## TankAssessor™ - Entry Criteria

**Industrial route: Typically 5 years' experience consistently working in inspection & maintenance of storage tanks (in excess of 150m3), plus ability to deal with scientific formulae and calculations**

*OR*

**Academic route: Engineering Degree (e.g. BSc) from a recognised university, plus a minimum of 1 years' experience consistently working in inspection & maintenance of storage tanks (in excess of 150m3), plus ability to deal with scientific formulae and calculations.**

## TankAssessor™ - Typical Calculations

**The following are examples of the kind of calculations / formulae covered in the TankAssessor™ course and may be encountered in the examinations (note: this is an illustration, not a test):**

Transpose the actual height '*h*' of each shell course to an equivalent height '$H_e$' of thickness '$t_{min}$' using the following equation:

$$H_e = h\sqrt{\left(\frac{t_{min}}{t}\right)^5}$$

Where:

| | | |
|---|---|---|
| $t_{min}$ | = | corroded thickness of the top course (in mm) |
| $t$ | = | corroded thickness of each shell course (in mm) |
| $h$ | = | actual height of each shell course (in m) |
| $H_e$ | = | transposed height of each shell course (in m) |

Calculate transformed shell height: $HE = \sum H_e$

Note: The transformed shell has a uniform thickness '$t_{min}$' and a height '$H_e$' which provides equivalent stability as the actual shell with variable thicknesses and a top course thickness equal to '$t_{min}$'.

Calculate factor '*K*' using the following equation:

$$K = \frac{9500}{3.563Vw^2 + 580Va}$$

Calculate maximum permitted spacing '$H_p$' of stiffner rings on transformed shell in (m):

$$H_p = K\sqrt{\left(t_{min}^5/D^3\right)}$$

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The following formula is widely used to calculate the maximum permissible sag:

$$f_{max} = \frac{d}{100}\sqrt{\left(\frac{f_0 * 100}{D}\right)^2 + 3280 * \frac{Re}{K}}$$

Where:

$f_{max}$ = maximum allowed sag of deformed section in bottom in mm
d = deformed section in bottom in mm
$f_0$ = original sag in bottom since construction (either cone up or cone down) in mm
D = diameter of tank in mm
Re = Yield strength of bottom plate materials with maximum of 240 N/mm$^2$
K = Young's modulus of steel at storage temperature in N/mm$^2$

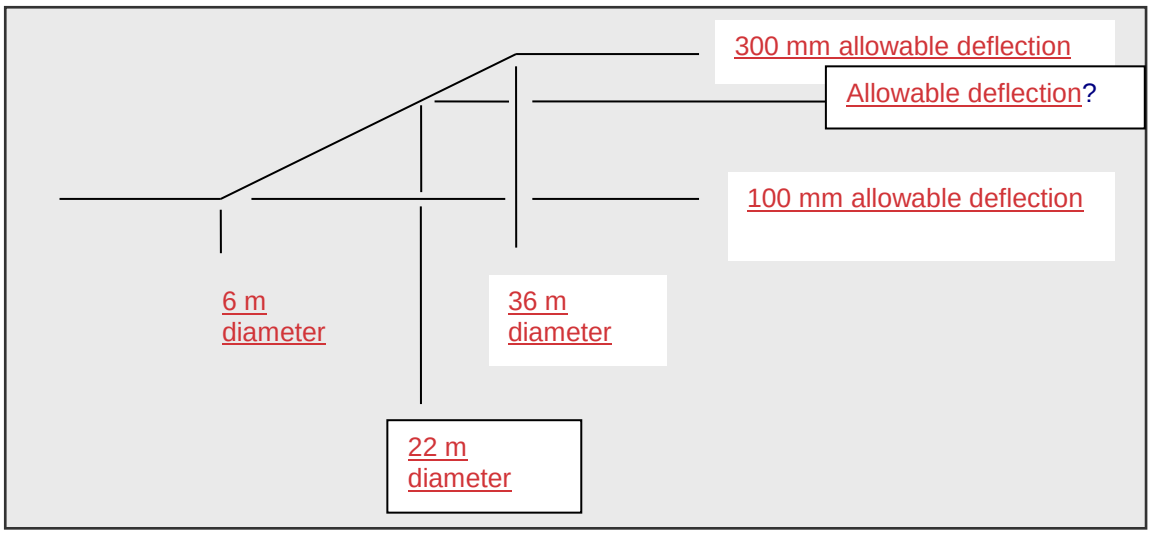
Assess the value from the formulae stipulated below:

$$H_p = K\sqrt{\frac{t^5}{D^3}} = \frac{t^{2.5}}{D^{1.5}}$$

And

$$K = \frac{95000}{\left(3.563V_w{}^2 + 580V_a\right)}$$

Use a calculator to assess the values within the graphic shown below:




**If you find the above questions or formulae difficult, you should consider getting some tuition in scientific formulae and calculations, or use of a scientific calculator, prior to attending TankAssessor™.**