Vessel Under Internal Pressure

PREPARED: P.G.A.Engineering
CHECKED:
APPROVED:
DATE: 29/04/2014

This calculation is according to ASME VIII Div.1 App.2

Outside Diameter of Vessel		6	
Schedula Number		40	
Pipe Material		A240 316L (Plate)	
Joint Description		Butt joints as attained by double-welding or by other means which will	
Degree of Radiographic Examination		NONE	
Design Pression	P	3,5	bar
Test Pression	P_{TEST}	5	bar
Maximum Temperature	T_{MAX}	50	°C
Minimum Temperature	T_{MIN}	4	°C
Test Temperature	T_{TEST}	20	°C
Corrosion Allowance	c	0,0	mm

CALCULATION

DESCRIPTION	DEF.	Imperial		Metric	
		Values	Unit of Measure	Values	Unit of Measure
INPUT					
Outside Diameter of Pipe	DN	6,626	in	168,30	mm
Pipe Wall Thickness	t	0,280	in	7,11	mm
Pipe Inside Radius	R	3,033	in	77,04	mm
Corrosion Allowance	c	0,000	in	0,00	mm
Design Pressure	P	51	psi	0,35	MPa
Design Pressure at Test Temperature	P_{TEST}	73	psi	0,50	MPa
Maximum Temperature	T_{MAX}	122	°F	50	°C
Minimum Temperature	T_{MIN}	39,2	°F	4	°C
Test Temperature	T_{TEST}	68	°F	20	°C
Allowable Pipe Stress at Operating Condition	$S_{P,OP}$	16150	psi	111	MPa
Allowable Pipe Stress at Test Temperature	$S_{P,TEST}$	25000	psi	172	MPa
Joint Efficiency Factor	J	0,7	-	0,7	-

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DESCRIPTION	DEF.	Imperial		Metric	
		Values	Unit of Measure	Values	Unit of Measure
OUTPUT					
Minimum Thickness for Cicumferential Stress (Longitudinal Joints)	$t_{CS,OP}$	0,014	in	0,35	mm
Minimum Thickness for Cicumferential Stress (Longitudinal Joints) at Test Condition	$t_{CS,TEST}$	0,013	in	0,32	mm
Minimum Thickness for Longitudinal Stress (Circunferential Joints)	$t_{LS,OP}$	0,014	in	0,35	mm
Minimum Thickness for Longitudinal Stress (Circumferential Joints) at Test Condition	$t_{LS,TEST}$	0,013	in	0,32	mm
Minimum Thickness Required	t	0,014	in	0,35	mm
Minimum Thickness Garanteed	t_G	0,245	in	6,22	mm

VERIFICATION

Description	Formula	CHECK
Minimum Thickness Verification	$t_G \geq t$	VERO
Condition for Circumferential Stress Formula Applicability	$t \leq R/2$	VERO
Condition for Longitudinal Stress Formula Applicability	$t \leq R/2$	VERO

P.G.A. Engineering di Provini Gabriele - Via Emilia Parmense, 42 - 29010 Fontana Fredda di Cadeo (PC)
Tel./Fax: +39 0523 072430 - E-mail info@pgaengineering.it - Web: http://www.pgaengineering.it