Pressure vessel design optimization

Sara Cárcel García
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OVERVIEW

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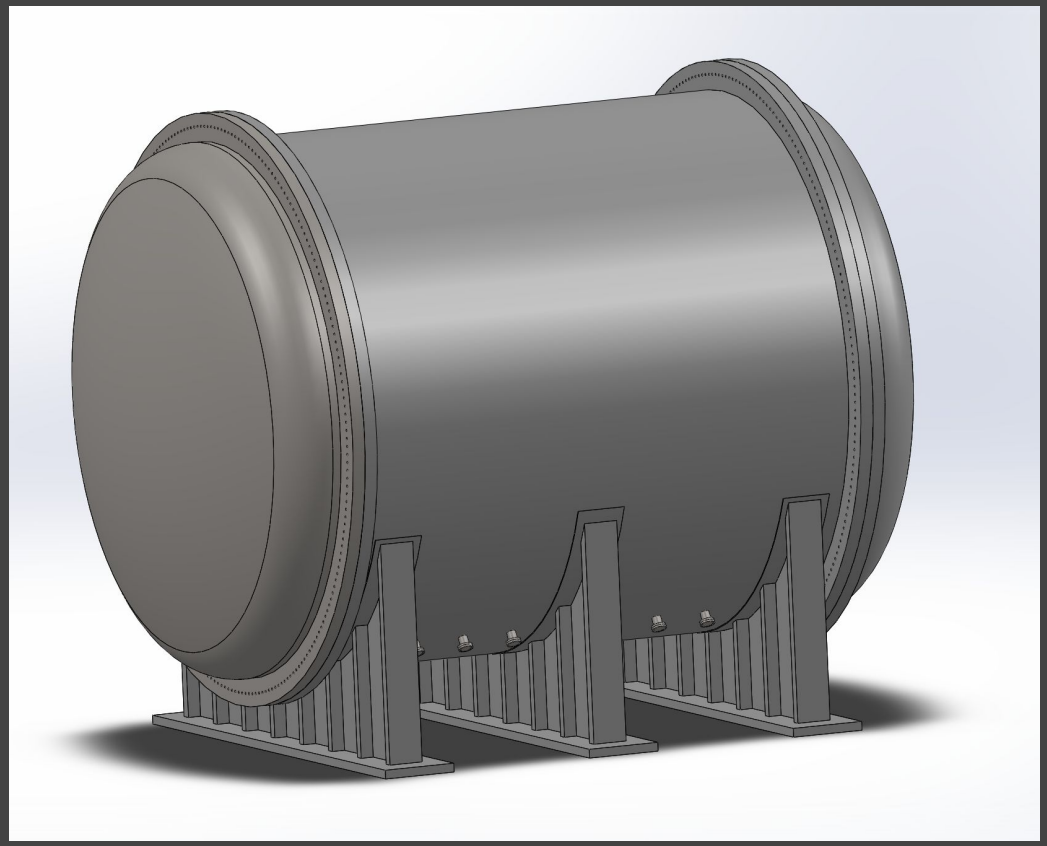
2. Calculations
3. Thickness- 316Ti
4. Thickness- P355 NH
5. Manufacturing and shipment
6. Manufacturing companies
7. Time schedule: quote and delivery time

1-Pressure Vessel

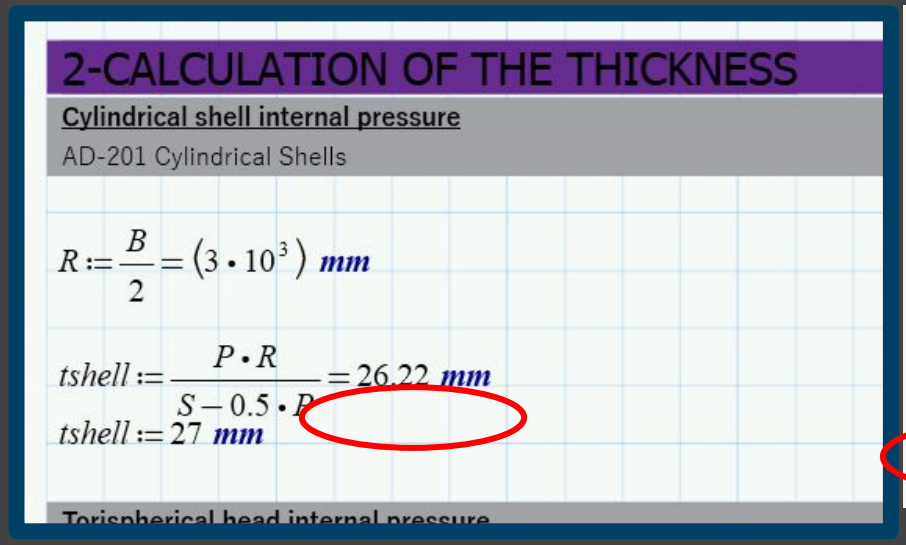
- Pressure: 1.2 MPa (175 psi)
- Internal diameter: 6 m
- Length shell: 6 m



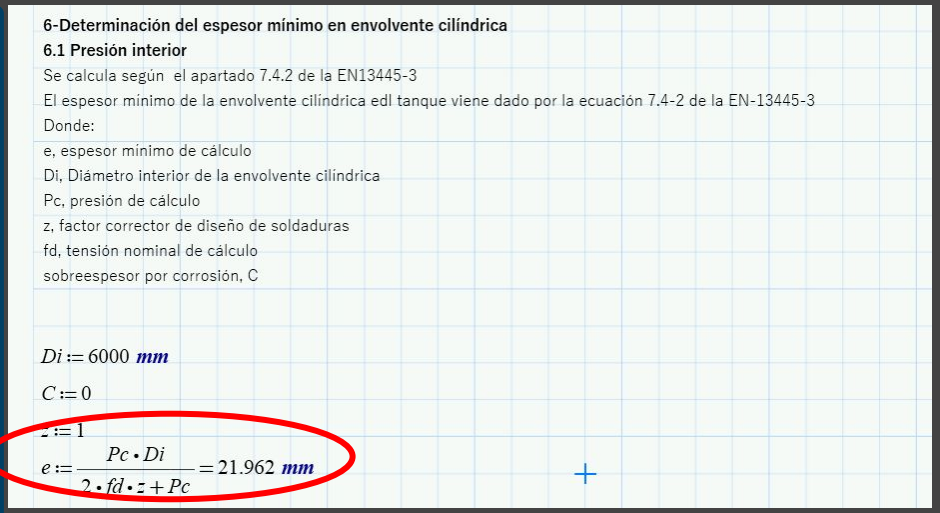
2.Calculations

- European rules (AD-2000 or EN-13445) allow thinner thicknesses than ASME VIII Divison 1, but they are only small differences in thickness.

ASME VIII Division 1



EN 13445



3.Thickness-Inox (316 Ti)

- EN-13445

-Shell thickness: 22 mm
-Torispherical head thickness: 37 mm
-Flange thickness: 150 mm (flat to flat contact using elastomer gasket. If we use a metal gasket, the thickness will be bigger)

4.Thickness-Carbon steel (P355 NH)

- EN-13445

-Shell thickness: 11 mm
-Torispherical head thickness: 21 mm
-Flange thickness: To check (it is not finished)

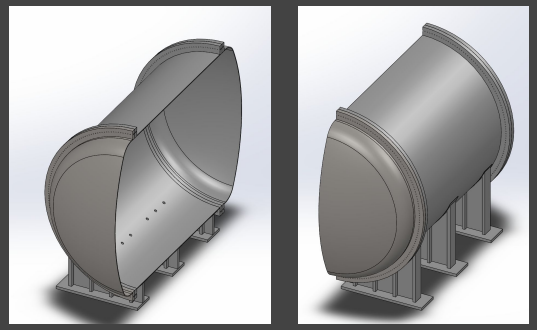
Tha vacuum could be: 10^-2 mbar

Tipo de acero		Estado normal de suministro	Límite elástico ReH mínimo en N/mm² para un espesor del producto en mm						Resistencia a la tracción, Rm en N/mm² Espesor de producto en mm			Alargam. A mínimo, después de rotura, en % (Lo=5,65 VSo) Espesor nominal en mm	
Designación													
Simbólica	Numérica		≤ 16	> 16 ≤ 35	> 35 ≤ 50	> 50 ≤ 70	> 70 ≤ 100	> 100 ≤ 150	≤ 70	> 70 ≤ 100	> 100 ≤ 150	≤ 70	> 70 ≤ 150
P335 N	1.0562	Normalizado (Ver norma)	355	355	345	325	315	295	490 a 630	470 a 610	450 a 590	22	21
P355 NH	1.0565	Normalizado (Ver norma)	355	355	345	325	315	295	490 a 630	470 a 610	450 a 590	22	21

If you need a stainless steel chamber, but with thickness similar to the P355 NH carbon steel, we could use a cold stretching inox steel

5.Manufacturing and shipment

- 6 m of the internal diameter (ID) is a problem for the manufacturing and shipment
  - The final assembly would be in the consumer installations (2 parts to weld in the consumer installations)



Could be 4 m of ID? Or could be 2 chambers?

- The thickness would be less
- Easier to make the shipment
- Final assembly in the manufacturing company

6. Manufacturing companies

Praxair
Santiago Bronchal
Project Engineer Teruel Plant
Tlf: + 34 978 61 72 06; Movil : 629 28 42 32

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ACYM
Tubería y Calderería, S.L.
Trabajos en Acero Inoxidable y Acero Carbono

Pol. Ind. ALBOLLEQUE
C/ Los Muchos nº5
19160 CHILOECHES (Guadalajara)
Telf. Y Fax: 949 36 68 04
e-mail: acym.caldereriaytuberia@gmail.com

7. Time schedule: quote and delivery time

- Clarify the doubts:
  -If we can design two chambers with the same volume as the original vessel, or if we can design one chamber with 4 m of ID and longer (volumen as the original vessel)
  -Materials: We can considerer two or more materials to ask a budget **(Tomorrow?)**
- Calculations **(Finished the next week)**
- Send the drawing to the company **(To send the next week)**

APPROXIMATE QUOTE AND DELIVERY TIME: IN THE END OF JANUARY