



Toase-e Park Sanati Gohar Ofogh
Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN
ENGINEERING OF STYRENE PARK OFFSITE**



Document Title: Safety / Relief Valve Data Sheet

Document No.: EI027-HSE-VD – IN– DSH–007- R1

Rev. R1

Page 1 of 5

STYRENE PARK OFFSITE

Document Title:
Safety / Relief Valve Data Sheet

Rev.	Issued Date	DESCRIPTION	PREPARED	CHECKED	APPROVED
R1	18-07-2025	FI	F.sh	M.O	A.M
R0	21-07-2024	IFA	F.sh	M.O	A.M



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Page 2 of 5

REVISION RECORD SHEET

Page Page	Revisions							Page	Revisions						
	R0	R1	R2	R3	R4	R5	R6		R0	R1	R2	R3	R4	R5	R6
1	X	X						41							
2	X	X						42							
3	X	X						43							
4	X	X						44							
5	X	X						45							
6								46							
7								47							
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Page 3 of 5

GENERAL	1	Tag Number	PSV-RU0001A-04, PSV-RU0001B-04		
	2	Service	EVAPORATOR		
	3	Line No.	Equipment No.	3"-PR-RU0001-ML3R1-C	RU0001(A/B)-E-02
	4	P&ID	Vessel Dimension mm	EI027-HSE-VD-PR-PID-002 (5/7)	
	5	Design	Safety-Relief		
	6	Type : Conventional, Bellow, Pilot	Conventional		
	7	Bonnet Type	Nozzle (Full, Semi)	Closed	Full
	8	Pipe Rating Inlet	Pipe Rating Outlet	300#	150#
	9	Fluid State	Corrosive	VAPOR	PROPANE
PROCESS CONDITIONS	10	Required Capacity	3197 kg/h		
	11	Molecular Weight	Sp. Gravity Liq /	44.1	0.437
	12	Pressure Nor / Max	Set Pressure	4.7 bara	22 barg
	13	Temperature Nor /	Relieving	-0.07	70.1°C
	14	Back Pressure	Superimposed+built	0	
	15		built up back	0	
	16		Total	0	
	17	% Allowable Overpressure	21%		
	18	% Blow Down	7.5		
	19	Compressibility Factor	0.8		
	20	Latent Heat of Vaporization	211 kJ/kg		
	21	Ratio of Specific Heats @ Relief	1.11		
	22	Relief Density	Relief Viscosity	53.3 kg/m ³	0.0078 cP
	23	Reactive Force	Noise Level	VTA	VTA
	24	Barometric Pressure	1.0132		
	25	Design Pressure Max	22		
	26	Design Temperature Min / Max	-45	120	
BASIS AND SELECTION	27	Design Code	Vessel Design Code	API RP 526	ASME SEC. VIII Div 1. without U
	28	Manufacturer Code	API 520		
	29	Sizing Basis	Fire Wetted		
	30	Sizing Case	Fire Wetted		
	31	Calculated Area	0.184 in ² (VTA)		
	32	Selected Area	0.196 in ² (VTA)		
	33	Orifice Designation	E (VTA)		
	34	Rated Capacity	3396 kg/h (VTA)		
	35	Seat Leakage	Cold Diff. Test	As per API RP 527	22
	36				
CONNECTI ONS	37	Size: Inlet	Outlet	1" (VTA)	2" (VTA)
	38	Rating & Facing:	Outlet	300#	150#
MATERIALS	39	Body and Bonnet	A352 LCB		
	40	Nozzle / Disc	A351 CF3M ST. / A479 316L ST.		
	41	Blowdown Ring / Locking Screw	SS 316L		
	42	Guide	A351 CF3M		
	43	Spring	CHROME ALLOY STEEL		
	44	Bellows	SS 316L		
	45	Body Stud Bolts / Nut	A193 B7 / A194 Gr.2H		
46	NACE MR-01-75 / ISO 15156	NA			
OPTIONS	47	Cap: Screwed or Bolted	Bolted		
	48	Lever: Plain or Packed	Not Required		
	49	Test Gag	Yes		
	50	Color	Cycle Deltaberg-1 + RAL 7038		
PURCHASE	51	Manufacturer			
	52	Model			

Notes:

1) DOCUMENTATIONS:



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Rev. R1

Page 4 of 5

GENERAL	1	Tag Number	PSV-RU0001A-05,PSV-RU0001B-05		
	2	Service	Receiver		
	3	Line No.	Equipment No.	2"-PR-RU0001(A/B)10-ML3R1-N	
	4	P&ID	Vessel Dimension mm	EI027-HSE-VD-PR-PID-002 (5/7)	
	5	Design	Safety-Relief		
	6	Type : Conventional, Bellow, Pilot	Conventional		
	7	Bonnet Type	Nozzle (Full, Semi)	Closed	Full
	8	Pipe Rating Inlet	Pipe Rating Outlet	300#	150#
PROCESS CONDITIONS	9	Fluid State	Corrosive	VAPOR	PROPANE
	10	Required Capacity	3479 kg/h		
	11	Molecular Weight	Sp. Gravity Liq /	44.1	0.437
	12	Pressure Nor / Max	Set Pressure	19.7 bara	22 barg
	13	Temperature Nor /	Relieving	56.32	70.1°C
	14	Back Pressure	Superimposed+built	0	
	15		built up back	0	
	16		Total	0	
	17	% Allowable Overpressure	21%		
	18	% Blow Down	7.5		
	19	Compressibility Factor	0.8		
	20	Latent Heat of Vaporization	211 kJ/kg		
	21	Ratio of Specific Heats @ Relief	1.11		
	22	Relief Density	Relief Viscosity	53.3 kg/m3	0.0078 cP
	23	Reactive Force	Noise Level	VTA	VTA
	24	Barometric Pressure	1.0132		
25	Design Pressure Max	22			
26	Design Temperature Min / Max	-45	120		
BASIS AND SELECTION	27	Design Code	Vessel Design Code	API RP 526	ASME SEC. VIII Div 1. without U
	28	Manufacturer Code	API 520		
	29	Sizing Basis	Fire Wetted		
	30	Sizing Case	Fire Wetted		
	31	Calculated Area	0.201 in2 (VTA)		
	32	Selected Area	0.307 in2 (VTA)		
	33	Orifice Designation	F (VTA)		
	34	Rated Capacity	5320 kg/h (VTA)		
	35	Seat Leakage	Cold Diff. Test	As per API RP 527	22
	36				
CONNECT IONS	37	Size: Inlet	Outlet	1.5" (VTA)	2" (VTA)
	38	Rating & Facing:	Outlet	300#	150#
MATERIALS	39	Body and Bonnet	A352 LCB		
	40	Nozzle / Disc	A351 CF3M ST. / A479 316L ST.		
	41	Blowdown Ring / Locking Screw	SS 316L		
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OPTIONS	47	Cap: Screwed or Bolted	Bolted		
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	49	Test Gag	Yes		
	50	Color	Cycle Deltaberg-1 + RAL 7038		
PURCHASE	51	Manufacturer			
	52	Model			

Notes:

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	Document Title: Safety / Relief Valve Data Sheet				
	Document No.: EI027-HSE-VD – IN– DSH–007- R1		Rev. R1	Page 5 of 5	

GEAAWP ValveCalc (8.0.15.9416)



Notes

PSV-RU0001AB-01

System Data

System Type	Safety / Overflow Valves				
Line / Component Type	Supply Line: Protection against external heat sources (overflow design)				
Refrigerant	R290		Isentropic Exponent	1.136	
Enthalpy of Vapour	630.2	kJ/kg	Enthalpy of Liquid	397.2	kJ/kg
Density P0	61.76	kg/m ³	Density Section	61.76	kg/m ³
Required Mass Flow	4339.0	kg/h	Required Volume Flow	70.3	m ³ /h

Valve Sizing According to:	DIN EN 13136:2020				
Density of Heat Flow Rate	10.00	kW/m ²	Insulation Thickness	0.000	m

Pressures

Set Pressure Pset	22.00	bar (g)	Back Pressure Pb	6.150	bar (a)
Pressure Fully Open Valve	25.21	bar (a)	Pressure Diff. dp	22.01	bar
			Back Pressure P2	1.00	bar (a)

Component

Properties

Type	Safety Overflow Valve	DN-inlet	DN40
Articlecode	SVUA P FL DN40/40 PN40 22-23,9	DN-outlet	DN40
Articlenr.	45822D12A5A1S000		
Component Characteristics	Angle, Set Pressure [bar (g)]: 22.00 bar (g), Connection Type: Flanged End, Back pressure independent		
Comments	Refrigerant: R290 PSet: 22.00		

Calculation Results

ṁ-Valve	6425.6	kg/h
ṁ-Standard	5140.5	kg/h

Results