**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 ‘\( t_{\text{min}} \)’ using the following equation:

\[
H_e = h \sqrt{\frac{t_{\text{min}}}{t}}
\]

Where:

- \( t_{\text{min}} \) = 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: \( H_E = \sum H_e \)

Note: The transformed shell has a uniform thickness ‘\( t_{\text{min}} \)’ and a height ‘\( H_e \)’ which provides equivalent stability as the actual shell with variable thicknesses and a top course thickness equal to ‘\( t_{\text{min}} \)’.

Calculate factor ‘\( K \)’ using the following equation:

\[
K = \frac{9500}{3.563Vw^2 + 580Vd}
\]

Calculate maximum permitted spacing ‘\( H_p \)’ of stiffner rings on transformed shell in (m):

\[
H_p = K \sqrt{\frac{t_{\text{min}}^5}{D^3}}
\]

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

\[
f_{\text{max}} = \frac{d}{100} \sqrt{\left(\frac{f_2 \times 100}{D}\right)^2 + 3280 \times \frac{Re}{K}}
\]
Where:

- $f_{\text{max}}$ = 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
- $R_e$ = 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:

$$H_p = K \sqrt[6]{\frac{t^5}{D^3}} = \frac{t^{2.5}}{D^{1.5}}$$

And

$$K = \frac{95000}{(3.563 \nu_w^2 + 580 \nu_a)}$$

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™.