



Australian Government
Comcare

Unfired Pressure Vessel Assessor
(Updated for June 2009)

A Microsoft Excel ® macro to assist with the assessment of unfired pressure vessels in relation to licences to operate them under Part 4 (Plant) of the *Occupational Health and Safety (Safety Standards) Regulations 1994*.

Unfired Pressure Vessel Assessor

(Updated for June 2009)

A licence to operate certain unfired pressure vessels is required under Part 4 (Plant) of the Occupational Health and Safety (Safety Standards) Regulations 1994. These pressure vessels are detailed under Item 1, of Part 2, of Schedule 6 of the Regulations.

From 1 July 2005, the Regulations require Australian Standard 4343-1999 to be followed when determining whether a licence is required.

This assessor (using a Microsoft Excel ® macro) has been developed to assist in determining whether or not a pressure vessel should be licensed. The assessor can be downloaded from Comcare's website at www.comcare.gov.au.

This assessor should NOT be used to assess Boilers.

Double click on the file "**Unfired Pressure Vessel Assessor - Macro**" or open the file from Microsoft Excel. The assessor should run automatically. If not, you may need to alter the security settings for Excel.

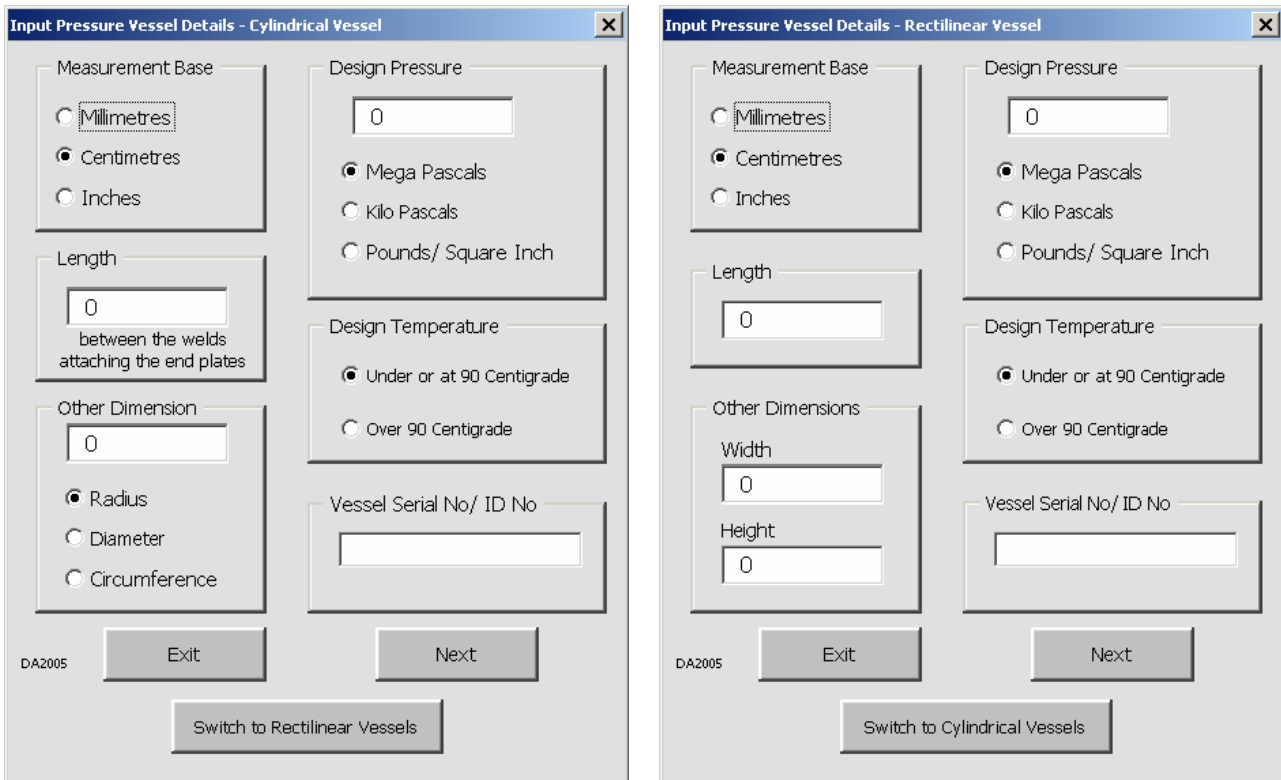
The opening screen.



You can assess "**Cylindrical Vessels**" or "**Rectilinear Vessels**".
Click on the relevant button.

Input Pressure Vessel details screens.

There is one input screen for cylindrical vessels and one for rectilinear vessels.



1. Select the unit of length measurement (Measurement Base) – defaults to Centimetres.
2. Input the length of the vessel *.
3. Input the other dimension(s). For cylindrical vessels you must specify whether this is Radius, Diameter or Circumference (whichever is easiest to measure) *.
4. Input the DESIGN PRESSURE and select the unit of measurement *.
NOTE: Design Pressure and Working Pressure can be assumed to be the same for most applications.
5. Select the DESIGN TEMPERATURE (or operating) range.
6. Input a serial number or letters to identify the pressure vessel on the printed results.

Note: Items 4, 5, and 6 should be found stamped on the hard shell of the vessel, or on a metal plate attached to the vessel. If not, seek advice from the manufacturer or supplier.

The assessor will convert dimensions to Metric units of measurement when determining the hazard level. The results are expressed in Metric units.

Click on "**Exit**" to stop the assessor and close Microsoft Excel, or

When you are satisfied that your input data is correct, click on "**Next**" * to continue with the assessment.

(* If details are not entered for dimensions and Design Pressure you will be prompted to enter them before proceeding.)

Input Service Factors screen

Input Service Factors

Factors appearing in AS 4343, Table 1, Note 4(a)
Check each item (i) to (iii) that applies
OR check item (iv)

Note 4(a)(i): Fired equipment (e.g. fired oil heater) but not boilers

Note 4(a)(ii): Equipment fitted with quick acting closures or doors

Note 4(a)(iii): Equipment sited in a facility that comes under the control of the Major Hazards Facility legislation (except where a risk assessment has established that a different hazard level should be adopted)

Note 4(a)(iv): Road tankers and transportable vessels

None of the above CLEAR

Back Exit Next DA 2005

The multiplication factors are listed in Australian Standard 4343-1999, Note 4(a) to Table 1.

Notes 4(a)(i) to (iii): If a single item applies, the multiplication factor is 3.
For two or more items, the multiplication factor is 10.

OR

Notes 4(a)(iv) Selecting this item overrides items (i) to (iii).
The multiplication factor is 3.

This screen allows you to select those factors (or none, which is the default condition).

Note

There is also a multiplication factor of 30 listed in Note 4(b). This is automatically applied if the Design Pressure exceeds 50 Mega Pascals (MPa). It overrides any factor selected on this screen.

Click on "**Exit**" to stop the assessor and close Microsoft Excel.

Click on "**Clear**" to remove all selected items.

Click on "**Back**" to return to the "**Input Pressure Vessel details**" screen.

Click on "**Next**" to continue.

Input Content details screen

The screenshot shows a software window titled "Input Contents details" with a close button (X) in the top right corner. The main content area is divided into four colored boxes representing hazard levels:

- LETHAL** (Red background):
 - Arsine
 - Sarin
- VERY HARMFUL** (Orange background):

All compressed or liquefied gases which are flammable, oxidising or toxic, e.g.

 - Chlorine
 - Carbon Monoxide
 - L.P.G.
 - Refrigerant Gas - Ammonia (R717)
 - Oxygen
 - Natural gas
 - Hydrogen Sulphide
- HARMFUL** (Yellow background):
 - Steam
 - Liquid Nitrogen
 - Liquid Carbon Dioxide
 - Liquid Helium
- NON-HARMFUL** (Green background):

All compressed gasses which are non-flammable or non-toxic, e.g.

 - Air
 - Carbon Dioxide
 - Nitrogen
 - Refrigerant Gasses R12, R22, & R134

Below these boxes, a reference text reads: "Refer to AS 4343-1999, Table 2 for detailed information about fluids (including gases) and their Hazard Type."

There are two selection panels:

- Hazard Type**:
 - Lethal
 - VeryHarmful
 - Harmful
 - Non-harmful
- Content Type**:
 - Gas
 - Liquid

Navigation buttons "Back" and "Next" are located on the right side. The identifier "DA2005" is in the bottom right corner.

This screen allows you to select the type and state of the contents of the pressure vessel.

1. Select the **Hazard Type**. Some examples of fluids (gases or liquids) in the various hazard types are given for your guidance. You may also need to refer to **Table 2 of AS 4343-1999** and the **Hazardous Substances Information System** found at <http://www.nohsc.gov.au/applications/hsis> for further information.
2. Select the **Content Type**, either gas or liquid.

Note: If the Design Temperature of the vessel is over 90° Centigrade, “Non-Harmful” gasses or liquids are rated as “Harmful” in accordance with the Standard. The Hazard Type will be automatically selected as “Harmful” in the above screen and shown as “Harmful” on the results screen and printout.

Click on "**Back**" if you need to return to the "**Input Service factors**" screen, or

Click on "**Next**" to complete the assessment and view the results.

Pressure Vessel Assessment Result screen.

Unfired Pressure Vessel Licensing Requirements
Occupational Health and Safety (Commonwealth Employment)
(National Standards) Regulations 1994 Part 4

Vessel ID/ Serial No **AACS-1332-AAX**

Vessel Configuration..... Cylindrical

Dimensions (cms) *. Length: 100.00 Radius: 20.00

Volume (Litres) *..... 125.7143

Design Pressure (MPa) *..... 30.00

Actual MegaPascal Litres (MPaL) *..... 3,771.4284

State of Contents Gas

Design Temp > 90 Degrees C False

Effective MegaPascal Litres (MPaL)* 37,714.284

*** Results are rounded to the number of decimal places displayed**

Hazard Type Non Harmful

Hazard Level B (Average)

Licence to Operate Required..... YES

The Vessel met more than one of the categories in AS 4343 Table 1, Notes 4(a)(i) to 4(a)(iii) and accordingly the Pressure/Volume of the vessel was multiplied by 10

Results should be confirmed by reference to the above Regulations and Australian Standard 4343-1999, in conjunction with the Australian Dangerous Goods (ADG) Code, NOHSC:1005(1994) & 1008(2004). The manufacturer or supplier of the contents of the pressure vessel should be able to provide a data report which quotes the hazard level.

PRINT RERUN CYLINDRICAL EXIT

RERUN RECTILINEAR

The result of the assessment is presented as shown above. All linear measurements are converted into Centimetres (cms), volumes to Litres, and pressures to Mega Pascals (MPa). **Note that the calculated Mega Pascal/ Litre (MPaL) values are rounded up to the number of decimal places shown on the screen. This may result in slight inconsistencies between the displayed values. The unrounded values are used in determining whether or not a vessel should be licensed.**

Click on **"Print"** to print this result on the default printer. You may want to keep the 'hard copy' for your records.

Click on **"Rerun Cylindrical"** or **"Rerun Rectilinear"** to return to the relevant **"Input Pressure Vessel Details"** screen if you need to perform an assessment for another pressure vessel. (Note: the details that you have previously entered are preserved so that if you want to create a printed record for a range of similar vessels, you only have to make minimal changes to obtain a result for each vessel).

Click on **"Exit"** to stop the assessor and close Microsoft Excel.