

Page: 1 of: 2
 Date: 21-03-2011 Name: HdG
 Client: DeMaCo
 Title: Aluminum shell NIKHEF
 Drawing number:
 Job number: 11-0082C
 Job-filename: 11-0082C rev 0

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Stress - analysis

AD-2000-B6:Cylindrical shells subjected to external pressure, issue 10/2006

Loadcase	Testing		
Nominal diameter	DN	1100	
External test pressure	PT	1,00	bar
Temperature	T	20,00	°Celsius

Permitted range

Da/Di =1,0219 <= 1.2 satisfied

Material Data

Chosen material	AlMg3 W19		
Type	Plate		
References	AD W6.1 1.90		
Tensile stress	RmRT	190,00	N/mm ²
0.2%-Yield-stress	Rp02,T	80,00	N/mm ²
Safety factor	S	1,10	--
Permissible stress	K/S	72,73	N/mm ²
Safety factor	Sk(')	2,20	--
Young's modulus	E	70000,00	N/mm ²

Allowances

Shell tolerance	c1	0,00	mm
Corrosion allowance	c2	0,00	mm

Geometrical data

External diameter	Da	1120,00	mm
Actual shell thickness	se	12,00	mm
Buckling length	l	2000,00	mm
Number of ridges	n	4	--
Flattening	u	1,50	%
Parameter	Z	0,87965	--
Parameter	Da/l	0,56000	--

Pressure

Elastic buckl. pressure	p1	5,67	bar
Plastic buckl. pressure	p2	5,44	bar
Design pressure	p	1,00	bar

--> no buckling

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Stress - analysis

AD-2000-B6:Cylindrical shells subjected to external pressure, issue 10/2006

Loadcase	Testing		
Nominal diameter	DN	950	
External test pressure	PT	1,00	bar
Temperature	T	20,00	°Celsius

Permitted range

Da/Di =1,0326 <= 1.2 satisfied

Material Data

Chosen material	AlMg3 W19		
Type	Plate		
References	AD W6.1 1.90		
Tensile stress	RmRT	190,00	N/mm ²
0.2%-Yield-stress	Rp02,T	80,00	N/mm ²
Safety factor	S	1,10	--
Permissible stress	K/S	72,73	N/mm ²
Safety factor	Sk(')	2,20	--
Young's modulus	E	70000,00	N/mm ²

Allowances

Shell tolerance	c1	0,00	mm
Corrosion allowance	c2	0,00	mm

Geometrical data

External diameter	Da	950,00	mm
Actual shell thickness	se	15,00	mm
Buckling length	l	2000,00	mm
Number of ridges	n	3	--
Flattening	u	1,50	%
Parameter	Z	0,74613	--
Parameter	Da/l	0,47500	--

Pressure

Elastic buckl. pressure	p1	12,50	bar
Plastic buckl. pressure	p2	10,03	bar
Design pressure	p	1,00	bar

--> no buckling