

ASME VIII

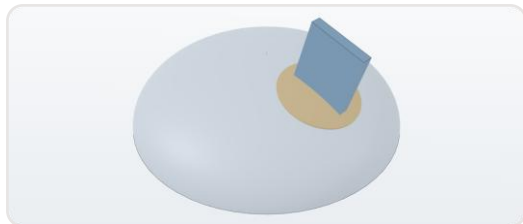
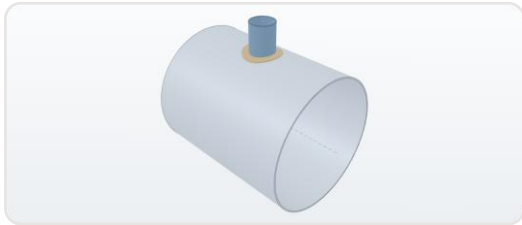
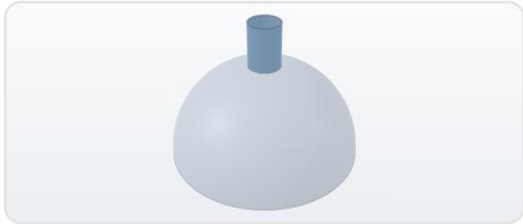
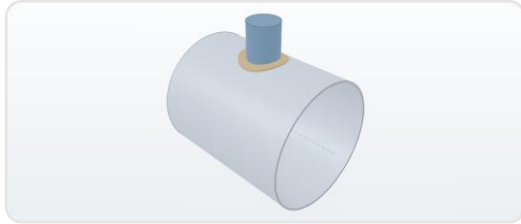
AS 1210

PD 5500

What do these three have in common?



DESIGN



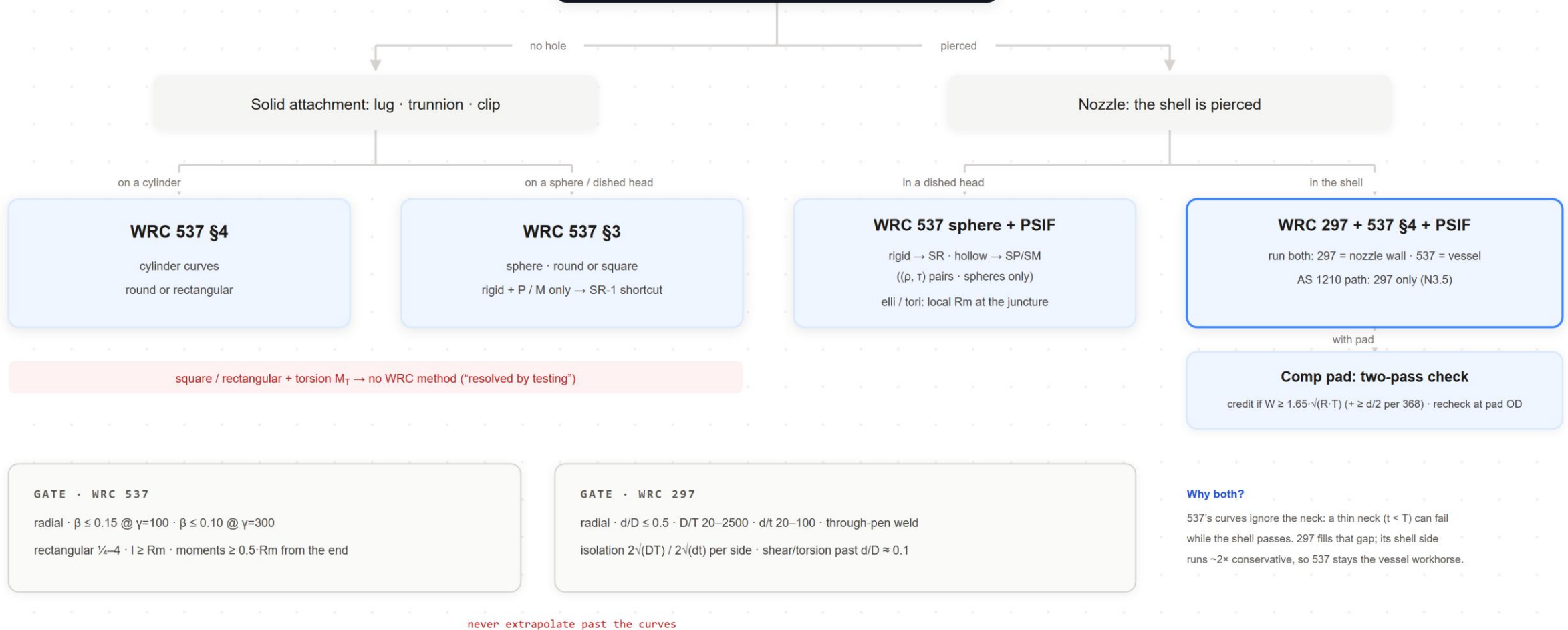
REALITY



WRC 107 (537) & 297

Which WRC document, when

External load on a nozzle / attachment



outside a gate / flat heads / hillside / multi-nozzle → FEA · code routers · fatigue · load cases → handout ↘

Why both?

537's curves ignore the neck: a thin neck ($t < T$) can fail while the shell passes. 297 fills that gap; its shell side runs ~2× conservative, so 537 stays the vessel workhorse.



Inside the calc

inputs, from the geometry

$r_o=125$

$R_m=437.5$

$T=6.25$

$F = 10 \text{ kN (mm)}$

$\beta = 0.875 \cdot r_o / R_m = 0.25$

$\gamma = R_m / T = 70$

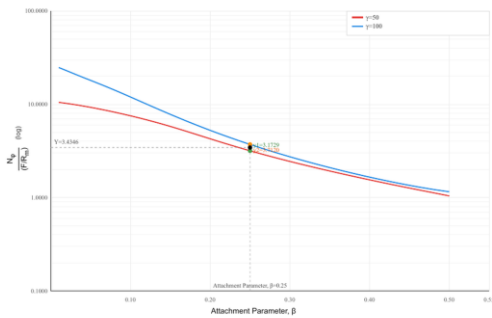


Figure B.13 WRC 537 Figure 3C at $\beta=0.2500$, $\gamma=70$

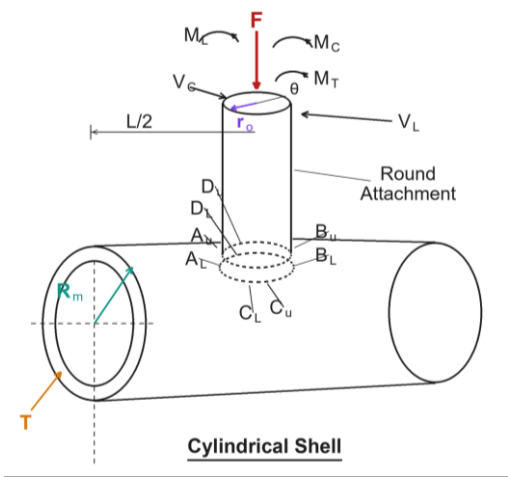
As shown in Figure B.13, $\frac{N_\theta}{F/R_m} = 3.4346$ at $\beta = 0.2500$, per Equation (B.1); see Table B.1 for the full results summary.



$$\sigma_{\theta,m}(F) = K_n \left(\frac{N_\theta}{F/R_m} \right) \frac{F}{R_m T}$$
$$= 1.0 \cdot (3.43) \frac{10\,000 \text{ N}}{437.5 \cdot 6.25 \text{ mm}^2} \approx 12.6 \text{ MPa}$$

Eq. C.10 (report App C) · $K_n = 1.0$

WRC 537 Fig. 3C: read at β between two γ curves



$\sigma_{\theta,m}(F) \approx 12.6 \text{ MPa}$ · one read of 12 · at 8 points · WRC 297 adds 56 + 2 figures

Back to Phosphate Hill

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the decision tree (blog)



worked example #1: comp pad



try PV Cloud