

## Specification & Calculation Sheet



DOCUMENT NO.	180760-R2-P-054-2-S-0002
PROJECT NAME	Yeosu No. 2 Complex Project
ITEM NO.	Pressure Safety Valve
COMPANY NAME	LG Chem, Ltd.
SITE LOCATION	Yeosu, Korea
CONTRACTOR NAME	GS E&C
PROJECT NO.	180760
PURCHASE ORDER NO.	180760-R2-GS-PO-P-054-2
VENDOR NAME	Jokwang I.L.I

Action Code	Description
□ 1	Approved without comment,  Vendor to submit "FINAL"
□ 2	Approved with comment,  Vendor to amend and submit "FOR FINAL"
□ 3	Vendor to amend and re-submit "FOR APPROVAL"
□ 4	Not Reviewed/Considered unacceptable Quality, Vendor to re-submit "FOR APPROVAL"

2	23.FEB.21	FINAL	S.W.PARK	M.J.LEE	J.H.LEEM
1	22.JAN.21	FOR FINAL	S.W.PARK	M.J.LEE	J.H.LEEM
0	16.JUL.20	FOR FINAL	S.W.PARK	J.G.YOON	J.H.LEEM
Α	03 MAR. 20	FOR APPROVAL	S.W.PARK	J.G.YOON	S.C.KIM
REV.	DATE	DESCRIPTION	PREP'D	CHK'D	APP'D



				Pressure Sa	fety & Relief Val	lve	Specification and Calculation She	et	
	R		-	Sheet No.	1 of 11		Rev . No	1	
	T. 17	OKWANG I.L.I		Project Name		Yeo	osu No.2 Complex Project(R2) 2nd PO	·	
	Since 1968	OKWAITO I.L.I		Project No.					
				Date	2021-01-22			S.W.PARK	
			<u> </u>	Checked	M.J.LEE			J.H.LEEM	
	P&ID No.		1		H	153	0-R2-PID-1011		
긡	Tag No.		2				PSV-1029/1030		
GENERAL	Service Line		3	E-1 08A/B 2ND ST/			XCHANGER #2-1 TUBE SIDE E-1 09A/ XCHANGER #2-2 TUBE SIDE	B 2ND STAGE	
	Model No.		4	JSV-FF1	00		Calculation		
	Quantity		5	2					
	Nozzle Type		6	Full Noz		Calculation of Area			
m.	Design Type		7	Convention	onal				
TYPE	Bonnet Type	2	8	Close					
	Lever Type	**		None		A1	$= 13160*W1*(\sqrt{ZT/M})/(C*Kd*(P*1.1+1)$	01.325)*Kb*Kc)	
	Cap Type		10	Screwe	d				
<del>_</del>	Size. Inlet /	Outlet	11	3"X4"			= 13160*19856*(√0.952*465.4/26.10)/	(331.04*0.831*	
CONN.	Inlet. Rating	/ Facing	12	ASME CL.6	00 RF (4	484	4*1.1+101.325)*1*1)		
0	Outlet. Ratir	ng / Facing	13	ASME CL.1	50 RF				
	Body (Base)		14	SA217 (	<u></u>		= <u>720.775029</u> mm²		
	Bonnet		15	SA217 (	25				
S	Seat		16	316 SS-	st.				
MATERIALS	Disc		17	316 SS-	st.		Calculation of Capacity		
ATER	Guide		18	316 SS	;		, ,		
Ž	Gasket (Bon	net)	19	Graphit	e				
	Spring	· · · · · · · · · · · · · · · · · · ·		Inconel X-750		W	= A*C*Kd*(P*1.1+101.325)*Kb*Kc/(131	60*√(ZT/M))	
	Bellows		20	None		-			
	Approved by			KGS UV STAMP			= 834.19*331.04*0.831*(4844*1.1+101	225\*1*1/	
	Comply with	,	22	No			60*√(0.952*465.4/26.10))	.323) 1 1/	
	EN 10204	INACL	_	24 No			,,		
BASIS	Code		25	API RP 5	20		= <b>22980</b> kg/h		
BA	Fire		26	No.	20	= <u>22960</u> kg/II			
	Sizing Basis		27	Thermal Exp	ansion				
	Rupture Disl	,	28	No		N	Valve Capacity	22980 kg/h	
	· ·		_			_	, ,		
	Fluid / State		29	HC / GA		V1	Required Capacity	19856 kg/h	
		/ Specific Gravity	30	26.10		P	Set Pressure	4844 KPag	
	Compressibi	·	31	0.952		11	Calculated Area	720.775029 mm²	
	Ratio of Spe	ecific Heat	32	1.140		Α	Selected Area	834.19 mm²	
Z	Viscosity		33	0.017 c		(d	Coefficient of Discharge	0.831	
Ĕ	_	Relieving Temp.	34	192.36 / 19		<u>_</u>	Coefficient base on Ratio of Specific Heat	331.04	
OND		/ Design Max. Temp.	35			T	Kelvin Temperature	465.4 K	
SERVICE CONDITION		Set Pressure	36	3.677 / 4.844		M	Molecular Weight	26.10	
Z	Design Press	sure / C.D.T.P	37	4.844 / 4.81		Z	Compressibility Factor	0.952	
SER		Superimposed - Constant	38			(b	Correction Factor Due to Back Pressure	1	
-	Back	Superimposed - Variable	39			⟨c	Correction Factor for a rupture disk	1	
	Pressure	Built-up	40	0.08	1 MPag		Remarks		
		Total	41	0.1	1 MPag		Remarks		
	Allowable O	verpressure	42		10 %	*D	am arte		
	Closing Pres	sure / Blowdown(%)	43	Min. 4.50492 MF	2an / /%		e <u>mark</u> vice Requirement : NACE MR0103		
z	Required Ca	pacity	44	1985			nting: P-5		
SIZING & SELECTION	Valve Actual	Capacity	45	2298	30 kg/h	- C	perating Pressure : 37.5 kg/m²g		
LEC	Calculated Orifice Area Selected Orifice Area		46	720.77	JOL J IIIII		etting Pressure : 49.4 kg/m²g		
S SE			47	83	4 19       1		esign Pressure : 49.4 kg/m²g		
8	Orifice Dia.(mm)		48	J(32.6)		- Constant Back Pressure : 0.3 kg/m²g - Variable Back Pressure : kg/m²g			
NIN				-			uilt-up Back Pressure : 0.83 kg/m²g		
S				-			equired Capacity : 19856 kg/hr		
	Paint System & Color		49	See Rem			alve Capacity : 22980 kg/hr		
ETC	Test Gag	. 4 000	50	Yes	un N				
ш	Bug screen		51	No					
	pug scieen		ار	INO					

				Pressure Sa	fety & Relief Va	alve	Specification and Calculation She	et	
	R			Sheet No.	2 of 11		Rev . No	1	
	Tek J	OKWANG I.L.I		Project Name		Yeo	osu No.2 Complex Project(R2) 2nd PO		
	Since 1968			Project No.	2024 04 22			TAM DA DIK	
				Date Checked	2021-01-22 M.J.LEE			J.H.LEEM	
	P&ID No.		1	Checked		H53		J.I I.LLLIVI	
بِ	Tag No.		2				PSV-1311/1312		
GENERAL	Service Line		3				JBE OIL COOLER) PLATE SIDE		
뜅	Model No.		4	JSV-FF10		. (2.	,		
	Quantity		5	2			Calculation		
	Nozzle Type		6	Full Nozz	zle		Calculation of Area		
	Design Type		7	Conventio	-				
TYPE	Bonnet Type		8	Close					
-	Lever Type	ever Type		None		Δ1	= 11.78*W1*(√G/(P1-Pb))/(Kd*Kb*Kc*k	(v)	
	Cap Type		10	Screwed	d	Α1	= 11.70 W1 (VG/(F1-FB))/(Kd KB KC F	(V)	
	Size. Inlet /	Outlet	11	3/4"X1'					
CONN.	Inlet. Rating		12	ASME CL.15			= 11.78*0.2*\/(0.981/(1131.9-9))/(0.615	*1*1*0.895)	
ŏ	Outlet. Ratin	·	13	ASME CL.15					
	Body (Base)		14	SA216 W	CB		$= 0.126515 \text{ mm}^2$		
	Bonnet		15	SA216 W					
S	Seat		16	316 SS-s					
SIAL	Disc			316 SS-s			Calculation of Capacity		
MATERIALS	Guide	iide		316 SS	;		. ,		
Ž	Gasket (Bon	net)	19	PTFE					
	Spring	Spring		316 SS			$W = A*Kd*Kb*Kc*Kv/(11.78*\sqrt{(G/(P1-Pb)))}$		
	Bellows		21	None					
	Approved by		22	UV STAMP			= 132.9*0.615*1*1*0.895/(11.78*√(0.98	1/(1131.9-9)))	
	Comply with	NACE	23	No					
100	EN 10204		24	No			= 210.10 <b>l</b> /min		
BASIS	Code		25	API RP 520-Cer	tification		= <b>12.6</b> m3/h		
	Fire		26	No					
	Sizing Basis		27	Thermal Expansion					
	Rupture Disl	<	28	No		W	Valve Capacity	210.10 l/min	
	Fluid / State		29	CW / LIQL	JID \	W1	Required Capacity	0.2 <b>l</b> /min	
	Mol. Weight	/ Specific Gravity	30	0.981		Р	Set Pressure	1029 KPag	
	Compressibi		31	-		A1	Calculated Area	0.126515 mm²	
	Ratio of Spe	cific Heat	32	-		Α	Selected Area	132.9 mm²	
Z	Viscosity		33	0.437 cl		Kd	Coefficient of Discharge	0.615	
III		Relieving Temp.	34			G	Specific Gravity	0.981	
ONC		/ Design Max. Temp.	35			Pb	Back Pressure	9 KPag	
) H		Set Pressure	36	0.539 / 1.029		Kb	Correction Factor Due to Back Pressure	1	
SERVICE CONDITION	Design Press	sure / C.D.T.P	37	1.029 / 1.029	<del></del>	Kc	Correction Factor for a rupture disk	1	
SER		Superimposed - Constant	38			Kv	Correction Factor due to Viscosity	0.895	
	Back	Superimposed - Variable	39			P1	Set Pressure plus Overpressure	1131.9 KPag	
	Pressure	Built-up	40		9 MPag		Remarks		
	Allerral	Total	41	0.009	MPag				
	Allowable O	verpressure sure / Blowdown(%)	42	Min 0 97464 NAD / 41	10 %	*Re	emark_		
			43	Min. 0.87464 MPag / 15			pperating Pressure : 5.5 kg/m²g		
O	Required Ca	· · ·	44 45		2 m3/h		etting Pressure : 10.5 kg/m²g		
ECT	Valve Actual		46		6 m3/h		Design Pressure : 10.5 kg/m²g wilt-up Back Pressure : 0.1 kg/m²g		
SEL	Calculated Orifice Area		46		32.9 mm²		Required Capacity : 12 kg/h		
SIZING & SELECTION	Selected Orifice Area Orifice Dia.(mm)		48	D1(13)		- V	alve Capacity : 7357.5 kg/h		
ZINC	Office Dia.(I	iiiiij	40						
SIZ				<u>-</u>					
	Daint Cont	2 Color	40	- Con Roma	orle				
ETC	Paint System	1 & C0101	49 50	See Rema	dI K				
ш	Test Gag			Yes					
	Bug screen		51	No					

Ref. No : SLO200334-30-642279 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

				Pressure Sa	afety & Relief Va	lve	Specification and Calculation She	et	
	R			Sheet No.	3 of 11		Rev . No	1	
	TAK J	OKWANG I.L.I	Project Name		Yec	osu No.2 Complex Project(R2) 2nd PO			
	Since 1968			Project No.					
				Date Checked	2021-01-22 M.J.LEE		<del></del>	S.W.PARK J.H.LEEM	
	P&ID No.		1	Спескей		ПЕЭ	Approved 0-R2-PID-3026	J.M.LEEIVI	
ب	Tag No.		2				-PSV-3261A/B		
GENERAL	Service Line		3		F-31 5 (R		tene Product Cooler) SS		
S S	Model No.		4	JSV-FF1		JCTIZ	eric Froduct Cooler, 55		
	Quantity		5	2			Calculation		
	Nozzle Type		6	Full Noz	zle		Calculation of Area		
	Design Type		7	Convention			carcaration of Airca		
TYPE	Bonnet Type		8	Close					
F	Lever Type		9	None		A1	= 13160*W1*(√ZT/M)/(C*Kd*(P*1.21+	101.325)	
	Cap Type		10	Screwe		*Kb		,	
	Size. Inlet / (	Outlet	11	1"X2"					
CONN.	Inlet. Rating		12	ASME CL.1	50 RF		= 13160*2045*(\sqrt{0.785*476.1/78.12})/(3	333.86*0.831*	
8	Outlet. Ratin	, ,	13	ASME CL.1	(	(117	<sup>7</sup> 6*1.21+101.325)*1*1)		
	Body (Base)	9,	14	SA216 W			- 120 102069 mm²		
	Bonnet		15	SA216 W			= <u>139.193968</u> mm²		
10	Seat			316 SS-					
MATERIALS	Disc			316 SS-			Calculation of Capacity		
YER.	Guide		18	316 SS					
Ž	Gasket (Boni	net)	19	PTFE					
	Spring		20	316 SS			$W = A*C*Kd*(P*1.21+101.325)*Kb*Kc/(13160*\sqrt{(ZT/M)})$		
	Bellows		21	None			1		
	Approved by		22	KGS UV STAMP			= 188.39*333.86*0.831*(1176*1.21+10	)1.325)*1*1/	
	Comply with		23	No	(		60*√(0.785*476.1/78.12))		
	EN 10204		24	No					
BASIS	Code		25	API RP 5	520		= <b>2768</b> kg/h		
-	Fire		26	Yes			<u> </u>		
	Sizing Basis		27	Fire Case					
	Rupture Disk	<	28	No	,	W	Valve Capacity	2768 kg/h	
	Fluid / State		29	Hydrocarbon(H	IC) / GAS V	W1	Required Capacity	2045 kg/h	
	Mol. Weight	/ Specific Gravity	30	78.12		Р	Set Pressure	1176 KPag	
	Compressibi	lity Factor	31	0.785	A	A1	Calculated Area	139.193968 mm²	
	Ratio of Spe	cific Heat	32	1.167		Α	Selected Area	188.39 mm²	
z	Viscosity		33	0.018 c	P k	Kd	Coefficient of Discharge	0.831	
읃	Operating /	Relieving Temp.	34	108 / 20	03.1 ℃	C	Coefficient base on Ratio of Specific Heat	333.86	
₫	Design Min.	/ Design Max. Temp.	35		150 ℃	Τ	Kelvin Temperature	476.1 K	
SERVICE CONDITION	Operating /	Set Pressure	36	0.715 / 1.17	6 MPag	М	Molecular Weight	78.12	
/ICE	Design Press	sure / C.D.T.P	37	1.176 / 1.1584	7 MPag	Z	Compressibility Factor	0.785	
SER		Superimposed - Constant	38	0.02	9 MPag	Kb	Correction Factor Due to Back Pressure	1	
	Back	Superimposed - Variable	39			Kc	Correction Factor for a rupture disk	1	
	Pressure	Built-up	40		9 MPag		Remarks		
		Total	41	0.05	8 MPag		Kemana		
	Allowable O	<u>'</u>	42		21 %	*P=	aint Color(*)		
		sure / Blowdown(%)	43	Min. 1.09368 MF			inting: P-5 (RAL 9006 Silver)		
N	Required Ca		44		45 kg/h				
SIZING & SELECTION	Valve Actual	<u> </u>	45		68 kg/h		e <u>mark</u> Operating Pressure : 7.3 kg/m²g		
SELE	Calculated Orifice Area Selected Orifice Area		46		3968 mm²		etting Pressure : 7.3 kg/m g		
જ			47		38.39 mm²		Design Pressure : 12.0 kg/m²g		
N N	Orifice Dia.(r	nm)	48	E1(15.5	0)	- Constant Back Pressure : 0.3 kg/m²g			
SIZ			$\vdash$	-		- B	uilt-up Back Pressure : 0.3 kg/m²g		
			Щ	-					
ETC	Paint System	n & Color	49	See Rem	ark				
Ξ	Test Gag		50	Yes					
	Bug screen		51	No					

Ref. No : SLO200334-40-642284 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

				Pressure Sa	fety & Relief Va	alve	Specification and Calculation She	eet	
	R			Sheet No.	4 of 11		Rev . No	1	
	TAK J	OKWANG I.L.I		Project Name		Ye	osu No.2 Complex Project(R2) 2nd PO		
	Since 1968			Project No.			- 1		
				Date Checked	2021-01-22 M.J.LEE		<del></del>	S.W.PARK J.H.LEEM	
	P&ID No.		<del></del>			ПЕЗ	Approved 80-R2-PID-3037	J.H.LEEIVI	
ب	Tag No.		2				R2-PSV-3371		
GENERAL	Service Line		3		HP Cold drain to		-302-D6 (Cold Drains Vaporizer)		
E N	Model No.		4	JSV-FF1(		) VV-	-302-D0 (Cold Drains Vaporizer)		
	Quantity		5	1	50		Calculation		
	Nozzle Type		6	Full Nozz	710		Calculation of Area		
	Design Type		7	Convention			Calculation of Area		
TYPE	Bonnet Type		8	Close	niai				
7	- ,'	:	9	None		۸1	= 11.79*\\\/1*\\/\C/\\/\D1.Db\\\/\/\d*\/b*\/c*	:Kv)	
	, ,	ever Type		Screwe	d	Αī	= $11.78*W1*(\sqrt{G/(P1-Pb)})/(Kd*Kb*Kc*)$	NV)	
	Cap Type Size. Inlet / 0	Outlet	10	3/4"X1			11 7010 0000001 (/0.140 //5505.0.0)	,	
CONN.	,		11	,			= 11.78*0.9333333*√(0.449/(6526.3-9)) 15*1*1*0.969)	/	
00	Inlet. Rating		12	ASME CL.60		(0.0	13 1 1 0.909)		
	Outlet. Ratin	y / racing	13	ASME CL.15			0.153134		
	Body (Base)		14 15	SA351 CF			$= 0.153134 \text{ mm}^2$		
	Bonnet			SA351 CF					
ALS	Seat		16	316 SS-s					
MATERIALS	Disc		17	316 SS-s			Calculation of Capacity		
MAT	Guide		18	316 SS					
	Gasket (Bonnet) Spring		19	PcTFE			$W = A*Kd*Kb*Kc*Kv/(11.78*\sqrt{(G/(P1-Pb)))}$		
			20	316 SS					
	Bellows		21	None			122.0+0.645+1+1+0.060.//11.70+.//0.4	40 ((6526.2.0)))	
	Approved by		22	KGS UV ST	AMP	= 132.9*0.615*1*1*0.969/(11.78*\(0.449/(652		49/(6526.3-9)))	
	Comply with	NACE	23	No					
BASIS	EN 10204		24	No			= 810.00 l/min = <b>48.6</b> m3/h		
BAS	Code		25	API RP 520-Certification			= 48.6 1115/11		
	Fire		26	No Thermal Expansion					
	Sizing Basis		27				lu	1 010 00 1/ :	
	Rupture Disk		28	No		W	Valve Capacity	810.00 l/min	
	Fluid / State		29	Hydrocarbon(HC		W1	Required Capacity	0.933333 l/min	
		/ Specific Gravity	30	0.449	-	P	Set Pressure	5933 KPag	
	Compressibi		31	-	-	A1	Calculated Area	0.153134 mm²	
	Ratio of Spe	cific Heat	32	- 0.100		A	Selected Area	132.9 mm²	
8	Viscosity	Delle de e Terre	33	0.120 c		Kd	Coefficient of Discharge	0.615	
SERVICE CONDITION		Relieving Temp.	34			G	Specific Gravity	0.449	
ONE		/ Design Max. Temp.	35			Pb	Back Pressure	9 KPag	
E C		Set Pressure	36	4.873 / 5.933	<del>_</del>	Kb	Correction Factor Due to Back Pressure	1	
SVIC.	Design Press	sure / C.D.T.P	37	5.933 / 5.933		Kc	Correction Factor for a rupture disk	1	
SER	DI	Superimposed - Constant	38			Kv D1	Correction Factor due to Viscosity	0.969	
	Back	Superimposed - Variable	39		- 3	P1	Set Pressure plus Overpressure	6526.3 KPag	
	Pressure	Built-up	40		MPag MPag		Remarks		
	Allowable O	Total	41	0.009	10 %				
		verpressure sure / Blowdown(%)	43	Min. 5.04305 MPa		*R	<u>emark</u>		
			-			Se	rvice Requirement : Cryogenic Service		
O	Required Ca		44 45		6 m3/h	_	Operating Processes : 40.7 leg/m²-		
SIZING & SELECTION	Valve Actual	· · ·	45		6 m3/h		Operating Pressure : 49.7 kg/m²g Setting Pressure : 60.5 kg/m²g		
SELI	Calculated Orifice Area		-		3134 mm²		Design Pressure : 60.5 kg/m²g		
8	Selected Orifice Area		47		32.9 mm²	- B	Built-up Back Pressure : 0.1 kg/m²g		
NE S	Orifice Dia.(mm)		48	D1(13)			Required Capacity : 24.695 kg/h		
SIZ			$\vdash$	-		- \	/alve Capacity : 22539.8 kg/h		
			Щ	-					
ETC	Paint System	n & Color	49	None					
=	Test Gag		50	Yes					
	Bug screen		51	No					

Ref. No : SLO200334-50-642287 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

Size No.   Service No.   Ser					Pressure Sa	afety & Relief V	'alve	Specification and Calculation Sh	eet
Policy		W R			Sheet No.	5 of 11		Rev . No	1
Policy		Tek J	JOKWANG I.L.I Project Name				Ye	osu No.2 Complex Project(R2) 2nd PO	
PRID No		Since 1968							
Tag No.   1							2		
Table		DOID No		1	Спескеа	MJ.LEE	LIES	<del></del>	J.H.LEEM
Calculation	_			<u> </u>					
Calculation	₽¥			_		ID Cold drain to			
Calculation	EN I				ICV FF1		O VV-	302-D6 (Cold Drains Vaporizer)	
Nozzie Type	Ŭ			_		00		Calculation	
Design Type		,		_		710		Calculation of Area	
Bonnet Type								Calculation of Area	
The first Part   10   Screwed   11   3/4"X1"   11/18"033333"\(0.049/(1617-9))/ (0.615*1*1*0.969)   11/18"   1	푎			<u> </u>					
The composition of the composi	7		•	_			۸1	- 11 79*\\\\1*\\\\C\\\C\\\D1 Dh\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	*V.A
Size. Intel / Outlet   11   3/4"X1"   11   3/4"X1"   11   3/4"X1"   12   ASME CL150 RP   (0.515*11*10.969)   (0.515*11*10.9				+ -			Λı	= 11.70 W1 (VG/(F1-FB))/(Rd RB RC	KV)
Inlet. Rating / Facing			Outlet	_				11 70+0 022222+ //0 440 //1 (17 0)) /	
Bady (Sase)	Ž			-	, , ,				
Body (8ase)   14   SA351 CF8M   Seat	8			_			(0.0	.5 6.565,	
Bonnet			ig / Tucing					- 0.308293 mm²	
Seat				_				<u></u>	
Disc				_					
March   19	IALS			_				Calculation of Capacity	
March   19	TER			_				carcaration or capacity	
Spring   20   316 SS   Bellows   21   None	M		net)	<del>-</del>					
Bellows			- 4	20			W	= A*Kd*Kb*Kc*Kv/(11.78*√(G/(P1-Pb)	))
Comply with NACE   23				21			1		
Comply with NACE		Approved by	<b>y</b>	22	KGS UV STAMP			= 132.9*0.615*1*1*0.969/(11.78*\/(0.4	149/(1617-9)))
Fix   10204				23	No				
Fire				24	No			= 402.30 l/min	
Fire	ASIS	Code		25	API RP 520-Ce	rtification	= <b>24.1</b> m3/h		
Rupture Disk   28	-	Fire		26	No				
Fluid / State		Sizing Basis		27	Thermal Exp	ansion			
Mol. Weight / Specific Gravity   30   0.449   P   Set Pressure   1470 KPag		Rupture Disl	(	28	No		W	Valve Capacity	402.30 ℓ/min
Compressibility Factor   31   -		Fluid / State		29	Hydrocarbon(HC	C) / LIQUID	W1	Required Capacity	0.933333 {/min
Ratio of Specific Heat   32		Mol. Weight	/ Specific Gravity	30	0.449		Р	Set Pressure	1470 KPag
Viscosity		Compressibi	lity Factor	31	-		A1	Calculated Area	0.308293 mm²
Operating / Relieving Temp.   34		Ratio of Spe	cific Heat	32	-		Α	Selected Area	132.9 mm²
Back   Superimposed - Variable   39	z	Viscosity		33	0.12 c	Р	Kd	Coefficient of Discharge	0.615
Back   Superimposed - Variable   39	10	Operating /	Relieving Temp.	34	-148	/ 60 ℃	G	Specific Gravity	0.449
Back   Superimposed - Variable   39	Ξ	Design Min.	/ Design Max. Temp.	35	-196	5/66 °C	Pb	Back Pressure	9 KPag
Back   Superimposed - Variable   39	8			_	0.588 / 1.4	7 MPag	Kb	Correction Factor Due to Back Pressure	1
Back   Superimposed - Variable   39	/ICE	Design Press	,	_	1.47 / 1.4	7 MPag	Kc	Correction Factor for a rupture disk	1
Back   Superimposed - Variable   39	SER			_				· · · · · · · · · · · · · · · · · · ·	+
Total   41   0.009 MPag   Remarks				_			P1	Set Pressure plus Overpressure	1617 KPag
Allowable Overpressure		Pressure	•	_				Remarks	
Required Capacity				-	0.00				
Required Capacity  Valve Actual Capacity  44  0.056 m3/h  Valve Actual Capacity  45  Calculated Orifice Area  Selected Orifice Area  Orifice Dia.(mm)  Paint System & Color  Test Gag  Addin. 1.2495 MPag / 15%  Min. 1.2495 MPag / 15%  Service Requirement : Cryogenic Service  Operating Pressure : 6 kg/m²g  Setting Pressure : 15 kg/m²g  Design Pressure : 15 kg/m²g  Constant Back Pressure : kg/m²g  Variable Back Pressure : kg/m²g  Built-up Back Pressure : 0.1 kg/m²g  Required Capacity : 24.695 kg/h  Valve Capacity : 9833.1 kg/h			· · · · · · · · · · · · · · · · · · ·	_			*R	emark	
Valve Actual Capacity   45   24.1 m3/h   Calculated Orifice Area   46   0.308293 mm²   Design Pressure : 15 kg/m²g   Constant Back Pressure : kg/m²g   Variable Back Pressure : kg/m²g   Variable Back Pressure : kg/m²g   Variable Back Pressure : 0.1 kg/m²g   Built-up Back Pressure : 0.1 kg/m²g   Required Capacity : 24.695 kg/h   Valve Capacity : 9833.1 kg/h   Valve Capacit							_		2
Paint System & Color 49 None Test Gag 50 Yes - Required Capacity : 24.093 kg/li - Valve Capacity : 9833.1 kg/h	Z	-		-			_	Out and the se Dune	
Paint System & Color 49 None Test Gag 50 Yes - Required Capacity : 24.093 kg/li - Valve Capacity : 9833.1 kg/h	OLE		Valve Actual Capacity						
Paint System & Color 49 None Test Gag 50 Yes - Required Capacity : 24.093 kg/li - Valve Capacity : 9833.1 kg/h	ELEC	Calculated Orifice Area		_					
Paint System & Color 49 None Test Gag 50 Yes - Required Capacity : 24.093 kg/li - Valve Capacity : 9833.1 kg/h	8 8			-	1	32.9 mm²	- (	Constant Back Pressure : kg/m²g	
Paint System & Color 49 None Test Gag 50 Yes - Required Capacity : 24.093 kg/li - Valve Capacity : 9833.1 kg/h	S	Orifice Dia.(mm)		48	D1(13	)			
- Valve Capacity : 9833.1 kg/h Paint System & Color 49 None Test Gag 50 Yes	SIZI								
Paint System & Color 49 None Test Gag 50 Yes									
		Paint System	n & Color	49	None			-	
Bug screen 51 No	ETC	Test Gag		50	Yes				
		Bug screen		51	No				

Ref. No : SLO200334-60-642288 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

				Pressure Sa	fety & Relief Val	lve	Specification and Calculation Shee	t	
	R			Sheet No.	6 of 11		Rev . No	1	
	TAK J	OKWANG I.L.I		Project Name		Yec	osu No.2 Complex Project(R2) 2nd PO		
	Since 1968			Project No.					
			<b>-</b>	Date Checked	2021-01-22 M.J.LEE			.W.PARK .H.LEEM	
	P&ID No.		1	Checked		152		.H.LEEIVI	
ب	Tag No.		2				-PSV-3373A/B		
GENERAL	Service Line		3				Cold Drains Vaporizer)		
N N	Model No.		4	JSV-FF1		) 0 (	Cold Dianis Vaponzery		
	Quantity		5	2		Calculation			
	Nozzle Type		6	Full Noz	zle		Calculation of Area		
	Design Type		7	Convention		Calculation of Area			
YPE	Bonnet Type		8	Close					
۲	Lever Type	•	9	None		A1	= 13160*W1*(√ZT/M)/(C*Kd*(P*1.21+1	01.325)	
	Cap Type		10	Screwe	*		*Kc)	,	
	Size. Inlet / (	Outlet	11	1"X2"					
CONN.	Inlet. Rating		12	ASME CL.1	50 DE		= 13160*387*(\(\sqrt{0.849*475.7/91.55}\)/(228	3.08*0.831*	
S	Outlet. Ratin	·	13	ASME CL.1	(;	588	(*1.21+101.325)*1*1)		
	Body (Base)	g, <del></del> g	14	SA351 CF			= <b>69.43581</b> mm²		
	Bonnet			SA351 CF			- <u>05.43301</u> IIIII		
	Seat		15 16	316 SS-					
MATERIALS	Disc		17	316 SS-			Calculation of Capacity		
VTER	Guide		18	316 SS			C. Capacity		
Ž	Gasket (Boni	net)	19	PcTFE					
	Spring Bellows		20	316 SS			$W = A*C*Kd*(P*1.21+101.325)*Kb*Kc/(13160*\sqrt{ZT/M})$		
			21	None		, , , , , , , , , , , , , , , , , , , ,			
	Approved by		22	KGS UV STAMP			= 132.9*228.08*0.831*(588*1.21+101.3	25)*1*1/	
	Comply with		23	No	(1	(13160*√(0.849*475.7/91.55))			
	EN 10204		24	No					
BASIS	Code		25	API RP 5	520		= <b>741</b> kg/h		
-	Fire		26	Yes					
	Sizing Basis		27	Fire Case					
	Rupture Disk	(	28	No	V	W	Valve Capacity	741 kg/h	
	Fluid / State		29	Hydrocarbon(H	C) / GAS W	V1	Required Capacity	387 kg/h	
	Mol. Weight	/ Specific Gravity	30	91.55	ī	Р	Set Pressure	588 KPag	
	Compressibi	lity Factor	31	0.849	Α	۸1	Calculated Area	69.43581 mm²	
	Ratio of Spe	cific Heat	32	0.449	Į.	Α	Selected Area	132.9 mm²	
z	Viscosity		33	0.017 c	P K	(d	Coefficient of Discharge	0.831	
SERVICE CONDITION	Operating /	Relieving Temp.	34	40 / 20	02.7 ℃	С	Coefficient base on Ratio of Specific Heat	228.08	
ND	Design Min.	/ Design Max. Temp.	35	-166/	200 ℃	Т	Kelvin Temperature	475.7 K	
8	Operating /	Set Pressure	36	0.101 / 0.588	8 MPag N	М	Molecular Weight	91.55	
/ICE	Design Press	sure / C.D.T.P	37	0.588 / 0.559	9 MPag	Z	Compressibility Factor	0.849	
SER!		Superimposed - Constant	38	0.029	9 MPag K	(b	Correction Factor Due to Back Pressure	1	
•	Back	Superimposed - Variable	39		- MPag K	⟨c	Correction Factor for a rupture disk	1	
	Pressure	Built-up	40		4 MPag		Remarks		
		Total	41	0.053	3 MPag		Neiliaiks		
	Allowable O	<u>'</u>	42		21 %	*D	emark		
		sure / Blowdown(%)	43	Min. 0.54684 MF	ag / 7%	?	SHAR		
Z	Required Ca	· · ·	44				equired Capacity : 387 kg/h		
SIZING & SELECTION	Valve Actual Capacity		45			- V	alve Capacity : 682 kg/h		
ËLE	Calculated Orifice Area		46		3581 mm²				
8	Selected Orifice Area		47		32.9 mm²				
N.	Orifice Dia.(mm)		48	D1(13)					
SIZ				-					
			Щ	-					
O	Paint System	n & Color	49	None					
ETC	Test Gag		50	Yes					
	Bug screen		51	No					

Ref. No : SLO200334-70-642290 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

				Pressure Sa	ıfety & Relief Va	lve	Specification and Calculation Shee	et		
	R			Sheet No.	7 of 11		Rev . No	1		
	Tek J	OKWANG I.L.I	Project Name			Yeosu No.2 Complex Project(R2) 2nd PO				
	Since 1968			Project No.	2024 04 22			TAY DA DIY		
				Date Checked	2021-01-22 M.J.LEE			.W.PARK .H.LEEM		
	P&ID No.		1	CHECKEU		H53		.11.LLLIVI		
ب	Tag No.		2				PSV-3402/3403			
GENERAL	Service Line		3				B-E1 (Oil Cooler) TS			
N N	Model No.		4	JSV-FF1		17.47	B ET (Oil Cooler) 13			
	Quantity		5	2			Calculation			
	Nozzle Type		6	Full Noz	zle		Calculation of Area			
	Design Type		7	Convention	-		carculation of Area			
YPE	Bonnet Type		8	Close						
F	Lever Type	<u> </u>	9	None		۸ 1	_ 11 70*\\/1*/-\/C //D1 Db\\\///d*//b*//c*/	5.0		
	Cap Type		10	Screwe		Αī	$= 11.78*W1*(\sqrt{G/(P1-Pb)})/(Kd*Kb*Kc*k)$	(V)		
	Size. Inlet /	Outlet	11	3/4"X1						
CONN.	Inlet. Rating		12	ASME CL.1			$= 11.78*0.2*\sqrt{(0.986/(1131.9-9))/(0.615)}$	*1*1*0.886)		
S	Outlet. Ratin	·	13	ASME CL.1						
	Body (Base)	.g , . ucg	14	SA216 W			= <u>0.128125</u> mm²			
	Bonnet		15	SA216 W						
	Seat			316 SS-						
MATERIALS	Disc		16 17	316 SS-			Calculation of Capacity			
품	Guide		18	316 SS			Calculation of Capacity			
MA	Gasket (Bon	net)	19	PTFE	,					
	Spring	net)	20	316 SS	:	\٨/	= A*Kd*Kb*Kc*Kv/(11.78*√(G/(P1-Pb)))			
	Bellows		21	None			W = A Rd Rb Rc RV/(11.70 V(G/(111b)))			
	Approved by		22	UV STAMP			= 132.9*0.615*1*1*0.886/(11.78*\(0.98	6/(1131 9-9)))		
			23	No	VIP		= 132.5 0.013 1 1 0.000/(11.70 V(0.30	0/(1131.5 3)))		
	Comply with EN 10204	INACE	24	No No			207 50 1/20:0			
BASIS	Code		25	API RP 520-Cei	rtification		= 207.50 {/min = <b>12.5</b> m3/h			
BA	Fire		26	No No						
	Sizing Basis		27	Thermal Exp	ansion					
	Rupture Disl	,	28	No No		W	Valve Capacity	207.50 <b>l</b> /min		
	Fluid / State		29	CW / LIQI		W1	Required Capacity	0.2 l/min		
		/ Specific Gravity	30	0.986	-	P	Set Pressure	1029 KPag		
	Compressibi	•	31	0.500		<u>'</u> A1	Calculated Area	0.128125 mm²		
	Ratio of Spe		32	_		A	Selected Area	132.9 mm²		
	Viscosity	cinc ricat	33	0.504 c		Kd	Coefficient of Discharge	0.615		
<u>8</u>		Relieving Temp.	34			G	Specific Gravity	0.986		
SERVICE CONDITION		/ Design Max. Temp.	35			Pb	Back Pressure	9 KPag		
Ö		Set Pressure	36	0.49 / 1.029		Kb	Correction Factor Due to Back Pressure	3 Ki ag		
GE C		sure / C.D.T.P	37	1.029 / 1.029		Kc	Correction Factor for a rupture disk	1		
N S	Design Fress	Superimposed - Constant	38			Kv	Correction Factor due to Viscosity	0.886		
S	Back	Superimposed - Variable	39			P1	Set Pressure plus Overpressure	1131.9 KPag		
	Pressure	Built-up	40		9 MPag					
	11033010	Total	41		9 MPag		Remarks			
	Allowable O		42	3.00.	10 %					
		sure / Blowdown(%)	43	Min. 0.87465 MPag / 1			<u>emark</u>			
	Required Ca		44		2 m3/h		Operating Pressure: 5.0 kg/m²g			
SIZING & SELECTION	Valve Actual	•	45		5 m3/h		Setting Pressure : 10.5 kg/m²g Design Pressure : 10.5 kg/m²g			
ECT	Calculated C		46		3 113/11 3125 mm²		Constant Back Pressure : kg/m²g			
SEL			47		32.9 mm²	- V	/ariable Back Pressure : kg/m²g			
& 5	Selected Orifice Area Orifice Dia.(mm)		48	D1(13)			Built-up Back Pressure : 0.1 kg/m²g			
N	Orifice Dia.(mm)		.J	-	·		RequiredCapacity : 0.6902 kg/h /alve Capacity : 6803.4 kg/h			
S				_		- v	тапус сараску . 0003.4 ку/п			
	Paint System	a & Color	49	See Rem	ark					
ETC	Test Gag	1 4 40101	50	Yes	uix					
ш	Bug screen		51	No No						
	bug screen		31	INO						

Ref. No : SLO200334-80-642297 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

	1			Pressure Sa	fety & Relief Va	lve	Specification and Calculation She	et	
0	R			Sheet No.	8 of 11		Rev . No	1	
	TAR J	OKWANG I.L.I		Project Name		Yeo	osu No.2 Complex Project(R2) 2nd PO		
	Since 1968		<u> </u>	Project No.			-		
			<u> </u>	Date 2021-01-2 Checked M.J.LEE			<u> </u>	S.W.PARK J.H.LEEM	
	P&ID No.		1	Checked		ПЕЗ	Approved 80-R2-PID-3040	J.M.LEEIVI	
ب	Tag No.		2				PSV-3404/3405		
GENERAL	Service Line		3				JBE OIL COOLER) PLATE SIDE		
GEN	Model No.		4	JSV-FF10		1 (LC	DE OIL COOLERY FLATE SIDE		
	Quantity		5	2	,,,		Calculation		
	Nozzle Type		6	Full Nozz	7 0		Calculation of Area		
	Design Type		7	Conventio			Calculation of Alca		
TYPE	Bonnet Type		8	Close	niai				
F	- ''	ever Type ap Type		None		Δ1	= 11.78*W1*(\(\sqrt{G}/(P1-Pb)\)/(Kd*Kb*Kc*	Kv)	
	7 .			Screwed	-	, , ,	= 11.70 W1 (VG/(1115))//(Rd Rb Rc	IXV)	
	Size. Inlet / (	Outlet	10	3/4"X1'			= 11.78*0.011667*\((0.981/(1131.9-9))	,	
CONN.	Inlet. Rating		12	ASME CL.15			= 11.76 0.011007	/	
S	Outlet. Ratin	·	13	ASME CL.15	, , , , ,	(			
	Body (Base)	g / ruemg	14	SA216 W			= <b>0.017567</b> mm²		
	Bonnet		15	SA216 W					
	Seat		16	316 SS-s					
IALS	Disc		17	316 SS-s	-		Calculation of Capacity		
MATERIALS	Guide		18	316 SS			carcaration of capacity		
MA	Gasket (Boni	net)	19	PTFE					
	Spring		20	316 SS			- W = A*Kd*Kb*Kc*Kv/(11.78*√(G/(P1-Pb)))		
	Bellows		21	None					
	Approved by			UV STAMP			= 132.9*0.615*1*1*0.376/(11.78*\(0.90)	81/(1131.9-9)))	
	Comply with		22	No					
	EN 10204	<del>-</del>	24	No			= 88.30 {/min		
BASIS	Code		25	API RP 520-Certification			= <b>5.3</b> m3/h		
eğ.	Fire		26	No					
	Sizing Basis		27	Thermal Expa	ansion				
	Rupture Disk	<	28	No		W	Valve Capacity	88.30 l/min	
	Fluid / State		29	CW / LIQU	۱ DIL	W1	Required Capacity	0.011667 {/min	
	Mol. Weight	/ Specific Gravity	30	0.981		Р	Set Pressure	1029 KPag	
	Compressibi	lity Factor	31	-		A1	Calculated Area	0.017567 mm²	
	Ratio of Spe	cific Heat	32	-	i	Α	Selected Area	132.9 mm²	
_	Viscosity		33	0.437 cl	P	Kd	Coefficient of Discharge	0.615	
TIOI	Operating /	Relieving Temp.	34	36 / 6	64.4 °C	G	Specific Gravity	0.981	
SERVICE CONDITION	Design Min.	/ Design Max. Temp.	35		65 ℃	Pb	Back Pressure	9 KPag	
00	Operating /	Set Pressure	36	0.539 / 1.029	) MPag	Kb	Correction Factor Due to Back Pressure	1	
/ICE	Design Press	sure / C.D.T.P	37	1.029 / 1.029	) MPag	Kc	Correction Factor for a rupture disk	1	
ERV		Superimposed - Constant	38	-	- MPag	Κv	Correction Factor due to Viscosity	0.376	
Vi	Back	Superimposed - Variable	39	-	- MPag	P1	Set Pressure plus Overpressure	1131.9 KPag	
	Pressure	Built-up	40	0.009	MPag		Remarks		
		Total	41	0.009	MPag		Keilidiks		
	Allowable O	<u>'</u>	42		10 %	*D.	emark		
		sure / Blowdown(%)	43	Min. 0.87465 MPag / 14			Pperating Pressure : 5.5 kg/m²g		
Z	Required Ca	pacity	44	0.0007	7 m3/h		letting Pressure : 10.5 kg/m²g		
SIZING & SELECTION	Valve Actual	· · ·	45		3 m3/h		Design Pressure : 10.5 kg/m³g		
ELE	Calculated C		46		'567 mm²		Constant Back Pressure : kg/m²g /ariable Back Pressure : kg/m²g		
& S	Selected Ori		47		32.9 mm²		ranable Back Pressure : kg/ull g Built-up Back Pressure : 0.1 kg/m²g		
NG	Orifice Dia.(mm)		48	D1(13)		- Built-up Back Pressure : 0.1 kg/m²g - RequiredCapacity : 11.772 kg/h			
SIZI				-			/alve Capacity : 294.3 kg/h		
				-					
U	Paint System	n & Color	49	See Rema	ark				
ETC	Test Gag		50	Yes					
	Bug screen		51	No					

Ref. No : SLO200334-90-642299 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2

				Pressure Sa	afety & Relief Va	lve	Specification and Calculation She	et	
	R			Sheet No.	9 of 11		Rev . No	1	
	Tok J	OKWANG I.L.I	Project Name			Yeo	osu No.2 Complex Project(R2) 2nd PO		
	Since 1968			Project No.	2021 21 22			CAMBARK	
				Date Checked	2021-01-22 M.J.LEE		<del>-iii</del>	S.W.PARK J.H.LEEM	
	P&ID No.		1	Checked		H53	0-R2-PID-3040	J.I I.LLLIVI	
ب	Tag No.		2				PSV-3406/3407		
GENERAL	Service Line		3				1A/B CYLINDER		
N N	Model No.		4	JSV-FF1		. 50	THE CTENDER		
	Quantity		5	2			Calculation		
	Nozzle Type		6	Full Noz	zle		Calculation of Area		
	Design Type		7	Convention			edicalation of Area		
YPE	Bonnet Type		8	Close					
F	Lever Type	, , , , , , , , , , , , , , , , , , ,		None		Α1	$= 11.78*W1*(\sqrt{G}/(P1-Pb))/(Kd*Kb*Kc*)$	Kv)	
	Сар Туре		9	Screwe			6 ( . 6, ( 2, , , (	,	
	Size. Inlet / (	Outlet	11	3/4"X1			= 11.78*0.016667*\(\sqrt{0.969/(1131.9-9)}\)	,	
CONN.	Inlet. Rating		12	ASME CL.1			= 11.70 0.010007	,	
2	Outlet. Ratin	·	13	ASME CL.1			•		
	Body (Base)	<i>ي ي</i>	14	SA216 W			= <b>0.016867</b> mm²		
	Bonnet		15	SA216 W					
10	Seat		16	316 SS-					
MATERIALS	Disc			316 SS-			Calculation of Capacity		
TER.	Guide		17 18	316 SS					
Ž	Gasket (Boni	net)	19	PTFE					
	-	Spring		316 SS	5	$W = A*Kd*Kb*Kc*Kv/(11.78*\sqrt{(G/(P1-Pb)))}$			
	Bellows		21	None	i i	]			
	Approved by		22	UV STAMP			= 132.9*0.615*1*1*0.556/(11.78*\(\sqrt{0.96}\)	69/(1131.9-9)))	
	Comply with		23	No					
	EN 10204	-	24	No			= 131.30 {/min		
BASIS	Code		25	API RP 520-Certification			= <b>7.9</b> m3/h		
-	Fire		26	No					
	Sizing Basis		27	Thermal Expansion					
	Rupture Disk	<	28	No	,	W	Valve Capacity	131.30 ℓ/min	
	Fluid / State		29	CW / LIQ	UID V	W1	Required Capacity	0.016667 {/min	
	Mol. Weight	/ Specific Gravity	30	0.969		Р	Set Pressure	1029 KPag	
	Compressibi	lity Factor	31	-	,	A1	Calculated Area	0.016867 mm²	
	Ratio of Spe	cific Heat	32	-		Α	Selected Area	132.9 mm²	
z	Viscosity		33	0.331 c	P I	Kd	Coefficient of Discharge	0.615	
₽	Operating /	Relieving Temp.	34	35 / 8	85.7 ℃	G	Specific Gravity	0.969	
ğ	Design Min.	/ Design Max. Temp.	35		65 ℃	Pb	Back Pressure	9 KPag	
SERVICE CONDITION	Operating /	Set Pressure	36	0.539 / 1.02	9 MPag	Kb	Correction Factor Due to Back Pressure	1	
/ICE	Design Press	sure / C.D.T.P	37	1.029 / 1.029	9 MPag	Kc	Correction Factor for a rupture disk	1	
ER.		Superimposed - Constant	38		- MPag I	Κv	Correction Factor due to Viscosity	0.556	
Vi	Back	Superimposed - Variable	39		- MPag I	P1	Set Pressure plus Overpressure	1131.9 KPag	
	Pressure	Built-up	40		9 MPag		Remarks		
		Total	41	0.00	9 MPag		Kellialks		
	Allowable O	<u>'</u>	42		10 %	*D.	emark		
		sure / Blowdown(%)	43	Min. 0.87465 MPag / 1		_	perating Pressure : 5.5 kg/m²g		
Z	Required Ca	· · ·	44		1 m3/h	- S	etting Pressure : 10.5 kg/m²g		
SIZING & SELECTION	Valve Actual Capacity		45		9 m3/h		Design Pressure : 10.5 kg/m²g		
ËLE	Calculated Orifice Area		46		6867 mm²		uilt-up Back Pressure : 0.1 kg/m²g equired Capacity : 0.969 kg/h		
8	Selected Orifice Area		47	·	32.9 mm²		alve Capacity: 775.2 kg/h		
NG	Orifice Dia.(mm)		48	D1(13)	)		. , , , , , , , , , , , , , , , , , , ,		
SIZ				-					
				-					
,	Paint System	n & Color	49	See Rem	ark				
ETC	Test Gag		50	Yes					
	Bug screen		51	No					

 Ref. No : SLO200334-100-642300
 JOKWANG I.L.I CO.,LTD.
 No.TTIPCF500-2

			Pressure Safety & Relief Valve Specification and Calculation Sheet					
J. K JOKWANG I.L.I				Sheet No.	10 of 11 Rev . No 1			
				Project Name	Yeosu No.2 Complex Project(R2) 2nd PO			
Since 1968			Project No.		2024 04 22			
				Date Checked	2021-01-22 M.J.LEE		-	J.H.LEEM
	P&ID No.		1			153	0-R2-PID-3037	7.1 1.EEE141
GENERAL	Tag No.		2	2		R2-PSV-3756A/B		
	Service Line		3			W-302-E (Cold Box)		
	Model No.		4	JSV-FF100				
	Quantity		5	2		Calculation		
TYPE	Nozzle Type		6	Full Nozzle		Calculation of Area		
	Design Type		7	Conventional		A1 = $13160*W1*(\sqrt{ZT/M})/(C*Kd*(P*1.21+101.325)$ $*Kb*Kc)$ = $13160*574*(\sqrt{1.008*136/3.2})/(356.06*0.831*$ $(5933*1.21+101.325)*1*1)$ = $22.952062$ mm <sup>3</sup>		
	Bonnet Type		8	Close				
	Lever Type		9	None				
	Cap Type		10	Screwed				
MATERIALS CONN.	Size. Inlet / Outlet		11	3/4"X1"				
	Inlet. Rating / Facing		12	ASME CL.600 RF				
	Outlet. Rating / Facing		13	ASME CL.150 RF				
	Body (Base)		14	SA351 CF8M				
	Bonnet		15	SA351 CF8M				
	Seat		16	316 SS-st.				
	Disc		17	316 SS-st.		Calculation of Capacity		
	Guide		18	316 SS		W = A*C*Kd*(P*1.21+101.325)*Kb*Kc/(13160*√(ZT/M))		
	Gasket (Bonnet)		19	PcTFE				
	Spring		20	316 SS				
	Bellows		21	None				
	Approved by		22	KGS UV STAMP		= 70.97*356.06*0.831*(5933*1.21+101.325)*1*1/ (13160*√(1.008*136/3.2))  = <u>1775</u> kg/h		
	Comply with NACE		23	No				
BASIS	EN 10204		24	No				
	Code		25	API RP 520				
	Fire		26	Yes				
	Sizing Basis		27	Fire Case				
	Rupture Disk		28	No		N	Valve Capacity	1775 kg/h
SERVICE CONDITION	Fluid / State		29	Hydrocarbon (HC) / GAS		/1	Required Capacity	574 kg/h
	Mol. Weight / Specific Gravity		30	3.2	P	P_	Set Pressure	5933 KPag
	Compressibility Factor		31	1.008	A	١1	Calculated Area	22.952062 mm²
	Ratio of Specific Heat		32	1.4	А	4	Selected Area	70.97 mm²
	Viscosity		33	0.008 c	:P Ko	ίd	Coefficient of Discharge	0.831
	Operating / Relieving Temp.		34	42 / -	.137 °C C		Coefficient base on Ratio of Specific Heat	356.06
	Design Min. / Design Max. Temp.		35	-196 ,	/ 66 °C T	Т	Kelvin Temperature	136 K
	Operating / Set Pressure		36	4.942 / 5.93		-	Molecular Weight	3.2
	Design Press	sure / C.D.T.P	37	5.933 / 5.903	<del> </del>	-	Compressibility Factor	1.008
		Superimposed - Constant	38		4 MPag KI	-	Correction Factor Due to Back Pressure	1
	Back Pressure	Superimposed - Variable	39		- MPag K	ίc	Correction Factor for a rupture disk	1
		Built-up	40		7 MPag	Remarks		
		Total	41	0.051	1 MPag	Kemarks		
	Allowable Overpressure		42	21 %		*Re	emark	
	Closing Pressure / Blowdown(%)		43	Min. 5.51769 MPag / 7%		Service Requirement : Cryogenic		
SIZING & SELECTION	Required Capacity		44		74 kg/h	, , ,		
	Valve Actual Capacity		45			- Operating Pressure: 50.4 kgf/m²g		
	Calculated Orifice Area		46	22.952062 mm²		- Setting Pressure : 60.5 kgf/m³g - Design Pressure : 60.5 kgf/m³g - Constant Back Pressure : 0.3 kgf/m³g		
	Selected Orifice Area		47	70.97 mm²				
	Orifice Dia.(mm)		48	D(9.5)		- Built-up Back Pressure : 0.222 kgf/m²g		
			$\vdash$	-				
	D: 16 1 2 6 1		Щ	-				
ETC	Paint System & Color		49	See Rem	ark			
Ε.	Test Gag		50	Yes				
	Bug screen		51	No				

Ref. No : SLO200334-110-642732 JOKWANG I.L.I CO.,LTD. No.TTIPCF500-2