Curso Online: Lección 7
Diseño por Presión Exterior

Casos de Estudio Resueltos
# Cylindrical Shell Design

**BPVC ASME VIII DIV.1**

**Eqpt: PV-01 External Pressure Calculation**

## Design Conditions

- **97** °C - External Design Temperature
- **0.1013** MPa - External pressure
- **3.0** mm - internal corrosion allowance
- **0.0** mm - external corrosion allowance

## Dimensions:

- **2800** mm - inside diameter
- **2840** mm - outside diameter
- **17** mm - nominal wall thickness w/o CA
- **710** mm - height of heads
- **11000** mm - TL to TL length
- **11473** mm - Distance between lines of support

## Material and Conditions:

- **SA-285 Gr.C** - Wall Product form
- **CS-1** - External Pressure Chart
- **198,000** MPa - moduli of Elasticity @design Tº (II-D TM-1)
- **189** MPa - yield strength @design Tº (II-D Y-1)
- **108** MPa - allowable stress
- **0.30** mm - under tolerances (SA-20)

## Parameters & Factors:

**Dot** [mm] = Do / t external diameter - nominal thickness ratio

**LDo** [mm] = L / Do distance between supports - external diameter ratio

- Factor determined from figure G (II-D, part 3) = 0.00014
- Factor determined from figure CS-1 (II-D, part 3) = NA

## External Pressure Calculation: UG-28 (c)

- **Pa** [MPa] = If Do / t ≥ 10
  - 4*B / 3*(Do / t) - allowable external pressure when B is known for Do / t ≥ 10 = 0.1098
  - 2*A*E / 3*(Do / t) - allowable external pressure when B is unknown for Do / t ≥ 10 = 0.1087

- **Pa1** [MPa] = (2,167/(Do / t)-0.0833)*B - allowable external pressure for Do / t < 10 = NA

- **Pa2** [MPa] = (2*S/(Do / t))*(1-(Do / t)) - allowable external pressure for Do / t < 10 = NA

- **Pa** [MPa] = Allowable external pressure for Do / t ≥ 10 = 0.1087

**Check Pa = Pa > Pe** 0.1087 > 0.1013 = Acceptable

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This sheet provides maximum allowable external pressure only, no other external loads considered.
The UG-16(b) minimum thickness requirement has not been taken into consideration here.
This sheet cannot be used to check for allowable interior pressure loads.
This sheet is for educational use only - use at your own risk.