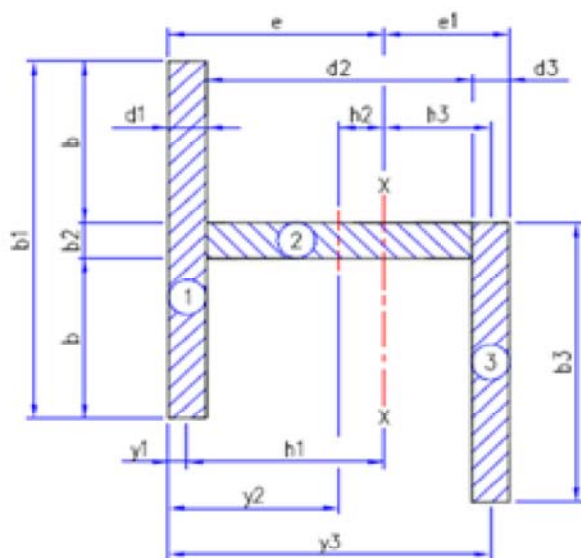


## API650 STRENGTH CALCULATION

### TOP ANGLE SELECTION (API 650)

**INPUT DATA** 계산실행 V.1.0 Pgm By C.M. Ryu/P.E

* DESCRIPTION	PES21	* ITEM NO.	E-104		
* Inside Diameter, D	43.0	m	* Inside radius of tank shell (Corroded), Rc	21503	mm
* Thickness of top shell course (Corroded), Tc	7	mm	* Thickness of roof plate (Corroded), Th	5	mm
* Cone Angle, $\Theta = Rc/\sin(\Theta)$	3.6	Deg	* Top Angle Material	A36	
* Min. yield strength of Top Angle, Fy	248	Mpa	* Reduction Factor, ks	1	
* Applied Roof Load, Pd	2.38	kPa	* Rafter unit weight, Wg	5.3	N/cm
* Rafter quantity at point 1, Rn1	72	ea	* Rafter quantity at point 2, Rn2	24	ea
	22			175	
	200			22	



### RESULT OF CALCULATION

* Allowable stress, $F_s = 0.66 \cdot F_y \cdot k_s$	163.7	Mpa	* Applied roof load, Pd	0.238	N/cm <sup>2</sup>
* Tank diameter, D1	43,000.0	mm	* Cone roof angle, theta	0.0628	rad
* Length of cone element to horizontal, $R_2 = Rc/\sin(\Theta)$	342,456.4	mm	* Allowable stress, Sa	1,670.2	kgf/cm <sup>2</sup>
* Effective Width, $b_1 = 13.4 \cdot (D \cdot t_a)^{0.5}$				232.48	mm

Vhfwlrqdd# rgxoxv

A\*y

A\*h<sup>2</sup>

Mark	b(cm)	A(cm <sup>2</sup> )	y(cm)	(cm <sup>3</sup> )	h(cm)	(cm <sup>4</sup> )	Ig(cm <sup>4</sup> )
1	23.25	16.27	0.35	5.70	11.99	2,338.9	0.66
2	2.20	38.50	9.45	363.83	2.89	321.23	982.55
3	20.00	44.00	19.30	849.20	6.96	2,132.3	17.75
Total		98.77		1,218.7		4,792.4	1,000.9

- 1) 도심까지거리 :  $\sum AY / \sum A = e$  12.34 cm
- 2) 관성모멘트 :  $AH^2 + Ig = I$  5,793.46 cm<sup>4</sup>
- 3) 유효 단면계수 :  $I/e = Za$  469.54 cm<sup>3</sup>
- 4) Triangular distribution of transverse load (w), =  $\{\pi \cdot (D/2)^2 \cdot pd / (Rn \cdot Rc)\} + Wg$  27.6 N/cm
- 5) Horizontal load (H) =  $w \cdot Rc \cdot \cos(Rs) / 9.8$  6,047 Kgf
- 6)  $S = \pi / Rn^2$  0.131 rad
- 7) Bending and tensile stress on load point (F1) =  $H \cdot D / 40 \cdot (1/S - 1/\tan(S) \cdot 1/Z + H/(2 \cdot \tan(S) \cdot A))$  837 Kgf/cm<sup>2</sup>
- 8) Bending and tensile stress on interm. Load point (F2) =  $H \cdot D / 40 \cdot (1/\sin(S) - 1/S \cdot 1/Z + H/(2 \cdot \sin(S) \cdot A))$  537 Kgf/cm<sup>2</sup>
- 9) F : Max. stress greater between F1 and F2 837 Kgf/cm<sup>2</sup>
- 10) Stress Check, F is less than Allowable stress, Sa then O.K O.K

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