



# COMPANY OVERVIEW

**KPL** Industry

# *“Highest Quality Valves & Fittings for Special Clients Worldwide”*

**KPL INDUSTRY**, A PREMIER HIGH PRESSURE VALVES AND FITTINGS MANUFACTURERS IN SOUTH KOREA, SERVE THE OIL & GAS, POWER GENERATION, THERMAL & CHEMICAL PROCESSING AND OTHER MISSION-CRITICAL INDUSTRIES IN THE WORLD.

EXTENSIVE CAPABILITY RANGE, EXCEPTIONAL QUALITY AND SUPERB CUSTOMER SERVICE MAKES **KPL INDUSTRY** THE PREMIER VALUE SOLUTION FOR ALL OF YOUR VALVES AND FITTINGS NEEDS.

**KPL INDUSTRY** WILL DO ITS BEST TO PROVIDE OUR VALUED CUSTOMERS WITH THE HIGHEST QUALITY PRODUCTS AT THE INDUSTRY'S MOST COMPETITIVE PRICE LEVEL.

GIVE US AN OPPORTUNITY TO EXCEED YOUR EXPECTATIONS.



## Corporate History

**KPL**  
Industry

### 2017

- JAN 2017 ACQUIRED KC CERTIFICATE

### 2016

- NOV 2016 ACQUIRED APPROVAL FACTORY FROM RINA
- NOV 2016 ACQUIRED PED CERTIFICATE
- NOV 2016 ACQUIRED ISO 14001 CERTIFICATE

### 2015

- SEP 2015 FOUNDED KPL R&D CENTER
- DEC 2015 ESTABLISHED KPL US BRANCH

### 2014

- JAN 2014 ESTABLISHED KPL CHINA BRANCH

### 2013

- DEC 2013 BE AWARDED MEDAL FOR 3MILLION+ DOLLARS EXPORT
- OCT 2013 OBTAINED A CERTIFICATE OF QUALIFIED SUPPLIER ( POSCO E&C )

### 2012

- APR 2012 OBTAINED A CERTIFICATE FOR NUCLEAR QUALIFICATION FROM KEPIC MN

### 2011

- MAR 2011 OBTAINED A CERTIFICATE OF QUALIFIED SUPPLIER ( HYUNDAI )
- MAR 2011 OBTAINED A CERTIFICATE OF REGISTRATION ISO9001 FROM HSB

### 2009

- MAY 2009 EXPORTED FORGED FITTINGS TO JAPAN
- OCT 2009 EXPORTED PLANT ITEMS TO UAE & OMAN

### 2008

- AUG 2008 ESTABLISHED KPL COMPANY



**MERITS & ADVANTAGES**



**KPL**  
**Industry**

**PRODUCTS****PLUG VALVES**

1" x 2" 1502 M x F Standard & H2S  
2" x 2" 1502 M x F , LP Thread Standard & H2S  
3" x 3" 1502 M x F , LP Thread Standard & H2S  
15,000psi working pressure 22,500 psi Tested

**PLUG VALVE REPAIR KIT**

Plug seal, plug, insert, insert o-ring, Adjust Nut

**OTECO STYLE GATE VALVES**

2" to 5" , 2,000psi to 5,000psi WP  
Female Line pipe connection / Union End connection  
/ Butt welded end & Flange end connection

**DEMCO STYLE GATE VALVES.**

2" to 5" 7,500psi WP  
Butt Welded End Connection  
Flanged End Connection

## PRODUCTS



### PUB JOINT

2" & 3" 10,000psi & 15,000psi WP, 1ft to 15ft Length

Integral Type ( 1ft to 10ft length )

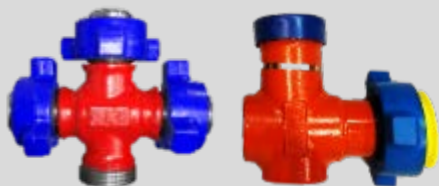
Non pressure Seal Type ( 1ft to 20ft length )



### HOSE LOOP

Designs are available for sour gas services at cold working pressures up to 15,000psi

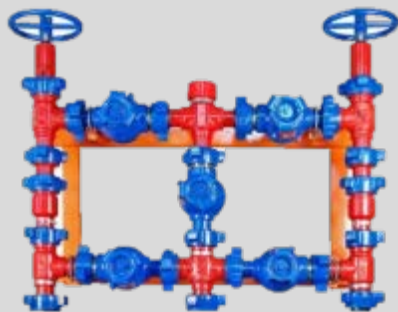
2" & 3" Long Radius Style 50 & Style 10 8ft to 12ft



### INTEGRAL FITTINGS

We provide series of high pressure integral fittings including Tees, Crosses, Elbows

2" to 4" 3,000psi to 20,000psi



### MANIFOLD

5pcs of plug valves & 2 Adjustable choke valves

Available in standard and H2S service

H2S service made per NACE MR-0175

NPT and Autoclave ports are available by customer request

Other combinations are also available by customer request

## PRODUCTS



### CHOKER VALVE

2" to 3" Standard & H2S service

10,000psi to 20,000psi

Repair part can be interchangeable with international brands



### CHOKER PART

Choke Stem, Choke Seat, Choke Bean



### SWIVEL JOINT

2" to 4", 6,000psi to 20,000psi WP

Fig602, Fig1002, Fig 1502 Style 10 to 100



### HAMMER UNION

KPL Hammer unions can be interchanged with products in international market

The model of welding Union : FIG20, FIG60, FIG1002, FIG1502, FIG2002

The model of H2S welding Union : FIG602, FIG1002, FIG1502, FIG2202

## PRODUCTS



### Forged fittings

Construction, Power Plant, Oil Refining,  
Chemical Plant, LPG Pipe Line.

- Maximum Operating Pressure : 9000 lb at 100°F (38°C)
- Operating Temperature Range : 1000°F (537°C)



### Flanges

Various Industrial Site.

- Pipe Size: 1/2 up to 24 inch



### Butt welding fittings

Weld Fittings for various industrial site

- Pipe Size: 1/2 up to 24 inch



### Instrumentation, High pressure and Temperature, Cryogenic service.

- Maximum Operating Pressure : 9000 psig (620 barg) @ 100°F (38°C)
- Operating Temperature Range : -325°F (-198°C) to 1200°F (648°C)
- Size : OD 1/16 - 2 inch, OD 2mm - 38mm



### Integral Bonnet Needle Valve Instrument Isolation, General Service for Test Stand.

- Maximum Operating Pressure: 5000 psig (340 barg) at 100°F (38°C)
- Operating Temperature: -65°F (-54°C) to 450°F (232°C)



# Manufacturing Process

## Raw Material

- Raw Material Check
- Quantity Check
- Visual & Dimension Check



## Material Analyzing

- Chemical Analysis Check
- Preservation of Analysis Certificate



## Material Cutting

- Weight Measuring
- Cut Surface Check
- Marking



## Inspection

- Dimension Test
- Visual Test
- Nondestructive Test



## Heat treatment

- Normalizing
- Tempering
- Q,T
- Solution Treatment



## Heat treatment

- Normalizing
- Tempering
- Q,T
- Solution Treatment



## Forging

- Material Grade Check
- Weight Measuring
- Temperature Control
- Mechanical Test



## Marking

- Description Marking
- Size Marking
- Lot No. Marking



## Undercoating

- Preserve check
- Tectly 506 or etc. Coating



## Packing

- Packing spec. Check
- Packing Inspection



## Shipping

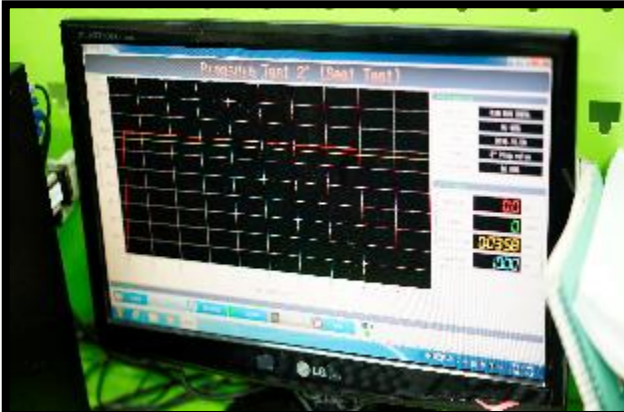
- Dispatching Shipping Documents
- check Cert. of origin



# KPL Production



# KPL Production



# Quality Control & Inspection

## "Raw Material Traceability System Fully Implemented"


The collage illustrates the following components of the traceability system:

- Raw Material:** A stack of steel pipes with green labels for identification.
- Inspection Report (검사성적서):** A detailed report from HAN GLK INDUSTRY HEAT TREATMENT, dated 2018년 3월 25일. It includes material specifications, inspection results, and a hardness table.
- Material Analysis Certificate (分析試料):** A certificate from 한국산업 (Korea Industry) dated 2018년 3월 26일, identifying the material as SCM440.
- Heat Treatment Record (RECORD OF HEAT TREATMENT):** A graph showing temperature (TEMPERATURE) vs. velocity (VELOCITY) for heat treatment. The graph shows a heating phase to 800°C, a holding phase at 800°C, and a cooling phase to 500°C.
- Certification Documents:** Documents from MERTIA STEEL CO., LTD. and J. Takano, including a 'TRUE COPY' certification and a 'WELDED' stamp.

# Quality control & Inspection

## "3rd party inspection available upon customer's request"

DET NORDE VERITAS



**KPL Industry Co., Ltd.**  
 Attn: Mr. Jae-Hwan, Lee  
 #210-6, Sinho-dong  
 Gangseo-gu Pusan 618-290  
 Tel +82 51 831 8451

Our ref: TPKKR16181YD081D27323-I-5347  
 Date: 2012-07-25

**COSCO SHIPYARD GROUP CO. LTD. D.N110, Id. No. D27525**  
 Ball Valve (KPL Industry Co., Ltd.)

Dear Sir,  
 Reference is made to your letter KPLD-120622-01 dated 2012-06-22. The following document is stamped 2012-07-19 and given the status as shown below:

Drawing No.	Rev.	DNV No.	Title	Code	Status
SBV-10M(T)-04G(M)	0	4963	Ball Valve		

Drawing No. SBV-10M(T)-04G(M), "Ball Valve (KPL Industry Co., Ltd.)" is returned unstamped, with the following comment:  
 2396 Please be informed following items are to be shown or included on the drawing for our further evaluation.  
 - Service system  
 - Intended fluid

Please contact Mr. Do-Wook, Kang / Mr. Seung-Ho, Joo in DNV ACEA (Tel. No. 051-611-7172) for any technical discussion on this drawing.

Yours faithfully  
 Yong-Seon Im  
 Station Manager  
 Pusan Station

Hee Youn Doh  
 Contact Person

Enclosure: Drawings

Corporate Headquarters: Det Norske Veritas AS, 1322 Høvik, Norway - www.dnv.com

**ABS Consulting**

Report no: 3304120-01    Project No: 33041209    LC No: 15641-0010020    Report date: 29<sup>th</sup> Jun. 2014    Office: Seoul, Korea



**REPORT OF POSITIVE MATERIAL IDENTIFICATION**  
 합금성분분석보고서

NEW BI-HINIAN INSPECTION TECHNOLOGY CO., LTD.  
 TEL: (051) 313-4850 FAX: (051) 313-4856

Report No: 보고서 번호  
 NSIT-TR-PMI-20130218-1  
 Page No: 페이지 번호  
 1 of 2

Customer(발주처): KPL    Project Name/Po No.(공사명/번호): N/A  
 Item Name /No.(품명/번호): DWG.No(도면번호): N/A  
 Revision: N/A    Operation No.: Procedure No.(Rev.No.)/Code(물자세/코드): NSIT-HDEP-PMI 001 Rev.0 / ASTM B564  
 Material (재료): UR10 H04400 (MOHEL 400)    Type (재료명칭): FLANGES  
 PMI Equipment (검사장비): HITON XRF Analyzer X8-B18(21937)    Examination Scope (검사 범위): Base Metal ( ) Deposit Metal ( )  
 Material Specification (Base Metal):    Material Specification (Deposit Metal):  
 C: min 63%, Cu: 28.0-34.0%, Fe: max 2.5% Mn: max 2.0%

No.	Description(Lot No)	Base Metal					Result (Accept / Reject)	Reading No
		Cu	Ni	Fe	Mn	Si		
1	300LBS LWN RF 3" L268mm	31.66	63.77	2.30	0.79		Accept	
2	300LBS LWN RF 3" L268mm	31.28	64.23	2.17	0.70		Accept	
3	300LBS LWN RF 3" L268mm	31.67	64.10	2.47	0.74		Accept	
4	300LBS LWN RF 3" L268mm	31.67	64.10	2.16	0.67		Accept	
5	300LBS LWN RF 3" L268mm	31.46	64.41	2.25	0.67		Accept	

GL  
 Germanischer Lloyd  
 Industrial Service Korea Ltd., Co.

GL-Order No.:    Inspection Report  
 No. IR-90-PV-263-PI-163-KPL-01 Rev.0

This is to certify that the components as described hereunder have been inspected.

Client: TASHA Manufacturing Co. Iran  
 Client's P.O. No./Contract No.: 90-PV-263-PI-163 & 90-FL-252309-PI-171  
 Project: PV-263 / FL-252309  
 Supplier: KPL  
 Manufacturer: KPL  
 Place of Inspection: Busan, Korea  
 Date/Period of Inspection: 15 May 2011

The following material was inspected:

Item No.	Description	PO Tube Qty	Inspected Qty this time	Total Qty Inspected till date	Balanced Qty
	See item list on next page				

1.0 Reason for visit  
 Inspector carried out the inspection as per the requirement of Inspection Order (Ref no. FP-90-S-0034) dated on 04 Apr 2012.

2.0 Inspection Documents:  
 Inspection Assignment No. dated  
 Purchase Order No. 90-FL-309258-PI-163 & PO NO. 90-PV-196-PI-171 Rev1 dated 07/Mar/2012  
 GL Scope of Inspection: dated  
 General Requirement Note: dated  
 ITP Plan No. dated  
 Drawing No. dated

3.0 Details of inspection performed (Use separate page if more detail is required)

3.1 Personnel Contacted  
 Name: James Lee    Company: KPL    Function: President  
 Name: Yun-Ho, Lee    Company: GL    Function: Inspector

**KPL Industry**    HYDRAULIC LEAKAGE TEST REPORT

Cert No.: KPLQM-CIR-T10-0702-001    Test Date: 2012.07.02

Customer	Cosco Dalian Shipyards	Holding Time	3 Min
Ship Yard	Cosco Dalian Shipyards	Class of Fluid	Oil
Hull No.	N110	Item Name	Ball Valve

**PARTICULARS**

NO	DESCRIPTION	MATERIAL	NOMINAL DIAMETER	WORKING PRESSURE (BAR)	TEST PRESSURE (BAR)	QTY (PCS)	SPEC (NO LEAK)
1	Seat Leakage	SUS316	0.010mm-1/4"ODRP	69	80	386	NO LEAK
2	Body Leakage	SUS316	0.010mm-1/4"ODRP	69	120	386	NO LEAK



Remarks  
 Gauge Cert No.: C12378-1563  
 Serial No.: P120629-1  
 Calibration valid until: 2013.06.29

We are endeavoring to supply quality sophisticated product depending on customer need through test such as preceding descriptions

Inspected By	Checked By	Approved by	Witness by	Reviewed by
J.o.kim	S.S.kim	J.H.lee		

KPL INDUSTRY CO.,LTD

GL-Order No.:    Inspection Report  
 No. IR-90-PV-263-PI-163-KPL-01 Rev.0

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Client: TASHA Manufacturing Co. Iran  
 Client's P.O. No./Contract No.: 90-PV-263-PI-163 & 90-FL-252309-PI-171  
 Project: PV-263 / FL-252309  
 Supplier: KPL  
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3.1 Personnel Contacted  
 Name: James Lee    Company: KPL    Function: President  
 Name: Yun-Ho, Lee    Company: GL    Function: Inspector

Managing Director: Hee-Tae Park    Business Registration No.: 113-81-03382  
 Representative: Yong-Seon Im    Registered Office: Seoul, Korea, 11013-0164007    Form 1.5  
 Place of performance and jurisdiction in Seoul, Korea. The latest edition of the General Terms and Conditions is applicable. Korean law applies.    2007-01-10

# Quality control & Inspection

“100% hydraulic testing performed prior to shipment”



# Quality control & Inspection

## TEST EQUIPMENTS



# Certificates





# Research and Development

“Continue developing new product offerings with renowned local R&D institutions”

**KPL Industry**



### Flow Characteristics and Structural Safety Assessment According to Pressure Changes in Mud Gate Valves for Land Drilling

Geun-Ho Lee

### Contents

- I. Introduction
- II. Numerical Analysis
- III. Numerical Analysis Results
- IV. Conclusions

### I. Introduction

#### 1. Research Background

Max Gate Valve

In this study, a flow domain and a flow domain model were established for creating a 3D model of a max gate valve and gate valve based on a flow characteristic analysis. The characteristics and pressure distribution were analyzed to set the results. Also, the results of the flow characteristics analysis were applied to a flow structure coupled analysis. Therefore, the flow characteristics and the structural safety of the max gate valve of the max gate valve were observed, and the structural safety of the valve was assessed.

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### II. Numerical Analysis

#### 1. Finite Element Model

3D model and gate gap parameter

Gate Gap	Value
36 mm	
31 mm	
23 mm	
15 mm	
7 mm	

### II. Numerical Analysis

#### 2. Flow Analysis

Boundary condition	
Fluid	Water
Turbulent model	k-ε, SST
Inlet condition	7500 psi
Outlet condition	Relative pressure

### IV. Results of Numerical Analysis

#### 1. Flow analysis result

Maximum stress generated according to the flow analysis results

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### IV. Results of Numerical Analysis

#### 2. Flow-structure coupled analysis result

(a) Stress generated at each gate gap (b) Deformation rate at each gate gap

### V. Conclusion

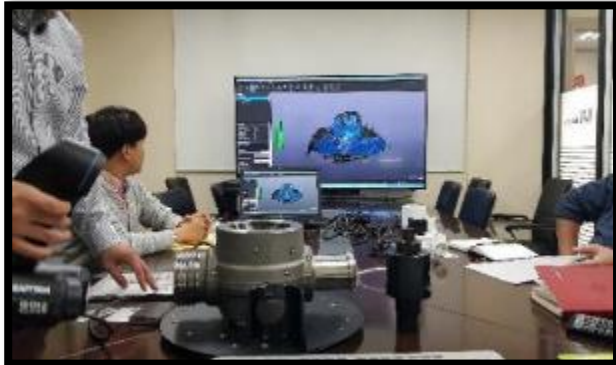
This study investigated the flow characteristics and assessed the structural safety of max gate valves for land drilling, and the results were as follows.

- The study of the flow characteristics showed that the highest flow velocity was observed in the largest gate gap of 36 mm, and the fluid pressure decreased as the gate gap decreased.
- The flow-structure coupled analysis results showed that the generated stress and deformation rate inside the valve increased as the gate gap decreased.
- The flow-structure coupled analysis results showed that the maximum stress was 411.05 MPa and the maximum deformation rate was 0.019 mm for the smallest gate gap of 7 mm, which was lower than the allowable stress of 770 MPa for valve materials according to API 4MB and ASTM A407 standards. Thus, it was determined that the valve was structurally safe.
- This study was based on a valve of one particular size. Therefore, further studies on max gate valves of different sizes are required.

### Reference

Reference

- 1. J. H. Park, (2010), Stress Analysis of Max Gate Valve, Journal of the Korean Society for Steel System Engineering, 15(3), 9-14.
- 2. J. H. Park, S. C. Park, S. H. Kim, S. C. Jung, J. H. Lee, H. S. Lee (2010), Development of High Pressure Gate Valve for Offshore, The Korean Society of Mechanical Engineers, 21(4), 206-210.
- 3. S. H. Park, S. C. Park, S. C. Lee, H. S. Kim, H. S. Lee, J. H. Lee (2010), A Study on the Structural Safety Analysis of High Pressure Gate Valve for Offshore through the Finite Element Method, International Journal of the Korean Society for Steel System Engineering, 15(3), 25-30.
- 4. S. H. Park, S. C. Park, S. H. Kim, S. C. Jung, J. H. Lee, H. S. Lee (2010), A Study on the Structural Safety Analysis of High Pressure Gate Valve for Offshore through the Finite Element Method, International Journal of the Korean Society for Steel System Engineering, 15(3), 25-30.
- 5. S. H. Park, S. C. Park, S. H. Kim, S. C. Jung, J. H. Lee, H. S. Lee (2010), A Study on the Structural Safety Analysis of High Pressure Gate Valve for Offshore through the Finite Element Method, International Journal of the Korean Society for Steel System Engineering, 15(3), 25-30.



# Research and Development

## 3D Modeling & Numerical analysis

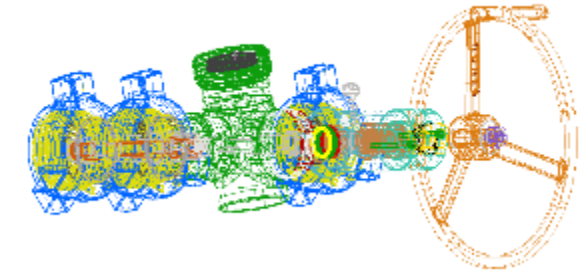
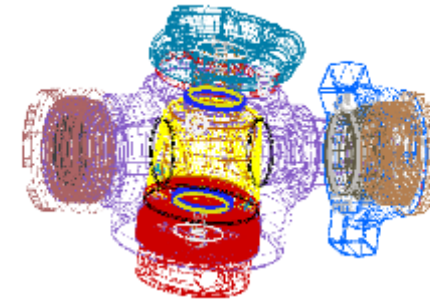
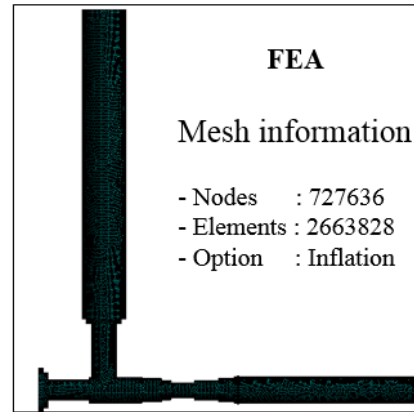
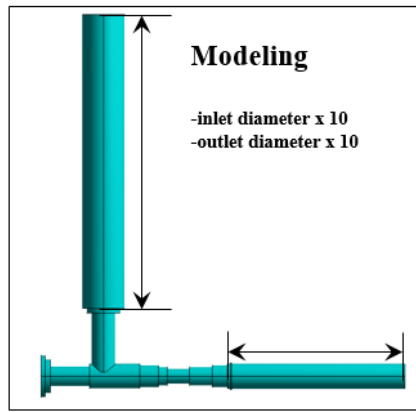
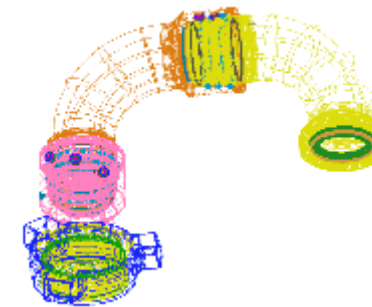
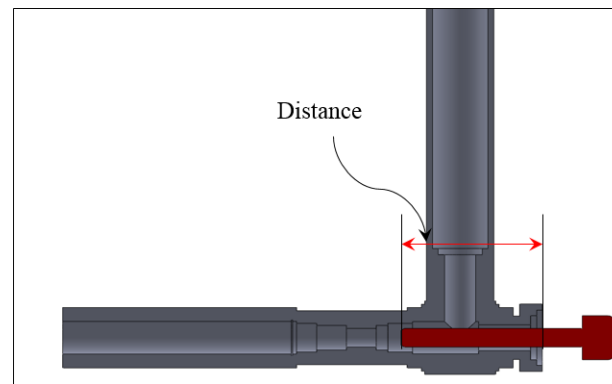
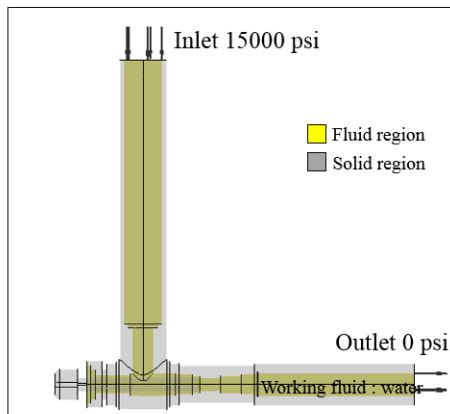


figure-1) Modeling and FEA model

### Boundary conditions and variable

✓ This simulation was carried out in following conditions



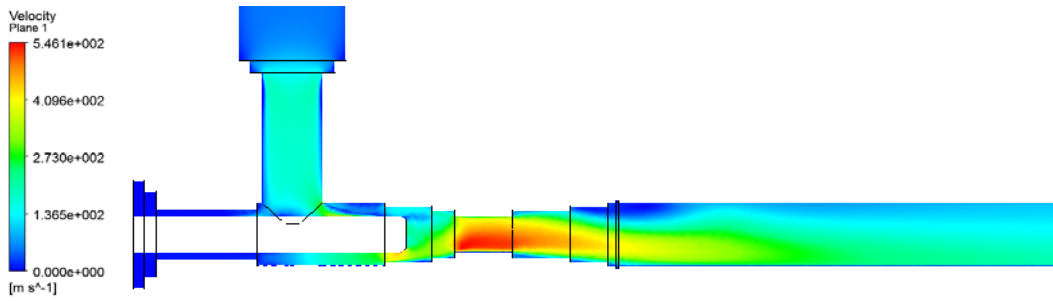
(a) Boundary conditions

(b) variable

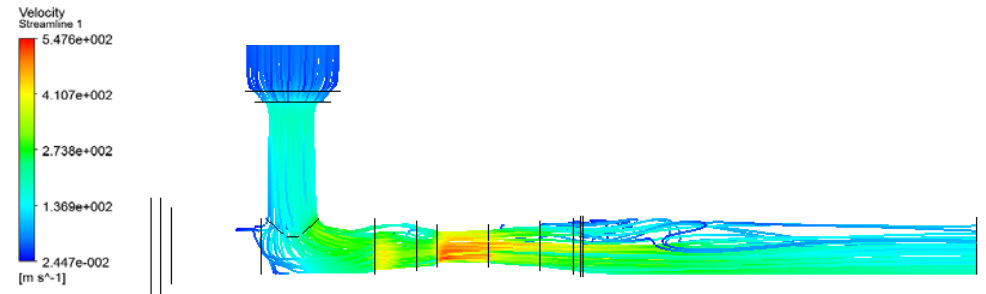
Figure-2 Boundary conditions and variable

# Fluid Analysis

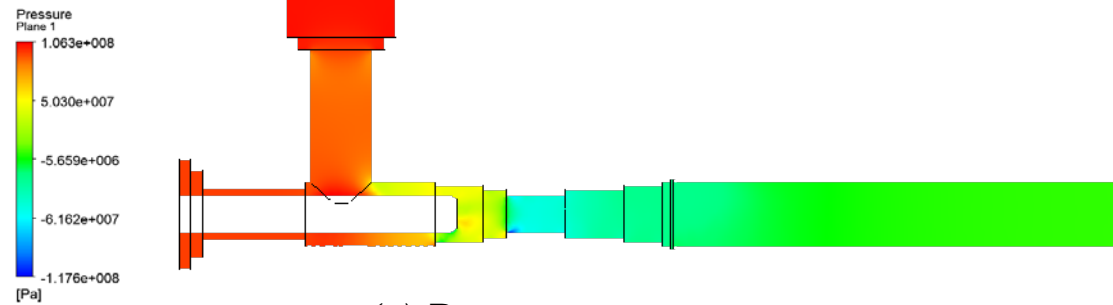
Results ✓ Case2



(a) *Velocity contour*



(b) *Streamline*

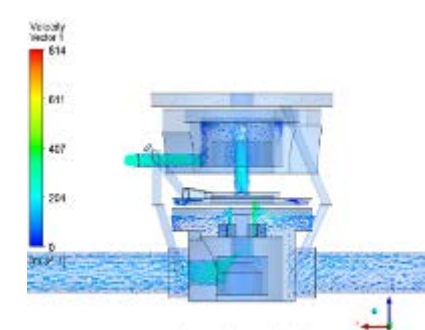
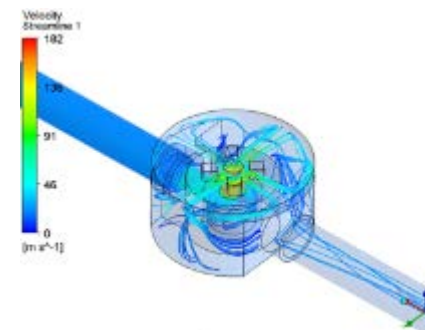
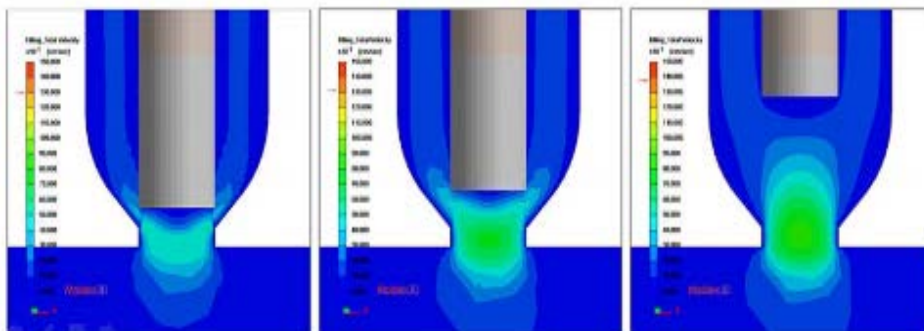
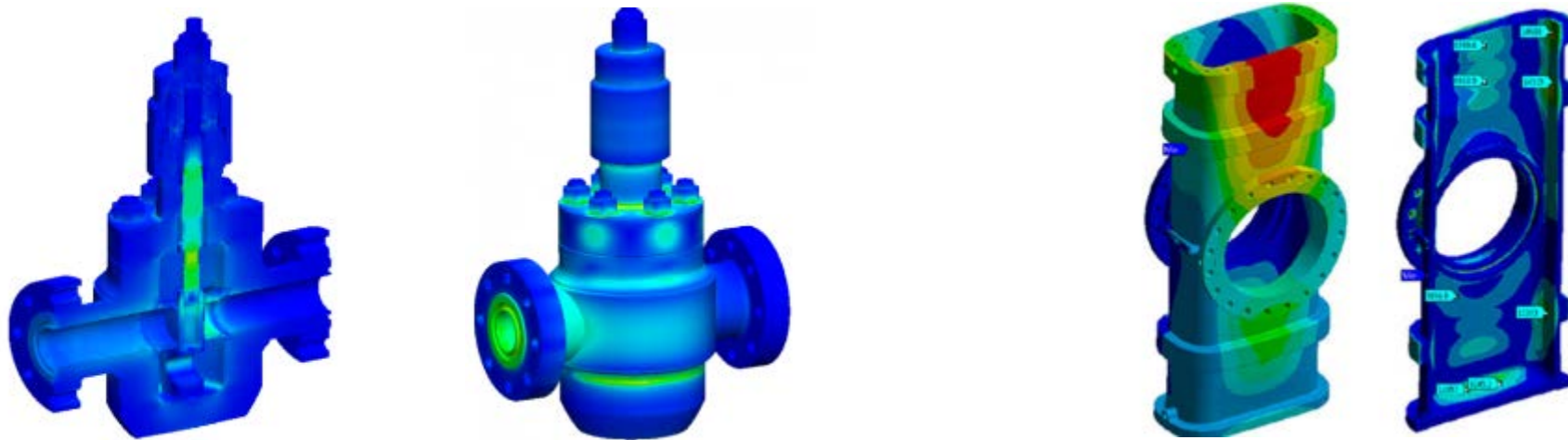


(c) *Pressure contour*

Figure-4 Simulation results

# Fluid Analysis

Results ✓ Case3

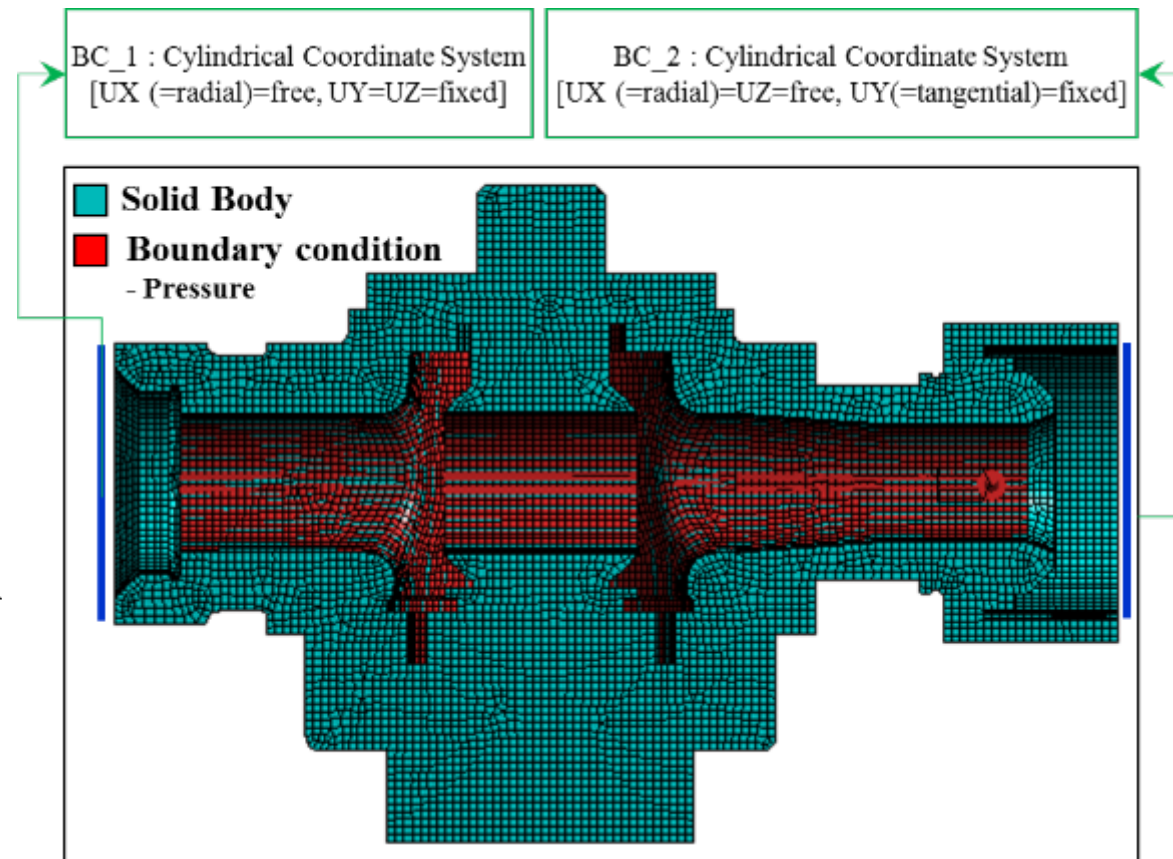


# Fluid Analysis

Results ✓ Case4

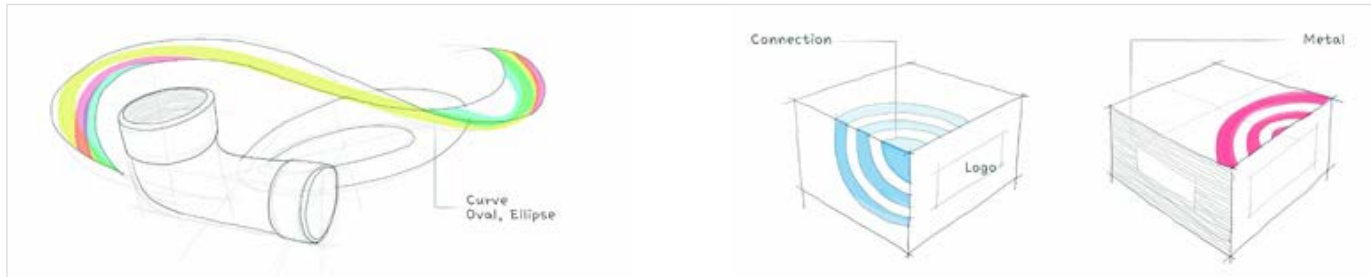
Thickness	Distribution of stress	Distribution of safety factor
13.80 mm		
11.12 mm		

Fig.6.1 Computed Temperature Distribution at CASE-A



# Packaging

“We pack our products in safe packaging and elegant designs.”



Main concept : Metal



Main concept : Connection



## Contact

**"If you have any inquiries do not hesitate to contact us."**



*Valves & Fitting*

*KPL will do the best for the leading company of fitting industries with high technique and products.*

### Head office & Factory

Address : 210-6ShinhoDong,GangSeo-gu Busan, SouthKorea

Tel : +82-51-831-8451

Fax : +82-51-831-8452

E-mail : jameslee@kplfitting.com

Web URL : www.kplfitting.com

### USA Sales Office

766 Rosarita Dr. Fullerton, CA 92835

Tel : 949.682.1157

M.P. 949.751.7469

E-mail : us\_sales@kplfitting.com

**KPL**  
Industry

KPL WILL DO THE BEST FOR THE LEADING COMPANY OF FITTING INDUSTRIES WITH HIGH TECHNIQUE AND PRODUCTS.



**THANK  
YOU**

**KPL Industry**

[WWW.KPLFITTING.COM](http://WWW.KPLFITTING.COM)