ASME SEC. VIII DIV.1 STRENGTH CALCULATION

CYLINDERICAL SHELL THICKNESS

INPUT DATA 계산실행 ***1.0***

* DESCRIPTION		
* ITEM NO.		
* INTERNAL DESIGN PRESSURE	4.5	Kg/cm^2
* EXTERNAL DESIGN PRESSURE	1.05	Kg/cm^2
* INSIDE RADIUS (CORRODED)	1524	mm
* JOINT EFFICIENCY	1.0	
* CORROSION ALLOWANCE	2	mm
* DESIGN TEMPERATURE	300	°F
* MATERIAL	A516-70	
* MATERIAL SELECTION FOR EXTERNAL PRESSURE CHECK	C.S	
* DESIGN LENGTH FOR EXTERNAL PRESSURE CHECK	2438	mm
* SHELL USED THICKNESS	12	mm

RESULT OF CALCULATION

RESULT OF THICKNESS CALCULATION

* Used thickness check for internal pressure	O.K	
* Used thickness check for external pressure	O.K	

THICKNESS FOR INTERNAL PRESSURE

[A] Per UG-27 (C)(1) CIRCUMFERENTIAL STRESS (LONG.SEAM)

** Allowable stress @ Design Temp.	1,406.1	Kg/cm^2
** Allowable stress @ Room Temp.	1,406.1	Kg/cm^2
** Circumferential stress, P < 0.385 SE =	541.4	Kg/cm^2
** Stress check	O.K	
** Min. required thickness ; t1 = PR/(SE-0.6P)		
=(4.5*1524)/((1,406.14*1.0)-(0.6*4.5))	4.89	mm

[B] Per UG-27 (C)(2) LONGITUDINAL STRESS (CIRCUM.SEAM)

** Circumferential stress, P < 1.25 SE =	1,757.7	Kg/cm^2
** Stress check	O.K	
** Min. required thickness ; t2 = PR/(2SE+0.4P)		
=(4.5*1524)/((2*1,406.14*1.0)+(0.4*4.5))	2.44	mm

[C] MINIMUM DESIGN TH'K

** Shell Mininum thickness as per UG-16(b), t3+C	3.60	mm
** Shell Min. required Thickness, t = The larger of t1 or t2 or t3 + C	6.89	mm

** MAWP(NEW&COLD)=SEt/R+0.6t		
=1,406.14*1.0*12/((1524-2)+(0.6*12))	11.0	Kg/cm^2
** MAWP(HOTD)=SEt-C/R+0.6t-C		
=1,406.14*1.0*(12-2)/(1524+(0.6*(12-2)))	9.2	Kg/cm^2

THICKNESS FOR EXTERNAL PRESSURE

** Modulus Elasticity	2,038,903	Kg/cm^2
** The ratio of outside dia./Shell thickness, Ratio1	306.8	
** The ratio of design length /outside dia., Ratio2	0.795	
** Factor "A"	0.0003125	
** Factor "B"	313	Kg/cm^2
** Max. allowable external pressure,(4*Factor "B")/(3*Ratio1)	1.360	Kg/cm^2

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