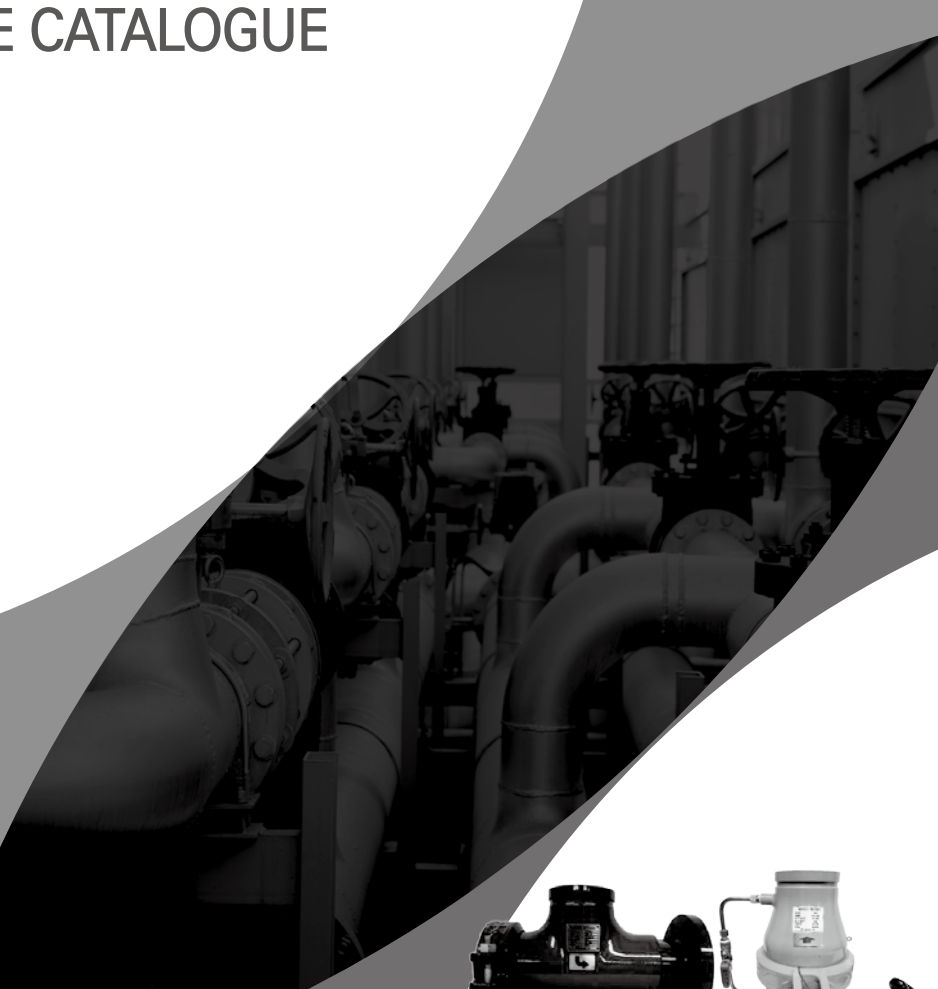


NEWASIA
ASIAJOINT

t.valop

STEEL PIPE VALVE CATALOGUE



NEWASIA
ASIAJOINT

<http://www.ajs.co.kr>



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- 05 CEO' s Greeting
- 06 Introduction and History
- 08 t. valop
- 09 Suction Diffuser
- 10 4in 1 Check Valve (Angle type)
- 11 4in 1 Check Valve (Horizontal type)
- 12 Hammerless Check Valve
- 13 Technical Information



CEO's Greeting



NEWASIA. Ready to big jump towards another coming 50 years.

We have always deeply appreciated to our customers who have consistently sent us strong support and encouragement. We have made many efforts to develop new products and new markets since company establishment in 1965 and provided high quality and innovative products in Korea and global market.

We have big vision to fit and support global customers through our progressive technology development and products. Currently NEWASIA(ASIAJOINT) expands sales networks not only in Korea but globally in Asian, Middle-east, European, American partners to meet diverse technical demands and services.

Dear customers,
We will continue robust technology development to challenge and boast a 100-year legacy company and commit to implement the Safety, Speed, customer Satisfaction in global fitting and piping industries.
Deep appreciation again and looking forwards to your keeping strong support and attention.

President **Lee SangHeon**

NewAsia has been frontrunner in fitting and pipe system industries.

NEWASIA, Morethan 50-year history in Korean fitting and pipe system since 1965.

We are going to jump to 21st century's leading company and commit to implement the
Safety, Speed, customer Satisfaction.

To this end,

All staffs of NEWASIA consistently create innovative products and technology and we
also build the win-win network harmonized with dynamic and stability with related
partners, as well as domestic, global companies.



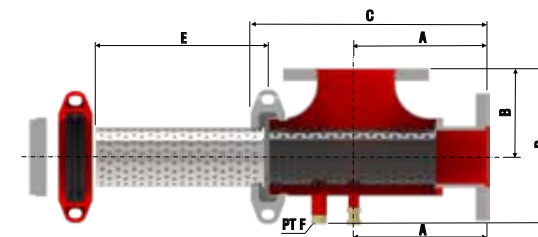
- 1965.10 Hyundai machine industries was established
- 1978.06 Incorporated to Asia Bend co.,Ltd
- 1981.04 Acquired factory in Yeosu
- 1983.07 Authorized to stamp Korean standard (KS B 1522, KS B1541, KS B 1543)
- 1989.08 On the public in KOSDAQ
- 1994.12 Developed and manufacturing Asia grooved joints (Hom joint)
- 1996.07 Certified JIS (Japan standard)
- 1997.03 Authorized to manufacturer of grooved joints by KR/LR/ABS/BV
- 1999.09 As Underwriter's Laboratory(UL) and Factory Manual(FM)
- 2000.02 Acquired ISO9001 certification
- 2001.02 Designated No.267 the new technology for Ring joint by Government
- 2002.11 Acquired certificate as Excellent product by public procurement service
- 2005.12 company name change to AJS co., Ltd
- 2006.11 Acquired NEP by Korean Government
- 2007.04 Acquired ANSI/ NSF61(STS fittings)
- 2008.03 Acquired certificate ASME(American Society of Mechanical Engineers)
- 2009.04 Acquired YongIn factory and 3 KS certificates in STS pipes
- 2011.11 Acquired KC(Korea Certification mark) for carbon & STS fitting, grooved joints
- 2011.12 Designated as World class products by Korean Government
- 2014.03 Inaugurated president Lee Sangheon
- 2015.02 Acquired certificate KWWA CP for grooved joints
- 2017.04 Expanded production YongIn factory UHP tube for semiconductor & Pharmaceuticals
- 2017.07 Company name change to Newasia joint. Co., Ltd
- 2017.12 YongIn factory acquired KSD3576. KSD3585. KSD3595 for STS tube.
- 2017.12 YongIn acquired KC certificate for STS tube
- 2018.09 Registered Patent of valves made from carbon steel pipe
- 2018.10 Registered patents for non-welding sprinkler system (3 unique products)
- 2019.10 Registered patents of One-stop grooved joints
- 2020.06 Selected as an InnoBiz company
- 2021.01 Acquired ISO 14001 certification
- 2021.02 Authorized to manufacturer of welded fittings (carbon, STS)by KR/BV/GL/DNV
- 2021.09 Selected as a Main-Biz company
- 2021.12 Selected as a partner company of Daewoo shipbuilding & Marine Engineering(DSME)
- 2022.03 Company name change to NEWASIA. Co., Ltd
- 2022.05 Selected as a promising 100 Green NewDeal company by Government
- 2022.05 Selected as an IP-Star company by Korean Intellectual Property Office



t.valop is?

As a new concept of steel pipe valve, it means to develop the valve by using a Tee as the valve body.
t. valop = tee + valve + developpe

Suction Diffuser



• Specification

Applicable Fluid		Water
Applicable Inlet Press.	10K	☐ Max. 10kg/ cm ²
	20K	☐ Max. 20kg/ cm ²
Applicable Temp.(Max.)		Water: 110 °C
Hydrostatic Test	10K	☐ Max. 15kg/ cm ²
	20K	☐ Max. 30kg/ cm ²
End Connection	ASC-1FF	KS 10K FF (50~250A) KS 10K RF (300~500A)
	ASC-2FF	KS 20K RF Flanged
	ASC-1GF, 2GF	In x Out: Grooved x Flanged
	ASC-1GG, 2GG	In x Out: Grooved x Grooved

Material

- Body : SPP, SPPS250
- Screen : Stainless Steel
- Gasket : EPDM

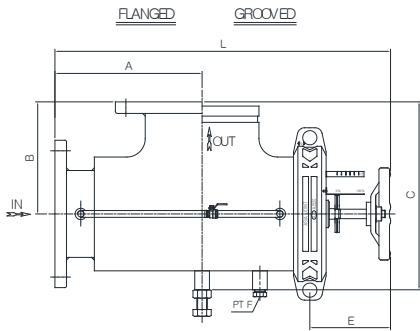
SIZE (In x Out)	Dimensions							Drain PT
	A		B		C	D	E	
	Flanged	Grooved	Flanged	Grooved				
2 x 1.5	140	136	85	81	250	160	155	3/8"
2 x 2	160	155	94	90	282	176	181	
2.5 x 2	160	155	98	94	282	180	181	
2.5 x 2.5	165	161	102	98	294	192	194	
3 x 2 3 x 2.5	165	161	105	101	294	195	194	
3 x 3	190	186	125	121	345	225	243	
4 x 2 4 x 2.5 4 x 3	190	186	131	125	345	232	243	
4 x 4	220	214	145	139	395	268	283	
5 x 2.5 5 x 3 5 x 4	220	214	154	146	395	275	283	1/2"
5 x 5	240	234	166	158	435	298	319	
6 x 3 6 x 4 6 x 5	240	234	173	165	435	305	319	
6 x 6	280	272	204	196	520	366	397	
8 x 4 8 x 5 8 x 6	280	272	213	205	520	375	397	

n	SIZE (In x Out)	Dimensions							
		A		B		C	D	E	Drain
		Flanged	Grooved	Flanged	Grooved				PT F
F	8 x 8	315	307	238	230	592	438	469	1"
	10 x 5								
	10 x 6	315	307	250	242	592	450	469	
	10 x 8								
	10 x 10	360	352	276	268	675	506	541	
	12 x 6								
	12 x 8	360	352	287	279	675	515	541	
	12 x 10								
	12 x 12	370	361	288	280	700	535	561	
	14 x 10								
	14 x 12	370	361	298	290	700	545	561	
	14 x 14								
	16 x 12	395	386	323	315	750	595	611	
	16 x 14								
	16 x 16	435	425	338	330	816	647	676	
	18 x 14								
	18 x 16	435	425	351	343	816	660	676	
	18 x 18	475	465	376	368	896	702	750	
	20 x 16								
	20 x 18	495	485	389	380	916	715	770	
	20 x 20	545	536	442	432	1020	822	851	

4 in 1 Check Valve (Angle Type)



Angle Type



• Specification

Applicable Fluid		Water
Applicable Inlet Press.	10K	☐ Max. 10kg/ cm ²
	20K	☐ Max. 20kg/ cm ²
Applicable Temp.(Max.)		Water: 110 °C
Hydrostatic Test	10K	☐ Max. 15kg/ cm ²
	20K	☐ Max. 30kg/ cm ²
End Connection	AAC-1FF	KS 10K FF (80~250A)
	AAC-2FF	KS 20K RF Flanged
	AAC-1FG, 2FG	In x Out : Flanged x Grooved
	AAC-1GG, 2GG	In x Out: Grooved x Grooved

Material

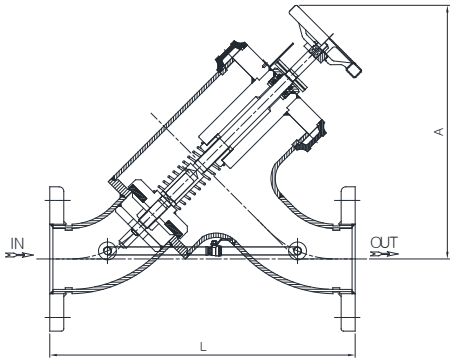
- Body : SPP, SPSP250
- Gasket : EPDM

SIZE (Out x In)	Dimensions							Drain PT F
	A		B		C	E	L	
	Flanged	Grooved	Flanged	Grooved				
3 x 2.5	180	176	105	101	170	301	387	3/8"
3 x 3	210	206	125	121	203	345	447	
4 x 2.5	210	206	131	125	209	343	443	
4 x 3	210	206	131	125	209	345	447	
4 x 4	235	231	145	139	245	413	516	1/2"
5 x 3	235	231	154	146	254	394	493	
5 x 4	235	229	154	146	254	413	516	
5 x 5	260	254	166	158	285	467	570	
6 x 4	260	254	173	165	292	452	560	
6 x 5	260	254	173	165	292	467	570	
6 x 6	300	292	204	196	349	550	657	
8 x 5	300	292	213	205	358	561	656	
8 x 6	300	292	213	205	358	550	657	1"
8 x 8	340	332	238	230	414	635	751	
10 x 6	340	332	250	242	426	622	734	
10 x 8	340	332	250	242	426	635	750	
10 x 10	385	377	276	268	478	747	858	
12 x 8	385	377	287	279	489	720	832	
12 x 10	385	377	287	279	489	747	858	
14 x 10	395	386	298	290	518	776	885	
16 x 12	435	426	323	315	569	879	1000	
18 x 14	475	465	361	353	640	992	1090	
20 x 16	520	512	400	391	704	1109	1230	

4 in 1 Check Valve (Horizontal Type)



Horizontal Type



• Specification

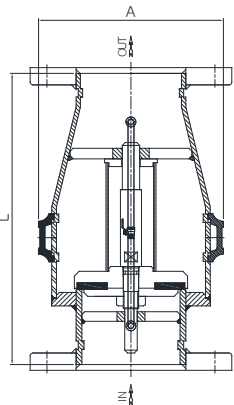
Applicable Fluid		Water
Applicable Inlet Press.	10K	☐ Max. 10kg/ cm ²
	20K	☐ Max. 20kg/ cm ²
Applicable Temp.(Max.)		Water: 110 °C
Hydrostatic Test	10K	☐ Max. 15kg/ cm ²
	20K	☐ Max. 30kg/ cm ²
End Connection	AFC-1FF	KS 10K FF (50~250A)
	AFC-2FF	KS 20K RF (300~400A)
	AFC-2FF	KS 20K RF Flanged
	AAC-1GG, 2GG	Grooved

Material

- Body : SPP, SPSP250
- Gasket : EPDM

SIZE (in)	Dimensions		
	L		A(Full Open)
	Flanged	Grooved	Flanged, Grooved
2	271	261	250
2.5	310	300	284
3	295	356	328
4	363	420	393
5	455	508	463
6	550	604	535
8	694	760	622
10	830	910	712
12	974	1075	858
14	1120	1100	930
16	1256	1246	1080

Hammerless Check Valve



Specification

Applicable Fluid		Water
Applicable Inlet Press.	10K	☐ Max. 10kg/cm ²
	20K	☐ Max. 20kg/cm ²
Applicable Temp.(Max.)		Water: 110 °C
Hydrostatic Test	10K	☐ Max. 15kg/cm ²
	20K	☐ Max. 30kg/cm ²
End Connection	AHC-1FF	KS 10K FF (50~250A) KS 20K RF (300~400A)
	AHC-2FF	KS 20K RF Flanged
	AHC-1GG, 2GG	Grooved

- Material
- Body : SPP, SPPS250
 - Gasket : EPDM

SIZE (in)	Dimensions		
	L		A
	Flanged	Grooved	
2	238	230	116
2.5	255	245	145
3	270	262	170
4	315	303	193
5	330	314	255
6	385	370	315
8	435	420	370
10	525	507	415
12	615	597	470
14	675	655	520
16	795	779	575

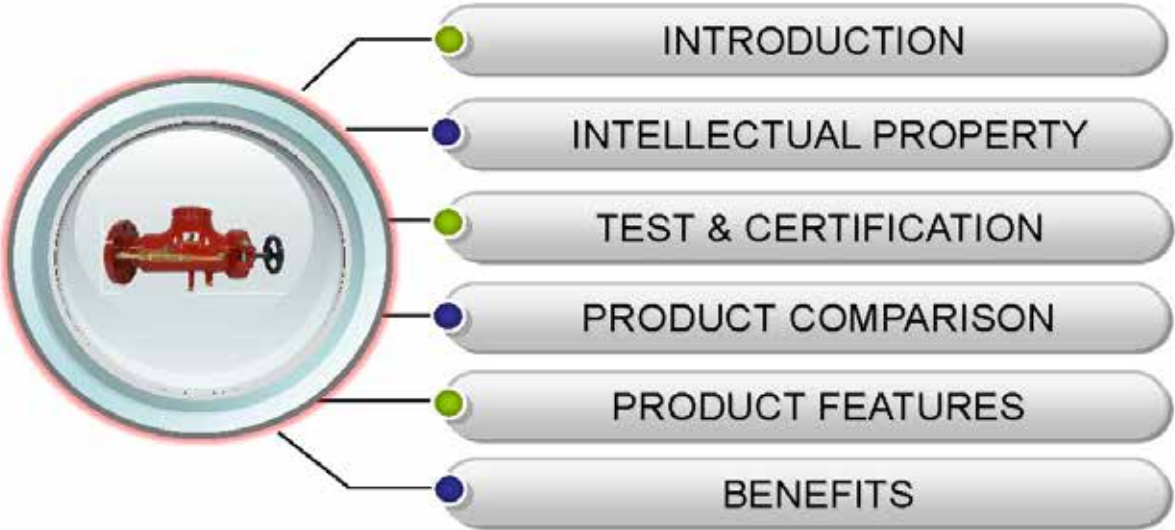
Technical Information

Suction Diffuser

4 in 1 Check Valve (Angle, Horizontal)

Hammerless Check Valve

CONTENTS



INTRODUCTION

1. Steel Pipe Valve [t.valop]

Steel Pipe Valve?
A valve manufactured using TEE, Elbow, etc., which are parts of the pipe, instead of casting material (cast iron) for the valve body while maintaining the function of the valve.

t.valop?
As a new concept of steel pipe valve, it means to develop the valve by using a Tee as the valve body.
<t.valop = tee + valve + develop>

Why Steel Pipe Valve?

- SAFETY

1) No risk of leakage because of finer grain structure
2) No material defect
3) Impact resistance to external factors

- LOW COST

1) Construction time reduction due to the light weight
2) Use of existing piping fittings

- VERSATILITY

1) Various type (flange, groove) of the inlet & outlet
2) No restriction on flange specification
3) Easy to assemble and disassemble with coupling type
4) Reusable gasket

INTRODUCTION

1. Steel Pipe Valve

A. Suction Diffuser	Size : 2" x 1.5" ~ 20" x 20"	Max. Press. - 10K - 20K - Class 150 - PN 16	Type - Grooved - Flanged - Welded
B. 4 in 1 Check Valve	Size : 3" x 2.5" ~ 20" x 16"		
C. Hammerless Check Valve	Size : 2" ~ 16"		

Model [(1)-(2)(3)(4)] [ex. ASC-3GF, AAC-3FG or AHC-3GG]							
[1] Product Name		[2] Max. Press.		[3] Inlet Type		[4] Outlet Type	
Suction Diffuser	ASC	10K	1	Grooved	G	Grooved	G
4 in 1 Check Valve [Angle]	AAC	20K	2	Flanged	F	Flanged	F
4 in 1 Check Valve [Horizontal]	AFC	Class 150	3	Welded	W	Welded	W
Hammerless Check Valve	AHC	PN 16	4				

INTRODUCTION

1. Steel Pipe Valve

A. Suction Diffuser



[Horizontal Type]

B. 4 in 1 Check Valve



[Angle Type]

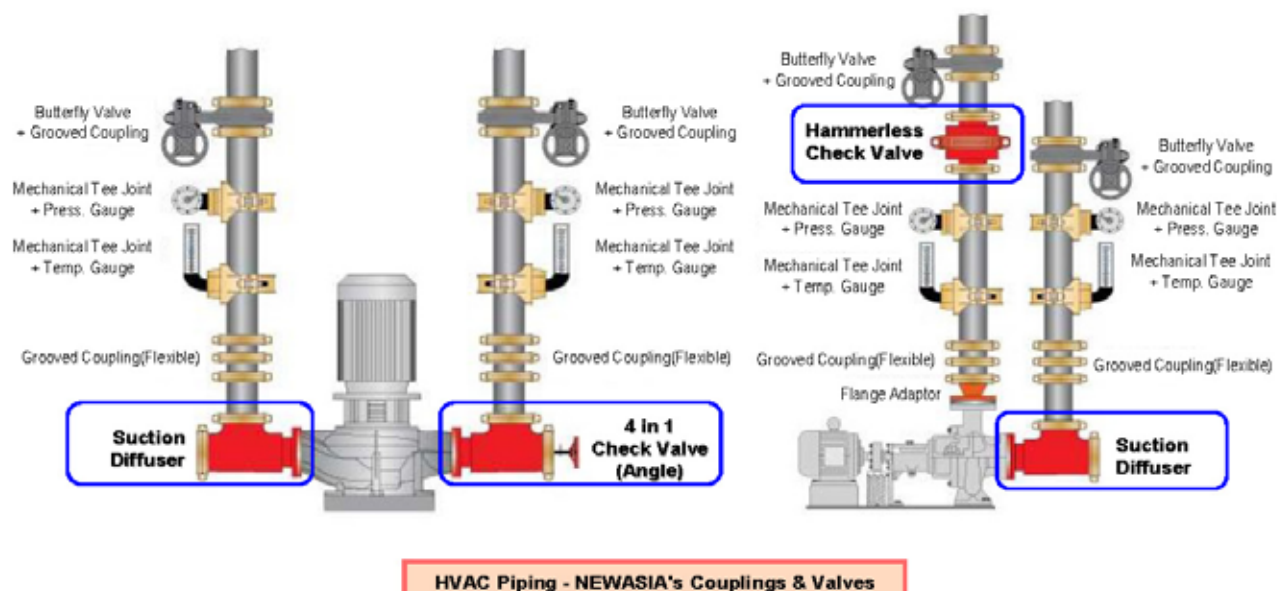


C. Hammerless Check Valve



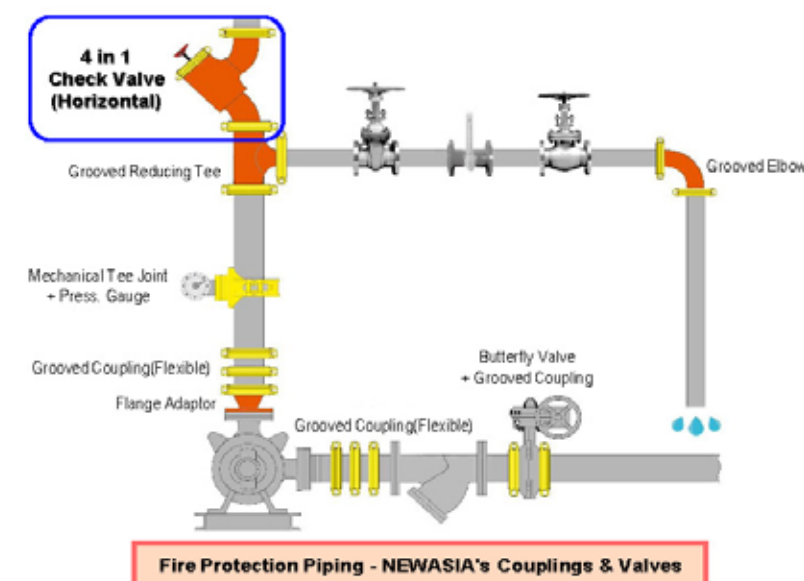
INTRODUCTION

2. Installation

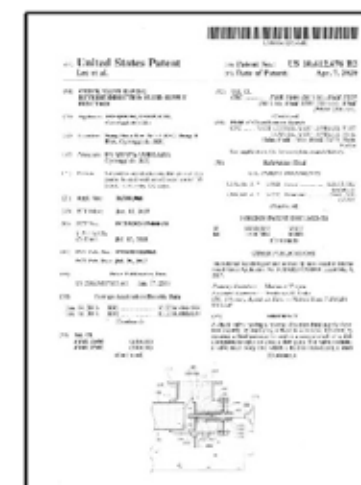


INTRODUCTION

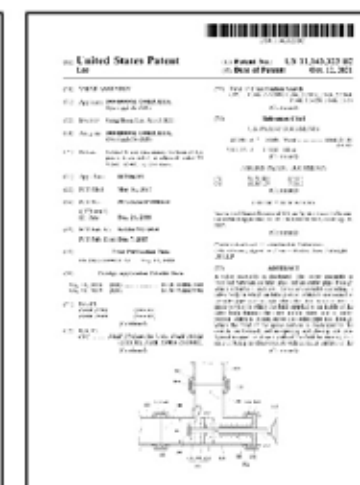
1. Installation



INTELLECTUAL PROPERTY



Check valve capable of supplying fluid in a reverse direction



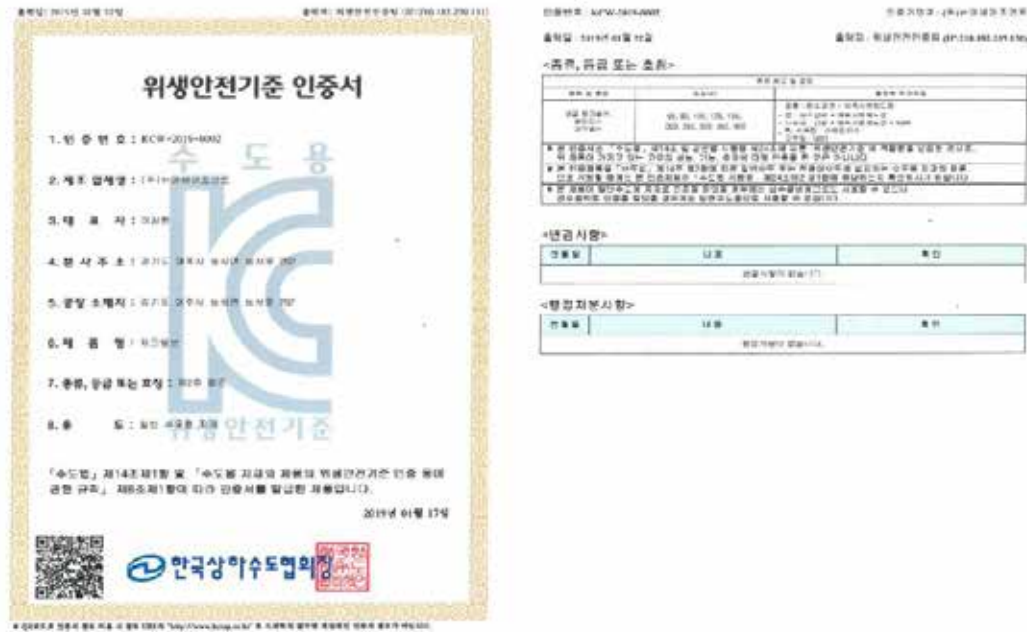
Valve assembly

[Status]

- Domestic Patent - Registration : 7ea
- Domestic Design Patent - Registration : 16ea
- Trademark - 4in1 Check Valve : 2ea - t.valop : 2ea (pending)
- Overseas Patent - Registration : 12ea - Pending : 4ea [USA, JAPAN, CHINA, UAE, SAUDIARABIA, EUROPE, INDIA]
- Overseas Design Patent - Registration : 9ea - Pending : 1ea [USA, JAPAN, CHINA, EUROPE, SAUDIARABIA]

TEST & CERTIFICATION

KC Certification



TEST & CERTIFICATION

SEISMIC TEST



- Test Institute : Seismic Research and Test Center (SESTEC)
- Test : NFPA13 Vertical Pipe Displacement Loading Test

Item	Press. (MPa)	Loading Rate (mm/s)	Displacement (mm)	Test Result	
				Leakage	Rupture
TEST 1	2	24	± 60	ok	ok
TEST 2	2	24	±100	ok	ok
TEST 3	2	24	±150	ok	ok



TEST & CERTIFICATION

SEISMIC TEST [4in1 Check Valve]

- Test Institute : SGS Korea
- Test : Seismic test including performance test

Specimen 1.
2" x 2.5" (20K)



Specimen 2.
5" x 4" (10K)



Division	Evaluation	Test	Test Condition - Specimen1, 80A18"b65A12.5" 20K 4in1 Check Valve	Criteria
Before Seismic Test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 82 kg/cm ² (8.14 MPa)	No leakage for 8 min.
	Leakage	Check	Design Press./outlet x 1.6 = 32 kg/cm ² (3.14 MPa)	No leakage for 1 min.
	Leakage	Shut off	Design Press./inlet x 1.2 = 24 kg/cm ² (2.36 MPa)	No leakage for 1 min.
Seismic Test	Seismic	Seismic	Seismic Test Criteria (Standard)	-
After Seismic Test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 82 kg/cm ² (8.14 MPa)	No leakage for 8 min.
	Leakage	Check	Design Press./outlet x 1.6 = 32 kg/cm ² (3.14 MPa)	No leakage for 1 min.
	Leakage	Shut off	Design Press./inlet x 1.2 = 24 kg/cm ² (2.36 MPa)	No leakage for 1 min.

Division	Evaluation	Test	Test Condition - Specimen2, 125A15"b100A11" 10K 4in1 Check Valve	Criteria
Before Seismic Test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 16 kg/cm ² (1.57 MPa)	No leakage for 8 min.
	Leakage	Check	Design Press./outlet x 1.6 = 16 kg/cm ² (1.57 MPa)	No leakage for 1 min.
	Leakage	Shut off	Design Press./inlet x 1.2 = 12 kg/cm ² (1.18 MPa)	No leakage for 1 min.
Seismic Test	Seismic	Seismic	Seismic Test Criteria (Standard)	-
After Seismic Test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 16 kg/cm ² (1.57 MPa)	No leakage for 8 min.
	Leakage	Check	Design Press./outlet x 1.6 = 16 kg/cm ² (1.57 MPa)	No leakage for 1 min.
	Leakage	Shut off	Design Press./inlet x 1.2 = 12 kg/cm ² (1.18 MPa)	No leakage for 1 min.



TEST & CERTIFICATION

SEISMIC TEST [4in1 Check Valve]

- Test Institute : SGS Korea
- Test : Seismic test



Seismic Test



X axis



Y axis

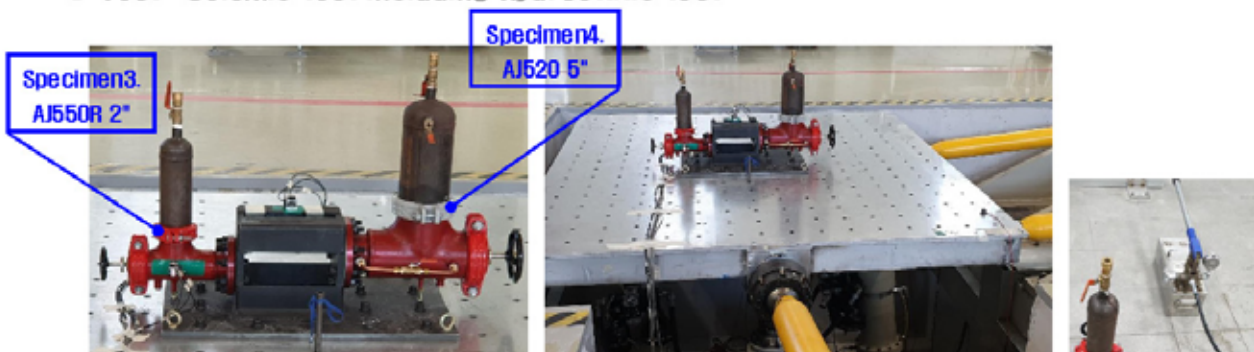


Z axis

TEST & CERTIFICATION

SEISMIC TEST (Rigid Grooved Coupling)

- Test Institute : SGS Korea
- Test : Seismic test including hydrostatic test



Division	Evaluation	Test	Test Condition	Criteria
Before Seismic Test	Hydrostatic	Body Hydrostatic	Specimen3, AJ550R 80A18" L Specimen4, AJ520 125A15" L Rigid Coupling 36 kg/cm ² (3.54 MPa)	No leakage for 3 min.
Seismic Test	Seismic	Seismic	Seismic Test Criteria (Standard)	-
After Seismic Test	Hydrostatic	Body Hydrostatic	36 kg/cm ² (3.54 MPa)	No leakage for 3 min.

TEST & CERTIFICATION

SEISMIC TEST (Rigid Grooved Coupling)

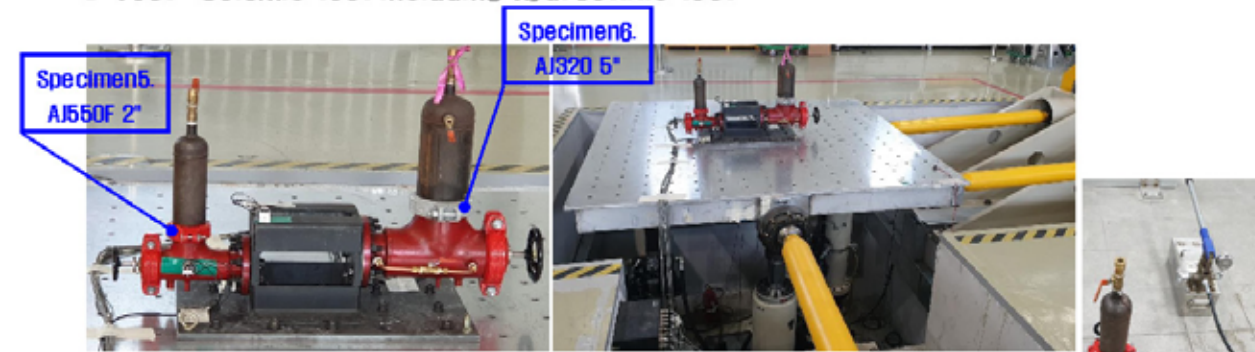
- Test Institute : SGS Korea
- Test : Seismic test



TEST & CERTIFICATION

SEISMIC TEST (Flexible Grooved Coupling)

- Test Institute : SGS Korea
- Test : Seismic test including hydrostatic test



Division	Evaluation	Test	Test Condition	Criteria
Before Seismic Test	Hydrostatic	Body Hydrostatic	Specimen5, AJ550F 80A18" L Specimen6, AJ320 125A15" L Flexible Coupling 36 kg/cm ² (3.54 MPa)	No leakage for 3 min.
Seismic Test	Seismic	Seismic	Seismic Test Criteria (Standard)	-
After Seismic Test	Hydrostatic	Body Hydrostatic	36 kg/cm ² (3.54 MPa)	No leakage for 3 min.

TEST & CERTIFICATION

SEISMIC TEST (Flexible Grooved Coupling)

- Test Institute : SGS Korea
- Test : Seismic test



TEST & CERTIFICATION

Seismic Test

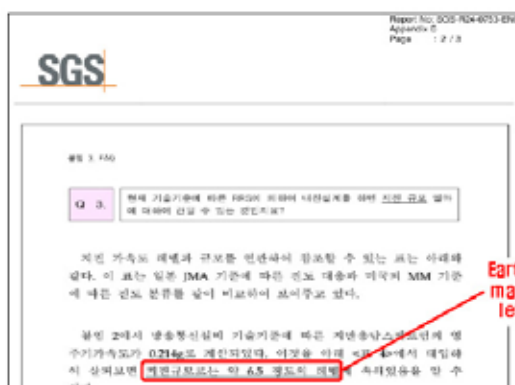
- Test Institute : SGS Korea
- Test Result : Seismic Test **SATISFIED**

Report No: SGS-R24-0753-EN00
Page : 20 / 24

7.2 Seismic test results

Table 14: Seismic test results

Seismic test	TRIS-RHS (TRIS - RHS)	Cohesion (0.5 and less)	Structural integrity	Functionality
1st seismic test	Enveloped	Satisfied	No abnormality	No abnormality
2nd seismic test	Enveloped	Satisfied	No abnormality	No abnormality



7. RESULTS

7.1 Summary of the test results

Table 11: Test results

Test date	Check list	Acceptance criteria	Result
2019. 11. 20	Functional test before and after the seismic test.	Refer to table 5 and 6	Refer to table 12, 13
2019. 11. 20	The maximum single amplitude deflection at the top of the framework (should not exceed 75 mm)	The maximum single amplitude deflection at the top of the framework (under 75 mm)	N/A
2019. 11. 20	Roller of the specimen.	There is no roller	No abnormalities
2019. 11. 20	Deviation or breakage of the fixed part of specimen should not occur.	There is no deviation or breakage	No abnormalities
2019. 11. 20	Deviation of installed components.	There is no deviation or breakage	No abnormalities
2019. 11. 20	Deformation or breakage of the specimen frame should not occur.	There is no deformation or breakage	No abnormalities
2019. 11. 20	The joint part of the floor facility shall not deviate or the shaking table fixing part shall not be detached.	There is no deviation or breakage	N/A
2019. 11. 20	Cracks, deformation and cutting of the fixing device itself such as anchoring and bolt should not occur.	There is no crack, deformation and cut-off	No abnormalities
2019. 11. 20	Any other deformation or breakage that can be confirmed with the naked eye should not occur.	There is no deformation or breakage	No abnormalities

※ The performance test was conducted according to the procedure provided by the applicant.

TEST & CERTIFICATION

Seismic Test

- Test Institute : SGS Korea
- Test : Seismic test **SATISFIED** [including hydrostatic, check, shut off]

Table 12: Summary of Functional test method - Specimen (B5A X 65A_20K)

Process	Evaluation	Test	Test Condition	Criteria	Result
Before seismic test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 32 kg/cm ² (3.14 MPa)	Should be leak-free after 3 minutes	No abnormalities
	Leakage	Check	Design Press. @outlet x 1.6 = 32 kg/cm ² (3.14 MPa)	Should be leak-free after 1 minutes	No abnormalities
	Leakage	Shut off	Design Press. @inlet x 1.2 = 24 kg/cm ² (2.36 MPa)	Should be leak-free after 1 minutes	No abnormalities
After seismic test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 32 kg/cm ² (3.14 MPa)	Should be leak-free after 3 minutes	No abnormalities
	Leakage	Check	Design Press. @outlet x 1.6 = 32 kg/cm ² (3.14 MPa)	Should be leak-free after 1 minutes	No abnormalities
	Leakage	Shut off	Design Press. @inlet x 1.2 = 24 kg/cm ² (2.36 MPa)	Should be leak-free after 1 minutes	No abnormalities

※ The performance test was conducted according to the procedure provided by the applicant.



Table 13: Summary of Functional test method - Specimen (125A X 100A_10K)

Process	Evaluation	Test	Test Condition	Criteria	Result
Before seismic test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 16 kg/cm ² (3.14 MPa)	Should be leak-free after 3 minutes	No abnormalities
	Leakage	Check	Design Press. @outlet x 1.6 = 16 kg/cm ² (3.14 MPa)	Should be leak-free after 1 minutes	No abnormalities
	Leakage	Shut off	Design Press. @inlet x 1.2 = 12 kg/cm ² (2.36 MPa)	Should be leak-free after 1 minutes	No abnormalities
After seismic test	Hydrostatic	Body Hydrostatic	Design Press. x 1.6 = 16 kg/cm ² (3.14 MPa)	Should be leak-free after 3 minutes	No abnormalities
	Leakage	Check	Design Press. @outlet x 1.6 = 16 kg/cm ² (3.14 MPa)	Should be leak-free after 1 minutes	No abnormalities
	Leakage	Shut off	Design Press. @inlet x 1.2 = 12 kg/cm ² (2.36 MPa)	Should be leak-free after 1 minutes	No abnormalities

※ The performance test was conducted according to the procedure provided by the applicant.

TEST & CERTIFICATION

Great Kobe Earthquake

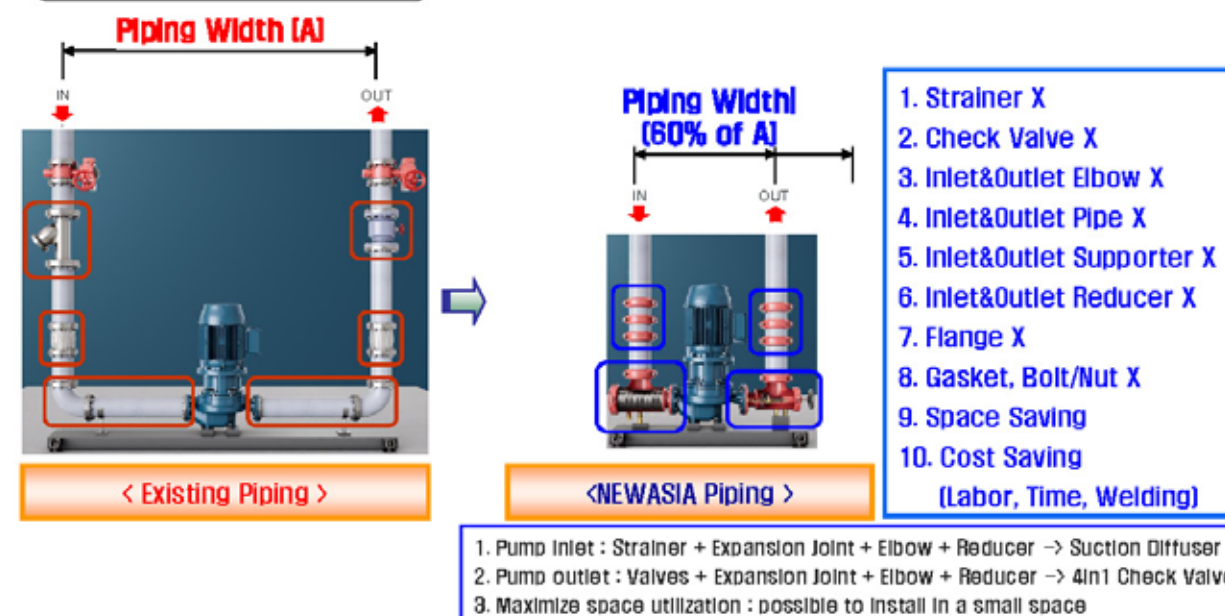
1. Date : 1995. 1. 17
2. Epicenter : northern end of Awaji Island, 20 km away from the center of the city of Kobe.
3. Magnitude : **7.3** [about for 15 sec.]
4. Damage
 - A. Casualties : **6310 killed / 43,188 injured**
 - B. Monetary loss : **Buildings Destroyed 209,087 / Fires : 294**



PRODUCT COMPARISON

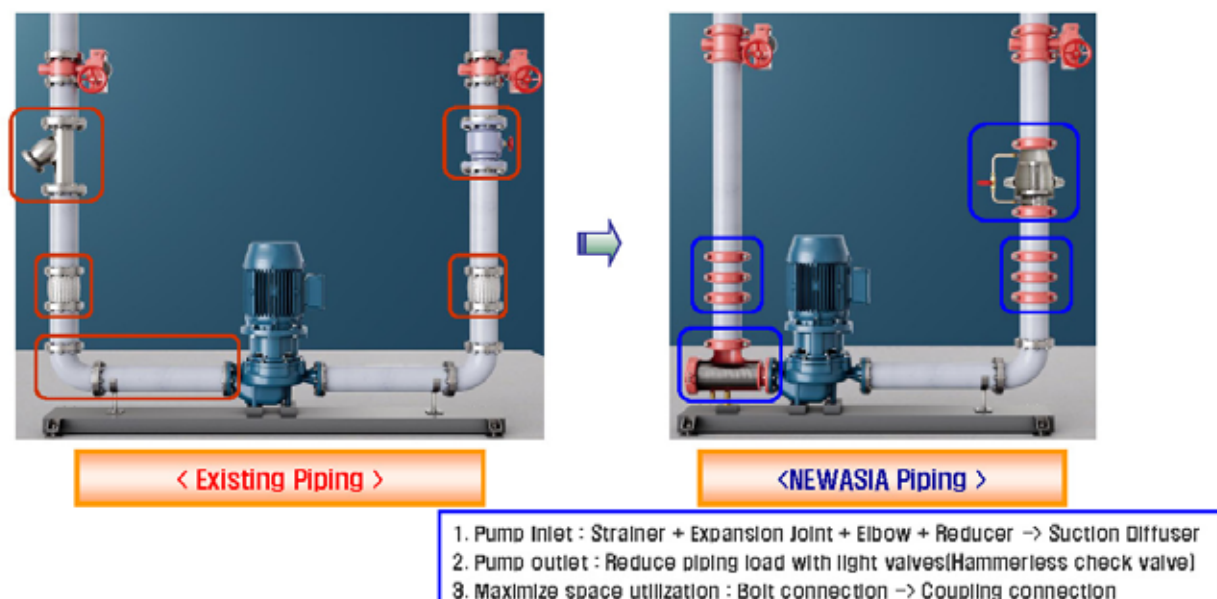
1. NEWASIA Method

Suction Diffuser + 4in1 Check Valve



PRODUCT COMPARISON

2. NEWASIA Method Suction Diffuser + Hammerless Check Valve



PRODUCT COMPARISON

3. Casting Valve VS Steel Pipe Valve

	Casting Valve	Steel Pipe Valve
Shape		
Seismic load	- No Guarantee from earthquake - Vulnerable to earthquakes due to flange connection - Brittle and fragile in tension	The seismic performance of the valve is qualified. - Verified in seismic testing at magnitude 6.5 - Excellent seismic resistance with a coupling method that absorbs pipe's displacement. - Satisfied the requirement of vertical pipe displacement loading test in NFPA13.
Weight (note 1)	As the pressure increases, the body wall thickness and piping stress increases rapidly.	Since the steel pipe is used as the body, the thickness change due to the pressure increase is small.
Versatility	Difficult to meet the various length related to face to face dimension.	Possible to meet the various length related to face to face dimension.

PRODUCT COMPARISON

3. Casting Valve VS Steel Pipe Valve

	Casting Valve	Steel Pipe Valve
Shape		
Maintenance	To disassemble and assemble, a lot of bolts must be removed.	To disassemble and assemble, only 2ea bolts must be removed.
Cost	Worse competitive price (heavy body weight)	Better competitive price (light body weight)
Strength	Low pressure reliability (porosity in cast iron)	High pressure reliability (more durable and stronger)
Delivery	Long (60 days delivery time) - difficult to change the connection type (note 2)	Fast (30 days delivery time) - easy to change the connection type

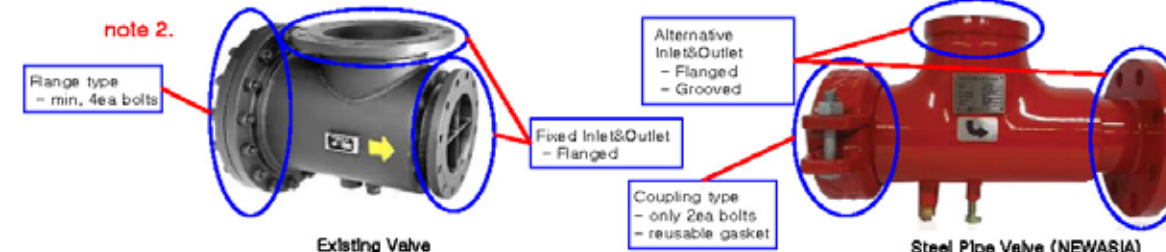
PRODUCT COMPARISON

3. Casting Valve VS Steel Pipe Valve

note 1. Wall thickness table

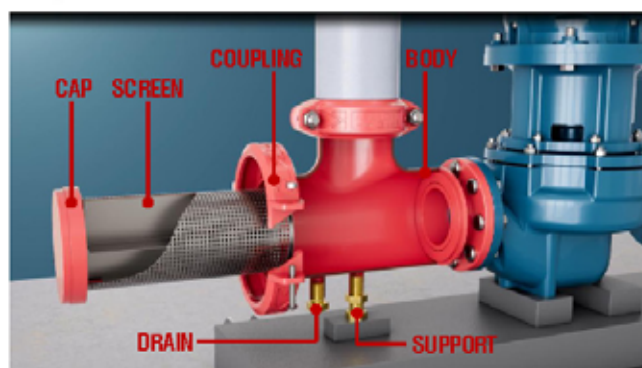
Size	KS B 2361 Cast steel flanged valves 10K (mm)	KS B 2361 Cast steel flanged valves 20K (mm)	KS B 2350 Gray cast iron valves 10K (mm)	KS D 3507 Carbon steel pipes for ordinary piping			KS D 3562 Carbon steel pipes for pressure service		
				SPP (mm)	Cast iron valve %	Cast steel 10K %	SPPS Sch.40 (mm)	Cast iron valve %	Cast steel 10K %
2"	8	9	7	3.65	52	45	3.9	55	43
2.5"	8	10	8	3.65	45	45	5.2	65	52
3"	8	10	9	4.05	45	50	5.5	61	55
4"	9	11	9.5	4.5	47	50	6	63	54
5"	9	12	10.5	4.85	46	53	6.6	62	55
6"	9	13	11	4.85	44	53	7.1	64	54
8"	10	16	14	5.85	41	58	8.2	58	51
10"	14.2	19.1		6.4		45	9.3		48
12"	16	20.6		7		43	10.3		50

* Valve's weight is 30~40% lighter since the wall thickness's difference is 40~50%



PRODUCT FEATURES

1. Suction Diffuser (Structural)



- 1. BODY**
 - Stronger than Cast Iron (Brittleness ↑, Impact ↓)
- 2. SCREEN**
 - Cross plate : stabilizing fluid flow (turbulent flow → laminar flow)
 - Protection from foreign substance.
- 3. CAP**
 - Easy to assemble & disassemble when cleaning (Coupling : Bolts 12" 2EA, 20" 4EA)
 - long life than o-ring (reusable)
- 4. COUPLING & GASKET**
 - Excellent seismic performance
 - Gasket(EPDM) has a longer life than o-ring(NBR)
- 5. DRAIN**
 - Possible to drain by removing drain
- 6. SUPPORT**
 - Adjusting a suction diffuser's height to fit pump

PRODUCT FEATURES

2. 4 in 1 Check Valve (Functional)

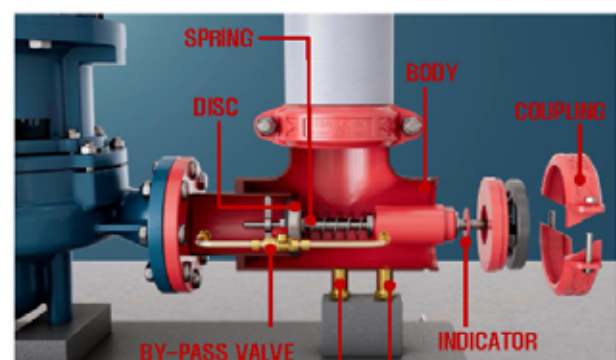
4 in 1 Check Valve : 4 valves into 1 valve

- 1. Check valve function**
 - Protect the pump by preventing backflow when the pump trip
- 2. Shut off valve function**
 - Stop the flow of fluid by using the handle
- 3. Balancing valve function**
 - Control the flowrate by using the indicator
- 4. By-pass valve function**
 - Protect the pump from vacuum or freezing by supplying the water



PRODUCT FEATURES

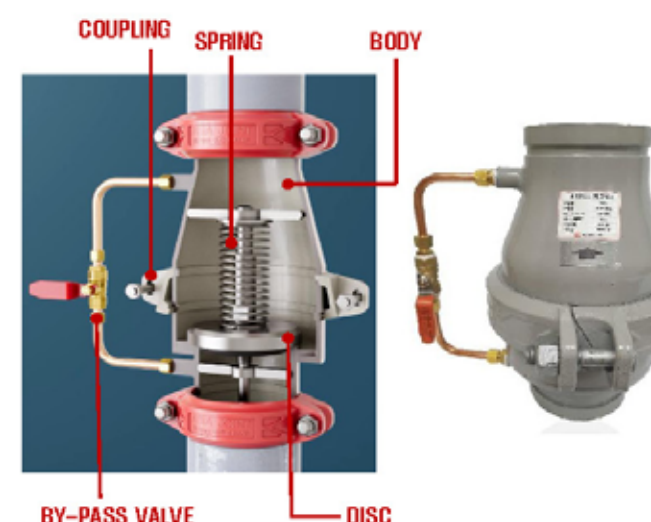
2. 4 in 1 Check Valve (Structural)



- 1. BODY**
 - Stronger than Cast Iron (Brittleness ↑, Impact ↓)
- 2. COUPLING**
 - Easy to disassemble inner parts(trim assembly) (ex. 300A coupling: bolts 2EA / flange: bolts 16EA)
 - long life than o-ring (reusable)
- 3. DRAIN (angle type)**
 - Drain water from a pipe
 - Easy to connect to the drain line
- 4. SUPPORT (angle type)**
 - Adjusting a suction diffuser's height to fit pump
- 5. INDICATOR**
 - Possible to check the stroke & flowrate
- 6. DISC**
 - Excellent sealing, Easy replacement
 - Standard: NBR, 80°C over: EPDM (option)
- 7. SPRING**
 - 304 stainless steel spring (corrosion resistance)
- 8. BY-PASS VALVE**
 - Return water to pump's outlet

PRODUCT FEATURES

3. Hammerless Check Valve (Structural)



- 1. BODY**
 - Stronger than Cast Iron (Brittleness ↑, Impact ↓)
- 2. COUPLING**
 - Easy to disassemble inner parts(trim assembly) (ex. 300A coupling: bolts 2EA / flange: bolts 16EA)
 - long life than o-ring (reusable)
- 3. DISC**
 - Excellent sealing, Easy replacement
 - Standard: NBR, 80°C over: EPDM (order made)
- 4. SPRING**
 - 304 stainless steel spring (corrosion resistance)
- 5. BY-PASS VALVE**
 - Return water to pump's outlet

PRODUCT FEATURES

3. Hammerless Check Valve (Functional)

Three(3) Advantages

1. Check valve function

- Protect the pump by preventing backflow when the pump trip

2. By-pass valve function

- Protect the pump from vacuum or freezing by supplying the water

3. Check valve function

- Excellent seismic performance through the coupling type



BENEFITS

Steel Pipe Valve's Benefits

Jumps to become a valve company that creates future value

■ Technical Aspect

- ▶ To compare the manufacturing period, the casting time of the existing product is more than 40 days and the molding time of the steel pipe valve is only 2 days. Quick delivery relieves user's inconvenience.
- ▶ Light weight, minimized piping load, and excellent price competitiveness
- ▶ Smooth market entry by securing delivery performance

■ Social Aspect

- ▶ Ensuring safety against earthquakes through application of seismic proofed products. In the event of an earthquake, additional problems such as fire and explosion are prevented by securing safety for buildings and firefighting valves.
- ▶ Import substitution effect through applying the steel pipe valve instead of imported valve
- ▶ Job creation by increased demand and environmental pollution reduction by replacing the casting