Noise Calculator - Main menu

V4-12 March 2021

The *Control of Noise at Work Regulations 2005* define actions based on
Exposure Action Values (LEAV and UEAV) and the Exposure Limit Value (ELV) for personal daily or weekly noise exposures.

Hover the cursor over yellow text for additional information

Applicable to all daily noise exposure calculations:

For any noise exposure use the Daily Noise Exposure Action Value Calculator

Applicable for daily noise exposure calculations if you are using **hearing protection** to control noise risk:

Use the Daily Noise Exposure Limit Value Calculator if you are using hearing protection as part of your noise control programme

Applicable if you have daily noise exposure on one or two working days a week that is at least 5 dB higher than other days:

To estmate weekly exposures use the Weekly Noise Exposure Calculator

Daily Noise Exposure Action Value Calculator

V4-12 March 2021

The *Control of Noise at Work Regulations 2005* define Lower and Upper Exposure Action Values (LEAV and UEAV) of 80 and 85 dB(A).
This calculator estimates the **unprotected daily noise exposures** of workers for comparison with the LEAV and UEAV.

Task[1] name / description	Noise level[1] L_{Aeq} (dB(A))		Points per hour	Time (in hh:mm) to LEAV	Time (in hh:mm) to UEAV	Daily exposure time[1] (hours)	Daily exposure time[1] (mins)	Personal noise exposure per task (dB(A))	Personal exposure points per task
Task 1									
Task 2									
Task 3		0							
Task 4		0							
Task 5		0							
Task 6		0							
Task 7		0							

Total daily exposure time (hh:mm)	Daily exposure, $L_{EP,d}$ (dB(A))	Total daily exposure points

◯ Option Button -1022

Footnotes:

Daily Noise Exposure Limit Value Calculator

V4-12 March 2021

The *Control of Noise at Work Regulations 2005* defines an Exposure Limit Value (ELV) of 87 dB(A).
This calculator estimates the **protected daily noise exposures** of workers (i.e. it accounts for the use of hearing protection) for comparison with the ELV.

Hearing protector information:	**SNR** value (dB):		Model name (*optional*):	

Task[1] name / description	Noise level[1] L_{Aeq} (dB(A))		Noise level[2] L_{Ceq} (dB(C))	HP worn? (Yes/No)	Protected level dB(A)	Daily exposure time[1] (hours)	(mins)	Personal noise exposure per task (dB(A))	Personal exposure points per task
Task 1									
Task 2									
Task 3		0							
Task 4		0							
Task 5		0							
Task 6		0							
Task 7		0							

Total daily exposure time (hh:mm)	Daily exposure, $L_{EP,d}$ (dB(A))	Total daily exposure points

Footnotes:

Weekly Noise Exposure Calculator

V4-12 March 2021

The *Control of Noise at Work Regulations 2005* allows the use of weekly exposures in place of daily exposures where noise exposures vary markedly from day to day[1]. This calculator estimates weekly noise exposure from daily exposure values through the week.

This calculator can be used to compare weekly exposures with the Lower and Upper Exposure Action Values or the Exposure Limit Value. Please select the option that applies:

○ Comparison with LEAV & UEAV ◉ Comparison with ELV

Week Day	Job titles/descriptions	Daily noise exposure ◉ dB(A) ○ Points		Daily noise exposure points	
Sunday	Job Sunday		dB(A)		points
Monday	Job Monday		dB(A)		points
Tuesday	Job Tuesday		dB(A)		points
Wednesday	Job Wednesday		dB(A)		points
Thursday	Job Thursday		dB(A)		points
Friday	Job Friday		dB(A)		points
Saturday	Job Saturday		dB(A)		points

Weekly noise exposure			
	dB(A)		**points**

Footnotes:

Noise Exposure Calculators - Instructions

V4-12 March 2021

Main Menu

The main menu provides a starting point for the three closely related calculators included on this spreadsheet:

Noise Exposure Action Value Calculator

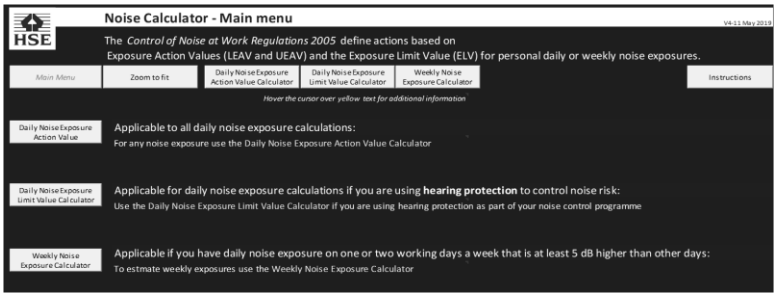
- This calculator is applicable to any noise exposures.

Noise Exposure Limit Value Calculator

- This calculator can be used if you are using hearing protection.

Weekly Noise Exposure Calculator

- This calculator can be used if you are considering weekly averaging of noise exposures.



Use the buttons across the top each sheet to access the three calculators and these instructions.

General

Data entry and calculated fields:

Colours are used to help identify the function of cells in the spreadsheets:

- **Grey** denotes column headings
- **White** denotes user-entry cells
- **Yellow** is used for calculated cells
- **Dark red** is the background colour. Instructions or other supplementary information may be shown in these cells

Colours are also used to provide information and warnings:

- **Dark red** is used when exposures are such that there are no specific actions required
- **Orange** cell colour is used for general information notes where exposures are above an action level
- **Light red** is used to flag those tasks where hearing protection may be under- or over-protecting the worker or where data is missing
- **Red** cell colour is used to warn where the noise exposure is at or above the exposure limit value
- Green is used for information when the noise level is below either the lower action value or the exposure limit value

T Yellow text is used to indicate that hovering the cursor over the cell will provide additional information

The calculators work from left to right. Enter a value in a white cell and the yellow cells to the right that can be calculated will be automatically populated.The calculator collates data from top to bottom. Each row is a separate task, but data from combining the tasks is shown beneath the relevant column.

Noise exposure ($L_{EP,d}$)

Daily noise exposure should first be considered as the daily personal noise exposure for the unprotected ear. Use the **Noise Exposure Action Value Calculator** to help identify the actions you should take that relate to the Lower Exposure Action Value (LEAV) and the Upper Exposure Action Value (UEAV).

If hearing protection is used (e.g. as an interim measure before engineering controls are implemented, use the **Noise Exposure Limit Value Calculator** to help you decide which hearing protection is neccessary to ensure that daily personal noise exposure at the ear is below the Exposure Limit Value (ELV).

Where noise exposures vary markedly from day to day, use the **Weekly Noise Exposure Calculator** to average exposures over a working week. Weekly averaging is only likely to be appropriate where daily personal noise exposure on one or two working days is at least 5 dB higher than other days, or the working week comprises three or fewer days of noise exposure.

Exposure points

Daily noise exposure is presented as both dB(A) values and exposure points.

Exposure points are calculated relative to a reference value. The HSE system uses the Upper Exposure Action Value (85 dB(A)) as a reference such that an exposure of 85 dB(A) for 8 hours a day gives 100 points.

Exposure points values are useful because they may be added together arithmetically, for this reason values such as "points per hour" may provide a quick way to estimate exposures.

"Zoom to fit" function

The Zoom to fit function resizes the calculator view, such that the visible size is optimised for the largest calculator (the Noise Exposure Limit Value Calculator).

"Return to calculator" function

The return to calculator function (on this page) returns to the last used calculator sheet.

Noise Exposure Calculators - Instructions

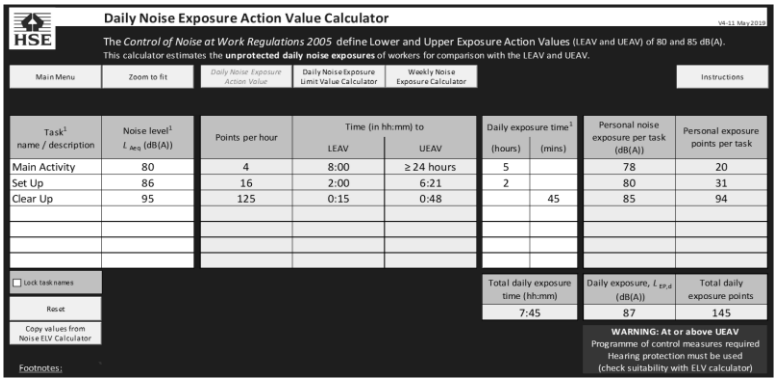
V4-12 March 2021

Daily Noise Exposure Action Value Calculator

The ***Daily Noise Exposure Action Value Calculator*** estimates daily personal noise exposures for comaprison with the Lower Exposure Action Value and the Upper Exposure Action Value (LEAV and UEAV) for daily exposure, as defined in the Control of Noise at Work Regulations 2005.

Values are entered for the noise levels (in dB(A)) associated with the main work activities; the calculator then shows:

- Points per hour for each activity
- Exposure time (for each activity on its own) to reach the LEAV and UEAV.



Values can then be entered for the actual personal daily exposure times for each activity (in hours and minutes);
the calculator then shows:

- The personal noise exposures per task and the equivalent value expressed as personal exposure points per task.

At the bottom of the table the personal exposure points per task are added together, to give:

- Total exposure time (in hh:mm)
  (Note - this value can be used to check that the calculator accounts for the full daily exposure time)
- Daily noise exposure (in dB(A))
- Daily noise exposure (in exposure points)

An information box is shown below the table, indicating how the calculated daily noise exposure relates to the lower and upper exposure action values (LEAV and UEAV).

"Reset" function:

- Clears all user-entered data in the current calculator page
  ie, "Noise level dB(A)" and "Exposure time" columns
- If the "Lock task names" option is not selected the task names are reset to "Task 1", "Task 2" ...
- If the "Lock task names" option is selected the task names are not changed

"**Copy values from Noise ELV Calculator**" button:

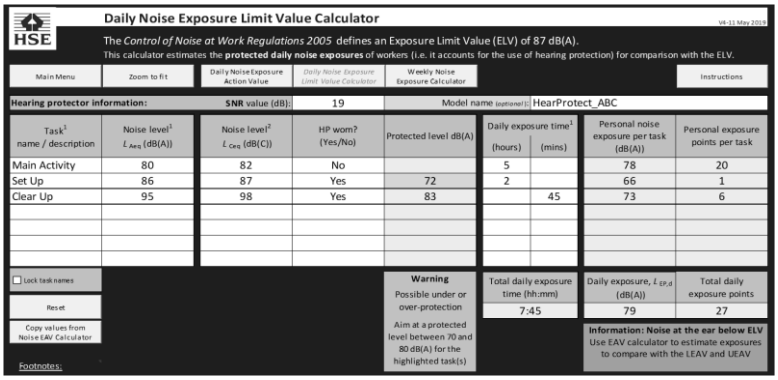
- If there are data values in the ELV calculator that you want to use in this EAV calculator, this button will copy all A-weighted noise levels and all exposure time values.
- Any existing data in the current calculator will be lost.

Noise Exposure Calculators - Instructions

V4-12 March 2021

Daily Noise Exposure Limit Value Calculator

The ***Daily Noise Exposure Limit Value Calculator*** estimates daily personal noise exposures for comparison with the Exposure Limit Value (ELV) for daily exposure, as defined in the Control of Noise at Work Regulations 2005.



Values are required for the A and C-weighted noise levels in dB(A) and dB(C) respectively.

NOTE 1: The C-weighted level should not be confused with the Peak C levels which are usually substantially higher (i.e. 20 dB or more higher) than the A-weighted level.

Select "Yes" or "No" in the "HP worn?" column.

NOTE 2: In accordance with HSE guidance, this calculator adds 4 dB to the level calculated at the ear to give a realistic P*rotected level* estimate of 'real world' wearing of hearing protection.

Under- or over-protection warning:

The calculator provides a warning if the model of hearing protection does not achieve noise at the ear between 70 and 80 dB(A) as recommended by HSE, i.e. the hearing protection is either over- or under-protecting.

The warnings draw your attention to, for example:
- the risk of hearing damage for individual workers who have particular risk of hearing damage and
- the risks to safety if hearing protection makes warnings, communication or traffic difficult to hear.

In the example shown here, the job involves exposure to noise levels of 80, 86 and 95 dB(A). The daily personal noise exposure for the job is 87 dB(A) (from the **noise exposure action value calculator**), i.e. exposure is above the UEAV and hearing protection must be provided and its use managed.

Wearing hearing protection with an SNR of 19 dB during "Clear up" and "Set up" and not at all during "Main activity" results in a personal noise exposure at the protected ear equivalent to a daily personal noise exposure of 79 dB(A). The calculator warns of under-protection during "Clear up" but a higher attenuation model, e.g. SNR more than 23dB, would result in a warning of over-protection during "Set up".

Use of more than one protector type:

In some situtions hearing protectors with different attenuation values may be needed for different parts of the work activity. e.g. a high attenuation protector for a particularly noisy short-duration task, but a low attenuation protector is sufficient for the main work activity (with the added benefits of being more comfortable and being less likely to prevent audible warnings, mobile machinery and speech being heard).

The Exposure Limit Value Calculator only allows an SNR value for one type of hearing protection to be entered, so cannot be used directly where more than one type of protector has to be used by a worker. However the calculator can be used in two stages:

1. Use the calculator to determine the protected noise level for each task
2. Enter the protected noise level for each task in the "Noise level L_{Aeq}" column and leave the "Noise Level L_{Ceq}" and "HP worn?" columns blank (or set HP Worn? to "No").

"Reset" function:

- Clears all user-entered data in the current calculator page, i.e. SNR values and contents of the "Noise level (dB(A))", "Noise level (dB(C))", "HP worn?" and exposure time columns.

"**Copy values from Noise EAV Calculator**" button:

- If you want to use the data values in from the EAV calculator in this ELV calculator, this button will copy all A-weighted noise levels and all exposure time values.
- Any existing data in the current calculator will be lost.

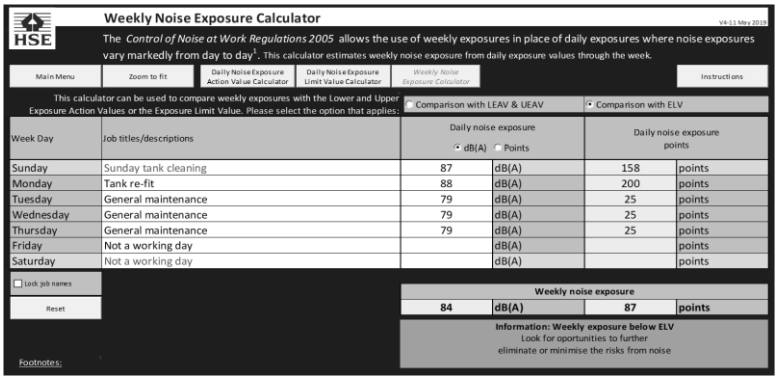
Weekly Noise Exposure Calculator

The ***Weekly Noise Exposure Calculator*** determines the weekly noise exposures entering either:

Daily personal noise exposures of the worker
(Select: "*Comparison with LEAV & UEAV*", or

Daily noise exposures at the ear of workers wearing hearing protection
(Select: "*Comparison with ELV*")

The calculations in both cases are the same, but the type of value entered affects whether the resultant weekly exposure is compared with either the EAVs or the ELV.



- Daily noise exposure values are entered by the user for each working day of the working week.
- Daily exposure may be entered as either points values or in dB(A) (set the units option in the table heading)
  NOTE: When the units option is changed, any values already entered will be converted to the new unit.
- The calculator shows the daily noise exposures in both dB(A) and points.
- The calculator shows the weekly noise exposure in dB(A) and points below the table.
- Warnings are shown a the bottom of the page depenednt on levels and whether the values are being compared to the EAVs or the ELV.

"Reset" function:

- Clears all user daily exposure entries in the visible calculator.
- If the "lock job names" option is not selected the job names are reset to "Job Sunday", "Job Monday", etc. .