




DEHDASHT PETROCHEMICAL INDUSTRY COMPANY
DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT



Contract No.: DPIC/98-12	DOCUMENT TITLE: PSV Calculation and Data Sheet	POI: IFA	Rev.: D0
	DOCUMENT No: DPIC9812-000-VD-1002-ME-DS-0045	Sheet 1 of 36	

PSV Calculation and Data Sheet

PURCHASER'S COMMENT/APPROVAL STATUS						Purchaser: NARGAN
1	AP: Approved (Released for Manufacturing)					
2	AN: Approved with Minor Comments (Fabrication may Proceed)					
3	NF: Approved with Comments (Fabrication not Proceed)					
4	RJ: Rejected					Item No. (Tag No.): PK-6101
5	NR: Not be Returned					
Date: XX.XX.XX		Signature:				Vendor Doc. No.: DPIC9812-000-VD-1002-ME-DS-0045
						
D0	24-Feb-22	IFA	Y.GHALAVAND	DR.A.NEJATI	DR.A.NEJATI	
REV.	DATE ISSUE	Purpose of Issue	PREPARED	CHECKED	APPROVED	



DEHDASHT PETROCHEMICAL INDUSTRY COMPANY
DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT



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Rev.: D0

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	DEHDASHT PETROCHEMICAL INDUSTRY COMPANY DEHDASHT HIGH DENSITY POLYETHYLENE PROJECT		
Contract No.: DPIC/98-12	DOCUMENT TITLE: PSV Calculation and Data Sheet	POI: IFA	Rev.: D0
	DOCUMENT No: DPIC9812-000-VD-1002-ME-DS-0045	Sheet 3 of 36	

PURPOSE:

The purpose of this document is to calculate pressure safety valves flow rates and orifice sizes based on the corresponding scenarios.

The calculation is performed by CONVAL 10 engineering software. Also, the calculation results are attached to this document.

ATTACHMENTS:

Calculations for PSVs are performed according to the following table:

PSV Tag	Related Equipment	Dominant Scenario	Max. Flowrate
PSV-61120	D-PK6101-2	Closed Outlet	27623 kg/h
PSV-61131	D-PK6101-2	Closed Outlet	27623 kg/h
PSV-61121	E-PK6101-3	Closed Outlet	8123 kg/h
PSV-61122	E-PK6101-3	Closed Outlet	19500 kg/h
PSV-61135	E-PK6101-3	Closed Outlet	19500 kg/h
PSV-61123	E-6101	Closed Outlet	19500 kg/h
PSV-61132	E-6101	Closed Outlet	19500 kg/h
PSV-61124	D-PK6101-3	Closed Outlet	19500 kg/h
PSV-61133	D-PK6101-3	Closed Outlet	19500 kg/h
PSV-61125	D-PK6101-1A	Closed Outlet	27623 kg/h
PSV-61128	D-PK6101-1B	Closed Outlet	27623 kg/h

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61120*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*



Design data

Design temperature *tD,max* *135.0* °C
 Design pressure *pD,max* *23.0* bar(g)

Pressures

Set pressure *pSet* *23.0* bar(g)
 Relieving pressure *p0*  *23.0* bar(g)
 Back pressure *pb*  *0.1* bar(g)






Properties at relieving conditions

Temperature of fluid *t1* *60.0* °C
 Density of fluid *ρ*  *53.688* kg/m³
 Isentropic exponent *κ*  *0.92611* -





Required flow capacity

Mass flow rate *qm* *27,623.0* kg/h
 Volume flow rate (standard conditions) *qn*  *14,714.0* m³/h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 1185.80408, 3" x 4", Type: K*
 Valve from database
 Rated coefficient of discharge (gas/vapor) *Kdr,G*  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	1,185.8	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	38.9	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.94	-
Required flow cross-section for Kdr	A0,min 	1,143.0	mm ²
Rated mass flow	qm,t 	28,659.0	kg/h
Rated volume flow	qn,t 	15,265.0	m ³ /h
Flow reserve	R 	3.7493	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61121*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature	tD,max	125.0	°C
Design pressure	pD,max	23.0	bar(g)


Pressures

Set pressure	pSet	23.0	bar(g)
Relieving pressure	p0 	23.0	bar(g)
Back pressure	pb 	0.1	bar(g)

Properties at relieving conditions

Temperature of fluid	t1	60.0	°C
Density of fluid	ρ 	53.688	kg/m ³
Isentropic exponent	κ 	0.92611	-





Required flow capacity

<input checked="" type="radio"/> Mass flow rate	qm	8,123.0	kg/h
<input type="radio"/> Volume flow rate (standard conditions)	qn 	4,326.8	m ³ /h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 506.4506, 2" x 3", Type: H*
 Valve from database
 Rated coefficient of discharge (gas/vapor) Kdr,G  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	506.45	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	25.4	mm
Nominal diameter of inlet	DN1 	2"	
Nominal diameter of outlet	DN2 	3"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.647	-
Required flow cross-section for Kdr	A0,min 	336.1	mm ²
Rated mass flow	qm,t 	12,240.0	kg/h
Rated volume flow	qn,t 	6,519.7	m ³ /h
Flow reserve	R 	50.683	%

Application

Maximum set pressure	p,max 	45.902	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61122*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature *tD,max* *135.0* °C
 Design pressure *pD,max* *23.0* bar(g)

Pressures

Set pressure *pSet* *23.0* bar(g)
 Relieving pressure *p0*  *23.0* bar(g)
 Back pressure *pb*  *0.1* bar(g)

Properties at relieving conditions

Temperature of fluid *t1* *60.0* °C
 Density of fluid *ρ*  *53.688* kg/m³
 Isentropic exponent *κ*  *0.92611* -





Required flow capacity

Mass flow rate *qm* *19,500.0* kg/h
 Volume flow rate (standard conditions) *qn*  *10,387.0* m³/h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 830.32092, 3" x 4", Type: J*
 Valve from database
 Rated coefficient of discharge (gas/vapor) *Kdr,G*  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	830.32	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	32.5	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.947	-
Required flow cross-section for Kdr	A0,min 	806.85	mm ²
Rated mass flow	qm,t 	20,067.0	kg/h
Rated volume flow	qn,t 	10,689.0	m ³ /h
Flow reserve	R 	2.9092	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

 The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61123*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*


Design data

Design temperature	tD,max	135.0	°C
Design pressure	pD,max	23.0	bar(g)

Pressures

Set pressure	pSet	23.0	bar(g)
Relieving pressure	p0 	23.0	bar(g)
Back pressure	pb 	0.1	bar(g)

Properties at relieving conditions

Temperature of fluid	t1	60.0	°C
Density of fluid	ρ 	53.688	kg/m ³
Isentropic exponent	κ 	0.92611	-





Required flow capacity

<input checked="" type="radio"/> Mass flow rate	qm	19,500.0	kg/h
<input type="radio"/> Volume flow rate (standard conditions)	qn 	10,387.0	m ³ /h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 830.32092, 3" x 4", Type: J*
 Valve from database
 Rated coefficient of discharge (gas/vapor) Kdr,G  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	830.32	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	32.5	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.947	-
Required flow cross-section for Kdr	A0,min 	806.85	mm ²
Rated mass flow	qm,t 	20,067.0	kg/h
Rated volume flow	qn,t 	10,689.0	m ³ /h
Flow reserve	R 	2.9092	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

 The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61124*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature	tD,max	135.0	°C
Design pressure	pD,max	23.0	bar(g)

Pressures

Set pressure	pSet	23.0	bar(g)
Relieving pressure	p0 	23.0	bar(g)
Back pressure	pb 	0.1	bar(g)

Properties at relieving conditions

Temperature of fluid	t1	60.0	°C
Density of fluid	ρ 	53.688	kg/m ³
Isentropic exponent	κ 	0.92611	-





Required flow capacity

<input checked="" type="radio"/> Mass flow rate	qm	19,500.0	kg/h
<input type="radio"/> Volume flow rate (standard conditions)	qn 	10,387.0	m ³ /h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 830.32092, 3" x 4", Type: J*
 Valve from database
 Rated coefficient of discharge (gas/vapor) Kdr,G  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	830.32	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	32.5	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.947	-
Required flow cross-section for Kdr	A0,min 	806.85	mm ²
Rated mass flow	qm,t 	20,067.0	kg/h
Rated volume flow	qn,t 	10,689.0	m ³ /h
Flow reserve	R 	2.9092	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

 The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61125*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature	tD,max	107.0	°C
Design pressure	pD,max	23.0	bar(g)

Pressures

Set pressure	pSet	23.0	bar(g)
Relieving pressure	p0 	23.0	bar(g)
Back pressure	pb 	0.1	bar(g)


Properties at relieving conditions

Temperature of fluid	t1	90.0	°C
Density of fluid	ρ 	42.543	kg/m ³
Isentropic exponent	κ 	0.99177	-





Required flow capacity

<input checked="" type="radio"/> Mass flow rate	qm	27,623.0	kg/h
<input type="radio"/> Volume flow rate (standard conditions)	qn 	14,714.0	m ³ /h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 1840.64148, 4" x 6", Type: L*
 Valve from database
 Rated coefficient of discharge (gas/vapor) Kdr,G  *0.975* -

Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	1,840.6	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	48.4	mm
Nominal diameter of inlet	DN1 	4"	
Nominal diameter of outlet	DN2 	6"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.68	-
Required flow cross-section for Kdr	A0,min 	1,284.0	mm ²
Rated mass flow	qm,t 	39,599.0	kg/h
Rated volume flow	qn,t 	21,093.0	m ³ /h
Flow reserve	R 	43.356	%

Application

Maximum set pressure	p,max 	46.46	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

 The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61128*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature	tD,max	107.0	°C
Design pressure	pD,max	23.0	bar(g)

Pressures

Set pressure	pSet	23.0	bar(g)
Relieving pressure	p0 	23.0	bar(g)
Back pressure	pb 	0.1	bar(g)



Properties at relieving conditions

Temperature of fluid	t1	90.0	°C
Density of fluid	ρ 	42.543	kg/m ³
Isentropic exponent	κ 	0.99177	-





Required flow capacity

<input checked="" type="radio"/> Mass flow rate	qm	27,623.0	kg/h
<input type="radio"/> Volume flow rate (standard conditions)	qn 	14,714.0	m ³ /h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 1840.64148, 4" x 6", Type: L*
 Valve from database
 Rated coefficient of discharge (gas/vapor) Kdr,G  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	1,840.6	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	48.4	mm
Nominal diameter of inlet	DN1 	4"	
Nominal diameter of outlet	DN2 	6"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.68	-
Required flow cross-section for Kdr	A0,min 	1,284.0	mm ²
Rated mass flow	qm,t 	39,599.0	kg/h
Rated volume flow	qn,t 	21,093.0	m ³ /h
Flow reserve	R 	43.356	%

Application

Maximum set pressure	p,max 	46.46	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61131*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature *tD,max* *135.0* °C
 Design pressure *pD,max* *23.0* bar(g)

Pressures

Set pressure *pSet* *23.0* bar(g)
 Relieving pressure *p0*  *23.0* bar(g)
 Back pressure *pb*  *0.1* bar(g)

Properties at relieving conditions

Temperature of fluid *t1* *60.0* °C
 Density of fluid *ρ*  *53.688* kg/m³
 Isentropic exponent *κ*  *0.92611* -





Required flow capacity

Mass flow rate *qm* *27,623.0* kg/h
 Volume flow rate (standard conditions) *qn*  *14,714.0* m³/h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 1185.80408, 3" x 4", Type: K*
 Valve from database
 Rated coefficient of discharge (gas/vapor) *Kdr,G*  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	1,185.8	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	38.9	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.94	-
Required flow cross-section for Kdr	A0,min 	1,143.0	mm ²
Rated mass flow	qm,t 	28,659.0	kg/h
Rated volume flow	qn,t 	15,265.0	m ³ /h
Flow reserve	R 	3.7493	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61132*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature *tD,max* *135.0* °C
 Design pressure *pD,max* *23.0* bar(g)

Pressures

Set pressure *pSet* *23.0* bar(g)
 Relieving pressure *p0*  *23.0* bar(g)
 Back pressure *pb*  *0.1* bar(g)

Properties at relieving conditions

Temperature of fluid *t1* *60.0* °C
 Density of fluid *ρ*  *53.688* kg/m³
 Isentropic exponent *κ*  *0.92611* -





Required flow capacity

Mass flow rate *qm* *19,500.0* kg/h
 Volume flow rate (standard conditions) *qn*  *10,387.0* m³/h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 830.32092, 3" x 4", Type: J*
 Valve from database
 Rated coefficient of discharge (gas/vapor) *Kdr,G*  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	830.32	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	32.5	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.947	-
Required flow cross-section for Kdr	A0,min 	806.85	mm ²
Rated mass flow	qm,t 	20,067.0	kg/h
Rated volume flow	qn,t 	10,689.0	m ³ /h
Flow reserve	R 	2.9092	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61133*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature *tD,max* *135.0* °C
 Design pressure *pD,max* *23.0* bar(g)

Pressures

Set pressure *pSet* *23.0* bar(g)
 Relieving pressure *p0*  *23.0* bar(g)
 Back pressure *pb*  *0.1* bar(g)

Properties at relieving conditions

Temperature of fluid *t1* *60.0* °C
 Density of fluid *ρ*  *53.688* kg/m³
 Isentropic exponent *κ*  *0.92611* -





Required flow capacity

Mass flow rate *qm* *19,500.0* kg/h
 Volume flow rate (standard conditions) *qn*  *10,387.0* m³/h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 830.32092, 3" x 4", Type: J*
 Valve from database
 Rated coefficient of discharge (gas/vapor) *Kdr,G*  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	830.32	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	32.5	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.947	-
Required flow cross-section for Kdr	A0,min 	806.85	mm ²
Rated mass flow	qm,t 	20,067.0	kg/h
Rated volume flow	qn,t 	10,689.0	m ³ /h
Flow reserve	R 	2.9092	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation

Calculation header

Identifier *Dehdasht Petrochemical*
 Tag No. *PSV-61135*



Medium selection and state

Phase *Single phase*
 Medium  *Propylene*
 State  *Gaseous*
 Gas *Gas, dry (Standard conditions)*

Design data

Design temperature	tD,max	135.0	°C
Design pressure	pD,max	23.0	bar(g)

Pressures

Set pressure	pSet	23.0	bar(g)
Relieving pressure	p0 	23.0	bar(g)
Back pressure	pb 	0.1	bar(g)

Properties at relieving conditions

Temperature of fluid	t1	60.0	°C
Density of fluid	ρ 	53.688	kg/m ³
Isentropic exponent	κ 	0.92611	-





Required flow capacity

<input checked="" type="radio"/> Mass flow rate	qm	19,500.0	kg/h
<input type="radio"/> Volume flow rate (standard conditions)	qn 	10,387.0	m ³ /h






Pressure relief valve

Calculation standard *API 520:2014*
 Valve manufacturer  *API 526*
 Series  *Spring-loaded*
 Material  *Carbon Steel*
 Valve selection  *A0: 830.32092, 3" x 4", Type: J*
 Valve from database
 Rated coefficient of discharge (gas/vapor) Kdr,G  *0.975* -


Pressure relief valve (continued)

<input checked="" type="radio"/> Narrowest flow cross-section	A0 	830.32	mm ²
<input type="radio"/> Narrowest flow diameter	d0 	32.5	mm
Nominal diameter of inlet	DN1 	3"	
Nominal diameter of outlet	DN2 	4"	
Pressure class	PN	class 300	

Results

Required discharge coefficient for A0	Kdr,min 	0.947	-
Required flow cross-section for Kdr	A0,min 	806.85	mm ²
Rated mass flow	qm,t 	20,067.0	kg/h
Rated volume flow	qn,t 	10,689.0	m ³ /h
Flow reserve	R 	2.9092	%

Application

Maximum set pressure	p,max 	45.592	bar(g)
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Feeding pipe

Inlet pipeline

Discharge pipe

Discharge pipe





Confirmation:

✓ The fluid data is calculated thermodynamically by means of FLUIDCAL

Comments:**Series**

Spring-loaded pressure-relief valves according to API Standard 526

Legend

-  Calculated value
-  Modified calculated value
-  Lookup value
-  Confirmation