PRESSURE VESSEL DESIGN

PLATFORM-STRUCTURE FOR HORIZONTAL VESSEL

INPUT DATA 계산실행 ***V1.0***

GENERAL INFORMATION

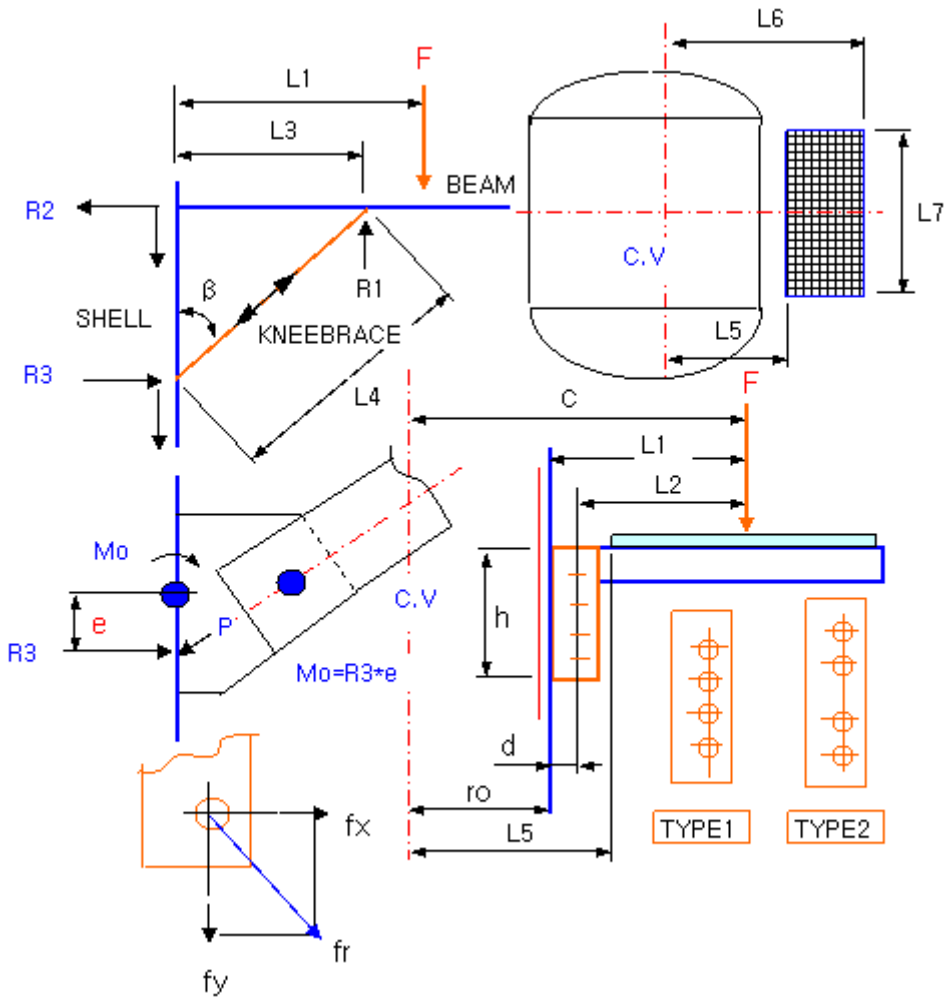
* Description	PES21	* Item No.	E-2007
* DWG No.	PE-DW-DU-01	* Part No.	E9

PLATFORM DESIGN DATA

* Platform Distance from Vessel C.L to outside, L6	1524	mm	* Platform Distance from Vessel C.L to inside, L5	750
* Platform Dead Load per one support beam,Dw	200	Kgf	* Platform Live load per one support beam, Lw	300
* Vessel outside radius,ro	600	mm	* Vessel outside to Support clip bolt hole,d	75
* K=End connection coefficient(1.0)	1.0		* Kneebrace distance from vessel, L3	300
* β=Kneebrace Angle	45	0	* Platform length, L7	2000
* Support bracket Bolt Q'ty,Q	4	EA		
* Support bracket type	TYPE2		* Bolt Material	A325
* Support beam size	ㄷ150x75x6.5x10		* Bolt size	M20
* Kneebrace size-ANGLE	ㄱ75x75x6		* Grating Max. distance based on 30x5	1200

PLATFORM SUPPORT CLIP DESIGN DATA

* Platform Clip thickness, t	13	mm	* Platform Clip Height, h	200
* Platform Clip material	SS400			



RESULT OF CALCULATION

SUPPORT BEAM & KNEEBRACE UNIT WEIGHT

* Support beam unit weight	18.6	Kg	* Kneebrace unit weight	6.9

PLATFORM LOAD CALCULATION

* Applied load, F=Dw+Lw	500.0	Kgf	* Load area, A=(L6-L5)*L7	464,400.0
* C=Distance of C.G,L5+((L6-L5)/2)	1,137.0	mm	* L1=C-ro	387.0
* L2=L1-d	312.0	mm	* L4=L3/(sin(90-β))	424.4
* M1=L1*F	193,500	Kgf-mm	* M2=L2*F	156,000
* fx=Cf*M2	10,296	Kgf	* fy=F/Q	125
* fr=(fx^2+fy^2)^0.5	10,297	Kgf	* r'=Radius of gyration	750.0

SUPPORT BEAM STRESS CHECK

* Reaction Force, R1=L1*F/L3=M1/L3	645	Kgf	* Shear Load / Radial Load on shell=R2=R3=R1*Tan(β)	644
* Section modulus of beam, Z	115,000	mm^3	* Bearing stress in beam=fb=((L1-L3)*F)/Z	0.378

* Allowable stress, Fa1	15.039	Kgf/mm^2	* Stress check	O.K

KNEEBRACE STRESS CHECK

* Axial load in Kneebrace=P=R1/cos (β)	912	Kgf	* A'= Cross sectional area of kneebrace	873
* Axial stress, fa= P/A'	1.045	Kgf/mm^2	* Slenderness ratio KL4/r'	0.6
* Allowable stress, Fa2	15.039	Kgf/mm^2	* Stress check	O.K

ALLOWABLE GRATING LOAD

* Allowable uniform load per m^2	446	Kgf	* Allowable conncentrated load per m^2	405

ALLOWABLE BOLT LOAD

* Allowable bolt load per one bolt	4,218	Kgf	* Allowable bolt load per support bracket	16,872
			* Allowable bolt load check	O.K

PLATFORM SUPPORT CLIP THCIKNESS

* Yield stress,sy	21.092	Kg/mm^2	* Vertical Load on support clip,P	500
* Moment, M2=F*d	37,500	Kgf-mm	* Moment of interial. Ixy=t*h^3/12	8,666,667
* Section modulus, Z=Ixy / y	86,667	mm^3	* Stress in platform clip, S=M2/Z	0.433
* Allowable stress of platform clip, Sa=sy*0.9	18.983	kg/mm^2	* Allowable stress check	O.K

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