



PROJECT :			DATE :	
PROJ. NO.:			BY :	S.Rahimi
CLIENT :			REV :	
UNIT :			DOC NO.:	

Relief Valve Sizing for Two-Phase Flashing or Non-flashing Flow

Input Data		
Required Relieving Rate	lb/hr	220000.0
PSV Set Pressure	psig	217.50
Allowable Overpressure	%	10.0
Relieving Temperature	R	771.00
Back Pressure	psig	15.00
Mass Density @ Relieving Pressure	lb/ft3	7.59
Mass Density @ 90% of Relieving Pressure	lb/ft3	6.12
Kd	----	0.85
Kb	----	1.00
Kc	----	1.00
Kv	----	1.00

Calculation Results		
Relieving Pressure (Po)	psia	253.95
Back Pressure (Pb)	psia	29.70
ω	----	2.161
$\eta_c = P_c/P_o$	----	0.702
Critical Pressure (Pc)	psia	178.16
Flow Regime	----	Critical
used Pb	psia	178.16
Mass Flux (G)	lb/s ft2	1426.6
Required Area for PRV	in2	7.3

Notes

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Relief Valve Sizing for Subcooled Liquid Flashing Flow

Input Data		
Required Relieving Rate	gal/min	100.0000
PSV Set Pressure	psig	260.00
Allowable Overpressure	%	10.00
Relieving Temperature	R	600.00
Back Pressure	psig	10.00
Liquid Saturation Pressure (Ps) at Relieving Temp	psia	107.60
Liquid Mass Density @ Ps	lb/ft3	31.92
Mass Density @ 90% of Ps	lb/ft3	16.40
Kd	----	0.65
Kb	----	1.00
Kc	----	1.00
Kv	----	1.00

Calculation Results		
Relieving Pressure (Po)	psia	300.70
Back Pressure (Pb)	psia	24.70
ω_s		8.51
η_{st}		0.945
Subcooling Region		High
$\eta_s = P_s/P_o$		0.358
η_c		0.358
Critical Pressure (Pc)	psia	107.60
Flow Regime	----	Critical
used η as per type of flow regime		0.36
used P as per type of flow regime	psia	107.60
Mass Flux	lb/s ft2	7560.5
Required Area for PRV	in2	0.21

General Notes	