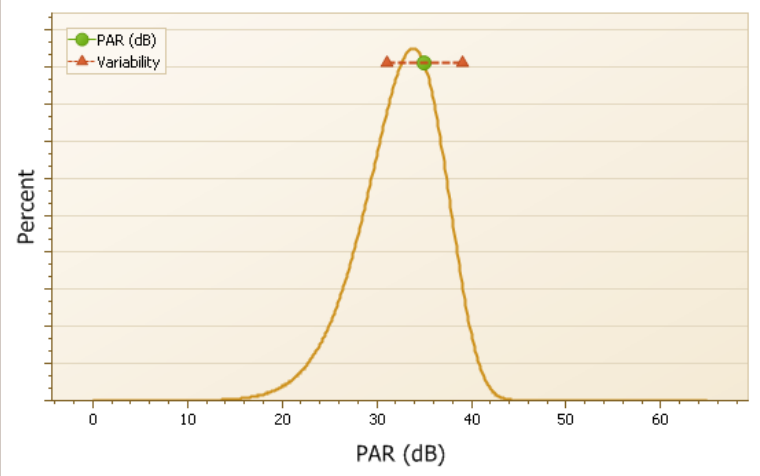
1 Test(s) Done

#### Fit Variability Measurement Bank

0 Test(s) Banked



#### Fitting Profile Measured Levels



#### Sound Pressure Level

**Reference (external):** 83 dBA  
**Measurement (internal):** 53 dBA

#### Personal Attenuation Rating (PAR)

35 dB





**Summary**

- CWGC
- Calum Leggatt
- Follow Up
- E-A-R™ Push-Ins™
- 35 dB
- 34 dB

**Hardware Set-Up**

**Visit Creation**

**Product Selection**

**Testing**

- Attenuation Measurement on the Right Ear
- Attenuation Measurement on the Left Ear

**Visit Result**

**Left Ear**

**Test Functions**

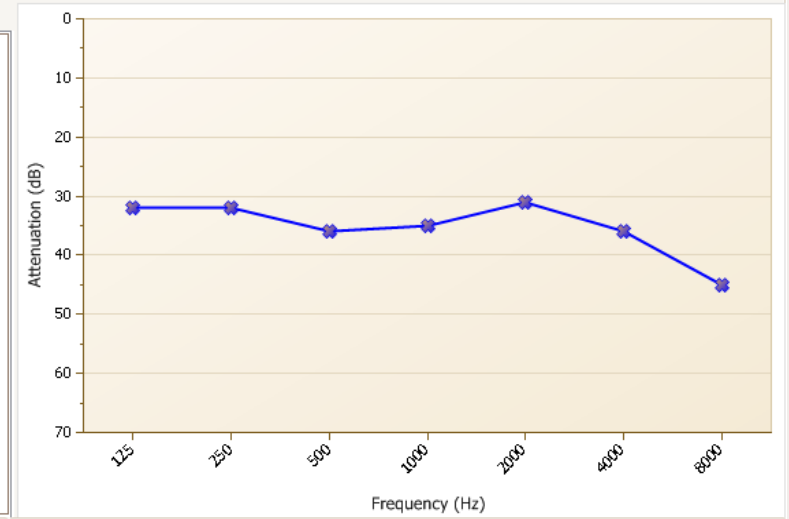
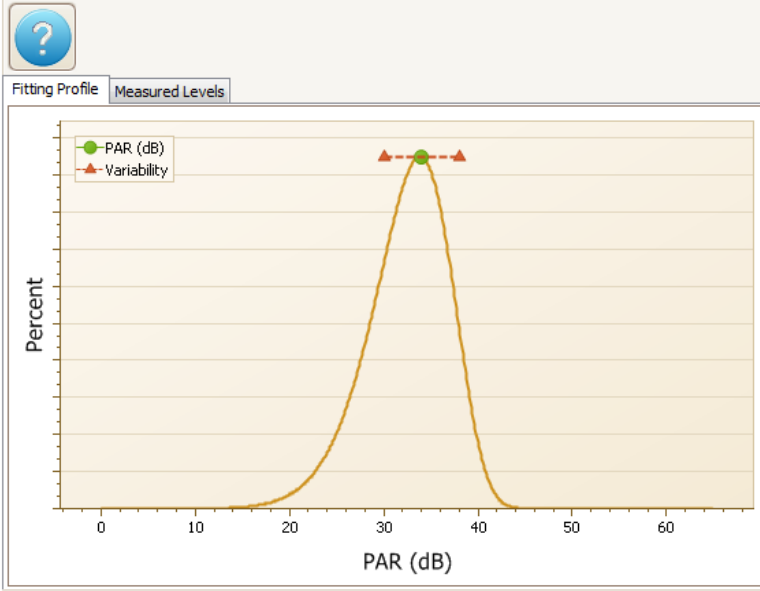
Start Test    Fitting Noise

1 Test(s) Done

**Fit Variability Measurement Bank**

Add    Reset

0 Test(s) Banked



**Sound Pressure Level**

Reference (external): 84 dBA  
 Measurement (internal): 57 dBA

**Personal Attenuation Rating (PAR)**

34 dB

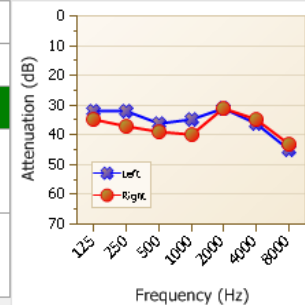




## Results

### Performance Outcome **Fitting Profile**

	Left	Right	Binaural
<b>PAR (dB)</b>	<b>34 ±5</b>	<b>35 ±5</b>	<b>34 ±5</b>
<b>Protection Sufficiency</b>	<b>Pass</b>	<b>Pass</b>	<b>Pass</b>
<b>Computation of Protection Sufficiency</b>	Employee Exposure - Binaural PAR = Protected Exposure 103 dBA - 29* = 74 dBA		
<b>Computation of Protection Maximum</b>	Company Exposure Limit + Binaural PAR = Protected Maximum 80 dBA + 29* = 109 dBA		



\* 3M recommends using the PAR minus the variability value to predict user protection. Variability values include a combination of user fitting variability, variation in the user's noise spectrum, and also the measurement variability itself.

Values shown are the average of all banked values in each ear.

**Summary** ^

- CWGC
- Calum Leggatt
- Follow Up
- E-A-R™ Push-Ins™

---

**Hardware Set-Up** v

**Visit Creation** v

**Product Selection** v

**Testing** v

**Visit Result** ^

- Results
- Reports





**Summary**

CWGC

Hardware Set-Up

Visit Creation

Product Selection

Testing

Visit Result

Results

Reports

## Testing Results

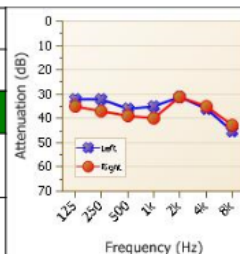
Enter Some Notes

## Preview

**Employee Name** Calum Leggatt      **Product** E-A-R™ Push-Ins™  
**Test Date** 2017-07-07      **Size** Regular  
**Company Name** CWGC  
 Elverdingestraat 82, Ieper, BELGIUM, 8900

### Test Information

	Left	Right	Binaural
<b>PAR (dB)</b>	34±5	35±5	34±5
<b>Protection Sufficiency</b>	Pass	Pass	Pass
<b>Computation of Protection Sufficiency</b>	Employee Exposure - Binaural PAR = Protected Exposure 103 dBA - 29* = 74 dBA		
<b>Computation of Protection Maximum</b>	Company Exposure Limit + Binaural PAR = Protected Maximum 80 dBA + 29* = 109 dBA		



\* 3M recommends using the PAR minus the variability value to predict user protection. Variability values include a combination of user fitting variability, variation in the user's noise spectrum, and also the measurement variability itself.

Values shown are the average of all banked values in each ear.

### System Information

**Technician Name** Calum Leggatt      **Speaker Serial Number** 6705  
**Technician Code** LEGG0183      **Last Calibration :** 2013-03-25  
**Software Version** 3M.4.4.17.0      **Microphone Serial Number** 10051



Current Page No: 1

Total Page No: 1

Zoom Factor: 86%

Windows taskbar with icons for Internet Explorer, File Explorer, VLC, and various system utilities. System tray shows date and time: 14:26 7/07/2017.





# Conclusie

10 jaar ervaring met ons systeem voor trillingen

4 jaar ervaring met het testen van gehoorbescherming

Door onze mensen te betrekken bij de keuze van beschermingsmiddelen en bij het regelmatig testen ervan weten we dat ze deze ook consequent gebruiken tijdens de uitvoering van hun werk.