

Summary of Test Results

Reference no. : BC-SUMMARY-2022-122

Customer : Gate Way Valve & Fitting Ltd.  
Address : Flat A1, 4/F., Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, H. K.  
Sample description : Cast Iron Pressure Reducing Valve  
Nominal pressure (PN) : 16  
Manufacturer : Yoshitake Work (Thailand) Ltd.  
Brand name : Yoshitake  
Body marking : (DN)  
Model no. : GD-200HS  
Origin : Thailand  
Sample submitted by : Gate Way Valve & Fitting Ltd.  
Test standard : BS EN 1567 : 1999 / WIS 4-52-01 Dec. 1992 : Issue 1 / BS EN 1561 : 2011 / BS EN 10088-1 : 2014 / BS EN 10088-3 : 2014  
Test period : 27 September to 14 October 2022

A) Sample List

DN (mm)	Specimen no.
65	220922-2128-001
80	220922-2128-002
100	220922-2128-003
150	220922-2128-004

B) Test Item

1) Dimensions Check (BS EN 1567 : 1999 Clause 4)

DN (mm)	Test results	Castco LRN
65	Passed	220922-2128
80	Passed	
100	Passed	
150	Passed	

2) Coating Thickness Test (WIS 4-52-01 Dec. 1992 : Issue 1 Appendix B)

DN (mm)	Test results	Castco LRN
65	Passed	220922-2128
80	Passed	
100	Passed	
150	Passed	

3) Pressure Strength and Tightness of the Body (BS EN 1567 : 1999 Clause 8.2.2)

DN (mm)	Test results	Castco LRN
65	Passed	220922-2128
80	Passed	
100	Passed	
150	Passed	

Summary of Test Results

Reference no. : BC-SUMMARY-2022-122

B) Test Item (con't)

4) Flow Rate and Outlet Pressure (BS EN 1567 : 1999 Clause 8.3.4)

DN (mm)	Test results	Castco LRN
65	Passed	220922-2128
80	Passed	
100	Passed	
150	Passed	

5) Tensile Test (BS EN 1561 : 2011 Clause 7.2.1 Table 1 (Grade EN-GJL-250) and Clause 9.1)

DN (mm)	Test results	Castco LRN
65	Passed	220922-2128
80	Passed	
150	Passed	

6) Chemical Composition (Seat) (BS EN 10088-1 : 2014 Table 2 Grade 1.4401 (316))

DN (mm)	Test results	Castco LRN
65	Passed	221005-2121
80	Passed	221005-2123
150	Passed	221005-2125

7) Chemical Composition (Stem) (BS EN 10088-3 : 2014 Table 2 Grade 1.4401 (316))

DN (mm)	Test results	Castco LRN
65	Passed	221005-2122
80	Passed	221005-2124
150	Passed	221005-2126

Prepare by : \_\_\_\_\_  
Date : 26 October 2022

**FU HO MAN**  
Assistant Technical Manager

Review by : \_\_\_\_\_  
Date : 26 October 2022

**WONG KA MAN**  
Senior Manager



Test Report  
Pressure Reducing Valves - Dimensions Check  
(BS EN 1567 : 1999 Clause 4)

Date of issue : 26 October 2022

Page 1 of 7 page(s)

Castco LRN : 220922-2128

**Details as supplied by customer**

Customer : Gate Way Valve & Fitting Ltd.

Customer's ref. no. : - -

Address : Flat A1, 4/F., Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, H. K.

Contract no. : - -


Job title : - -

Sample description : Cast Iron Pressure Reducing Valve

Nominal pressure (PN) : 16

Manufacturer : Yoshitake Work (Thailand) Ltd.

Brand name : Yoshitake

Body marking :  (DN)

Model no. : GD-200HS

Origin : Thailand

Sample submitted by : Gate Way Valve & Fitting Ltd.

**Laboratory test results**

Date of sample received : 21 September 2022

Date of test : 27 September 2022

Specimen no.		220922-2128-001	220922-2128-002	220922-2128-003	220922-2128-004
DN (mm)		65	80	100	150
Dimension of End Connection (mm)	Measured mean value	65.40	79.70	100.32	149.60
	BS EN 1092-2 : 1997 Table 9 requirement	65	80	100	150
Outside diameter of flange (mm)	Measured mean value	187	205	225	289
	BS EN 1092-2 : 1997 Table 9 requirement	185	200	220	285
Diameter of bolt circle (mm)	Measured mean value	145	160	180	240
	BS EN 1092-2 : 1997 Table 9 requirement	145	160	180	240
Diameter of bolt hole & Bolts number (mm & no.)	Measured mean value	17.59 & 4	17.48 & 8	17.59 & 8	21.77 & 8
	Manufacturer requirement	17 to 18 & 4	17 to 18 & 4	17 to 18 & 8	21 to 22 & 8
Flange thickness (mm)	Measured mean value	21.08	21.64	22.16	25.72
	BS EN 1092-2 : 1997 Table 9 requirement	19 to 26	19 to 26	20 to 27	23 to 30

Remark(s) :

1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS EN 1567 : 1999 Table 1 (effect of measurement uncertainty has not been taken into account).
3. Test results of sample comply with the requirement of BS EN 1092-2 : 1997 Table 9 (effect of measurement uncertainty has not been taken into account).

Checked by :

  
**FU HO MAN**  
Assistant Technical Manager

Certified by :

  
**WONG KA MAN**  
Senior Manager

Form no. : BC\_PRIV\_DIM\_BSEN1567\_1999\_T dd 23/08/2021

## Test Report

## Valves - Coating Thickness Measurement

(WIS 4-52-01 Dec. 1992 : Issue 1 Appendix B in conjunction with the following specification(s) : WIS 4-52-01 Dec. 1992 : Issue 1 Cl. 12.7.1)

Date of issue : 26 October 2022

Page 2 of 7 page(s)

Castco LRN : 220922-2128

Details as supplied by customer

Customer : Gate Way Valve &amp; Fitting Ltd.

Customer's ref. no. : - -

Address : Flat A1, 4/F., Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, H. K.

Contract no. : - -


Job title : - -

Sample description : Cast Iron Pressure Reducing Valve

Nominal pressure (PN) : 16

Manufacturer : Yoshitake Work (Thailand) Ltd.

Brand name : Yoshitake

Body marking :  (DN)

Model no. : GD-200HS

Origin : Thailand

Sample submitted by : Gate Way Valve &amp; Fitting Ltd.

Laboratory test results

Date of sample received : 21 September 2022

Date of test : 27 September 2022

Specimen no.	220922-2128-001	220922-2128-002	220922-2128-003	220922-2128-004
DN (mm)	65	80	100	150
Ambient temperature (°C)	25.0	25.0	25.0	25.0
Measured value of coating thickness at external surface (µm)	1	223	159	134
	2	253	135	106
	3	242	138	108
	4	204	116	121
	5	246	110	111
Measured value of coating thickness at internal surface (µm)	6	358	122	140
	7	212	102	125
	8	378	103	126
	9	371	160	116
	10	273	133	141
	11	236	111	138
	12	280	119	153
	13	299	126	137
	14	229	110	206
	15	246	131	154
Mean	270.0	125.0	134.4	129.3
Minimum coating thickness (µm)	204	102	106	107
Maximum coating thickness (µm)	378	160	206	166
Standard deviation (µm)	57.0	18.0	24.9	21.2
Manufacturer requirement (µm)	Minimum coating thickness	min. 100		
	Maximum coating thickness	max. 1000		

Remark(s) :

1. Test results relate only to the specimen tested.

Checked by :

  
**FU HO MAN**  
Assistant Technical Manager

Approved Signatory :

  
**WONG KA MAN**  
Senior Manager



Test Report  
Pressure Reducing Valves - Pressure Strength and Tightness Test  
(BS EN 1567 : 1999 Clause 8.2.2)

Date of issue : 26 October 2022

Page 3 of 7 page(s)

Castco LRN : 220922-2128

Details as supplied by customer

Customer : Gate Way Valve & Fitting Ltd.

Customer's ref. no. : - -

Address : Flat A1, 4/F., Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, H. K.

Contract no. : - -


Job title : - -

Sample description : Cast Iron Pressure Reducing Valve

Nominal pressure (PN) : 16

Manufacturer : Yoshitake Work (Thailand) Ltd.

Brand name : Yoshitake

Body marking :  (DN)

Model no. : GD-200HS

Origin : Thailand

Sample submitted by : Gate Way Valve & Fitting Ltd.

Laboratory test results

Date of sample received : 21 September 2022

Date of test : 27 September 2022

Specimen no.	220922-2128-001	220922-2128-002	220922-2128-003	220922-2128-004
DN (mm)	65	80	100	150
Apply pressure (bar)	to inlet connection	25	25	25
	to outlet connection	16	16	16
Maintain period (min)	10	10	10	10
Observation	No leakage was observed	No leakage was observed	No leakage was observed	No leakage was observed
Requirement	No leakage or permanent deformation shall occur			

Remark(s) :

1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS EN 1567 : 1999 Clause 8.2.2 (effect of measurement uncertainty has not been taken into account).

Checked by :  **FU HO MAN**  
Assistant Technical Manager

Certified by :  **WONG KA MAN**  
Senior Manager

Test Report  
Pressure Reducing Valves - Flow Rate and Outlet Pressure Test  
(BS EN 1567 : 1999 Clause 8.3.4)

Date of issue : 26 October 2022

Page 4 of 7 page(s)

Castco LRN : 220922-2128

Details as supplied by customer

Customer : Gate Way Valve & Fitting Ltd.

Customer's ref. no. : - -

Address : Flat A1, 4/F., Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, H. K.

Contract no. : - -

Job title : - -

Sample description : Cast Iron Pressure Reducing Valve

Nominal pressure (PN) : 16

Manufacturer : Yoshitake Work (Thailand) Ltd.

Brand name : Yoshitake

Body marking : (DN)

Model no. : GD-200HS

Origin : Thailand

Sample submitted by : Gate Way Valve & Fitting Ltd.

Laboratory test results

Date of sample received : 21 September 2022

Date of test : 27 to 28 September 2022

Specimen no.	220922-2128-001	220922-2128-002	220922-2128-003	220922-2128-004
DN (mm)	65	80	100	150
Nominal flow rate (QN) (L/s)	6.67	10	15.56	15.56
Measured outlet pressure (bar)	Inlet pressure	8	8	8
	Outlet pressure	2.9	2.8	2.7
	Inlet pressure	6	6	6
	Outlet pressure	2.6	2.6	2.5
	Inlet pressure	16	16	16
	Outlet pressure	3.1	3.0	3.0
Requirement	The outlet pressure shall be within 2.2 to 3.8 bar			

Remark(s) :

1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS EN 1567 : 1999 Clause 8.3.4 (effect of measurement uncertainty has not been taken into account).
3. Due to the Nominal flow rate (QN) of DN150 did not specified on BS EN 1567 : 1999 Table 5, the test method and requirement just based on DN100.

Checked by : **FU HO MAN**  
Assistant Technical Manager

Certified by : **WONG KA MAN**  
Senior Manager

**Test Report**  
**Metallic Materials - Tensile Test of Metallic Materials**  
**(BS EN ISO 6892-1 : 2009)**

Date of issue : 26 October 2022

Page 5 of 7 page(s)

Castco LRN : 220922-2128

**Details as supplied by customer**

Customer : Gate Way Valve &amp; Fitting Ltd.

Customer's ref. no. : - -

Address : Flat A1, 4/F., Galaxy Factory Building, 25-27 Luk Hop Street, San Po Kong, Kowloon, H. K.

Contract no. : - -

Job title : - -

Sample description : Cast Iron Pressure Reducing Valve

Nominal pressure (PN) : 16

Manufacturer : Yoshitake Work (Thailand) Ltd.

Brand name : Yoshitake

Body marking :  (DN)

Model no. : GD-200HS

Origin : Thailand

Sample submitted by : Gate Way Valve &amp; Fitting Ltd.

Acceptance standard : BS EN 1561 : 2011 Clause 7.2.1 Table 1 (Grade EN-GJL-250) and Clause 9.1

**Laboratory test results**

Date of sample received : 21 September 2022

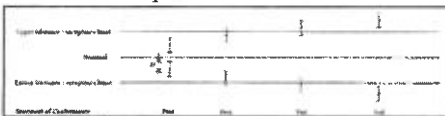
Date of test : 03 October 2022

**Tensile Test**

Specimen no.	DN (mm)	Type & Prepar'n	Specimen length (mm)	Area (mm <sup>2</sup> )	Yield strength (MPa)	Tensile strength (MPa)	Elongation (%)	Position of fracture	Remark
220922-2128-001	65	A, M	250	321.7	--	262	--	Valid	--
220922-2128-002	80	A, M	250	322.4	--	258	--	Valid	--
220922-2128-004	150	A, M	250	322.4	--	263	--	Valid	--

**Remark(s) :**


- A - Proportional; B - Non - proportional; M - Machined; N - Unmachined;  
+ - This measurement is 'invalid' which relates to the position of fracture only.
- Test results relate only to the specimen tested.
- Test results of sample comply with the requirement of BS EN 1561 : 2011 Table 1 (this specification is not covered by the laboratory's HOKLAS accreditation).
- The requirement of BS EN 1561 : 2011 Table 1 : Tensile strength = min. 250MPa.
- The acceptance limit is the same as the tolerance limit (simple acceptance, see Figure A). Only test results out of the tolerance/acceptance limit will be concluded as out-of-tolerance.



Checked by :

  
**FU HO MAN**  
Assistant Technical Manager

Approved Signatory :

  
**WONG KA MAN**  
Senior Manager

Test Report  
Pressure Reducing Valves - Dimensions Check  
(BS EN 1567 : 1999 Clause 4)

Date of issue : 26 October 2022

Page 6 of 7 page(s)

Castco LRN : 220922-2128

Appendix A220922-2128-001(1)220922-2128-001(2)220922-2128-002(1)220922-2128-002(2)220922-2128-003(1)220922-2128-003(2)



Test Report  
Pressure Reducing Valves - Dimensions Check  
(BS EN 1567 : 1999 Clause 4)

Date of issue : 26 October 2022

Page 7 of 7 page(s)

Castco LRN : 220922-2128

Appendix A220922-2128-004(1)220922-2128-004(2)

End of Report

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Page 1 of 2

Specimen No.: CHEM-221005-2121-001

Castco LRN: 221005-2121

**Details as supplied by customer**

Name of Customer : Gate Way Valve & Fitting Limited

Address : Flat A1, 4/F, Galaxy Fty Bldg, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong

Job Title : --

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN65 Cast Iron Pressure Reducing Valve (Seat)

Specification : BS EN 10088-1:2014, Table 2, Grade 1.4401 (316)

Specimen No. : 220922-2128-001

Sample Identification No. : -- / Model No. : GD-200HS / Origin : Thailand

Manufacturer : Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake

**Test Method(s):-**

- 1) BS EN ISO 15350 : 2010
- 2) ST-Multi-1(ICP-OES)
- 3) BS EN ISO 15351: 2010

**Remark(s):**

I. Test results only relate to the specimen tested.

Checked by :

**Lau Hiu Yat**  
Assistant Technical Manager

Approved Signatory :

**Cheng Chi Fai**  
Senior Manager

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2121-001

Page 2 of 2

Castco LRN: 221005-2121

**Laboratory test details**

Date of Request Confirmed: 05-10-2022

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Chemical Analysis		Result
1) Total Carbon Content	C %	0.051
1) Total Sulfur Content	S %	0.021
2) Chromium	Cr %	17.69
2) Manganese	Mn %	1.49
2) Molybdenum	Mo %	2.25
2) Nickel	Ni %	10.35
2) Phosphorus	P %	0.032
2) Silicon	Si %	0.281
3) Nitrogen	N %	0.048

**End of Report**

Form No.: CHM Steel-1 T dd 16/12/2015

## Appendix A

### Summary of Chemical Analysis of Steel

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2121-001

Page 1 of 1

Castco LRN: 221005-2121

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: --

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Castco LRN:	221005-2121				
Sample Description :	DN65 Cast Iron Pressure Reducing Valve (Seat)				
Specimen No. :	220922-2128-001				
Sample Identification No.:	-- / Model No. : GD-200HS / Origin : Thailand				
Manufacturer :	Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake				
Specification: BS EN 10088-1:2014, Table 2, Grade 1.4401 (316)			Test Results	Within / Exceed limit	
Carbon	C	0.07 max.	%	0.051	Within limit
Sulfur	S	0.030 max. <sup>(III)</sup>	%	0.021	Within limit
Chromium	Cr	16.5 to 18.5	%	17.69	Within limit
Manganese	Mn	2.00 max.	%	1.49	Within limit
Molybdenum	Mo	2.00 to 2.50	%	2.25	Within limit
Nickel	Ni	10.0 to 13.0	%	10.35	Within limit
Phosphorus	P	0.045 max.	%	0.032	Within limit
Silicon	Si	1.00 max.	%	0.281	Within limit
Nitrogen	N	0.10 max.	%	0.048	Within limit

#### Remark(s):

- I. Test results only relate to the specimen tested.
- II. Test results of the specimen are in compliance with the chemical requirements of BS EN 10088-1:2014, Table 2, Grade 1.4401 (316).
- III. For bars, rods, wire, sections, bright products and the relevant semi-finished products, a maximum content of 0.030 % S applies. Particular ranges of sulfur content may provide improvement of particular properties. For machinability a controlled sulfur content of 0.015 % to 0.030 % is recommended and permitted. For weldability, a controlled sulfur content of 0.008 % to 0.030 % is recommended and permitted. For polishability, a controlled sulfur content of 0.015 % max. is recommended.

**Test Report****Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2122-001

Page 1 of 2

Castco LRN: 221005-2122

**Details as supplied by customer**

Name of Customer : Gate Way Valve & Fitting Limited

Address : Flat A1, 4/F, Galaxy Fty Bldg, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong

Job Title : --

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN65 Cast Iron Pressure Reducing Valve (Stem)

Specification : BS EN 10088-3:2014, Table 2, Grade 1.4401 (316)

Specimen No. : 220922-2128-001

Sample Identification No. : -- / Model No. : GD-200HS / Origin : Thailand

Manufacturer : Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake

**Test Method(s):-**

- 1) BS EN ISO 15350 : 2010
- 2) ST-Multi-1(ICP-OES)
- 3) BS EN ISO 15351: 2010

**Remark(s):**

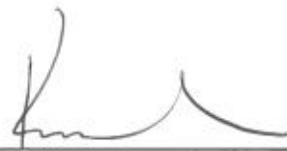
I. Test results only relate to the specimen tested.

Checked by :

  
Lau Hiu Yat

Assistant Technical Manager

Approved Signatory :

  
Cheng Chi Fai

Senior Manager

**Test Report  
Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2122-001

Page 2 of 2

Castco LRN: 221005-2122

**Laboratory test details**

Date of Request Confirmed: 05-10-2022

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Chemical Analysis		Result
<sup>1)</sup> Total Carbon Content	C %	0.052
<sup>1)</sup> Total Sulfur Content	S %	0.024
<sup>2)</sup> Chromium	Cr %	17.35
<sup>2)</sup> Manganese	Mn %	1.45
<sup>2)</sup> Molybdenum	Mo %	2.18
<sup>2)</sup> Nickel	Ni %	10.14
<sup>2)</sup> Phosphorus	P %	0.033
<sup>2)</sup> Silicon	Si %	0.284
<sup>3)</sup> Nitrogen	N %	0.048

**End of Report**

Form No.: CHM Steel-1 T dd 16/12/2015

## Appendix A

## Summary of Chemical Analysis of Steel

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2122-001

Page 1 of 1

Castco LRN: 221005-2122

Name of Customer: Gate Way Valve &amp; Fitting Limited

Job Title: --

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Castco LRN:	221005-2122				
Sample Description :	DN65 Cast Iron Pressure Reducing Valve (Stem)				
Specimen No. :	220922-2128-001				
Sample Identification No.:	-- / Model No. : GD-200HS / Origin : Thailand				
Manufacturer :	Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake				
Specification: BS EN 10088-3:2014, Table 2, Grade 1.4401 (316)			Test Results	Within / Exceed limit	
Carbon	C	0.07 max.	%	0.052	Within limit
Sulfur	S	0.030 max.	%	0.024	Within limit
Chromium	Cr	16.5 to 18.5	%	17.35	Within limit
Manganese	Mn	2.00 max.	%	1.45	Within limit
Molybdenum	Mo	2.00 to 2.50	%	2.18	Within limit
Nickel	Ni	10.0 to 13.0	%	10.14	Within limit
Phosphorus	P	0.045 max.	%	0.033	Within limit
Silicon	Si	1.00 max.	%	0.284	Within limit
Nitrogen	N	0.10 max.	%	0.048	Within limit

**Remark(s):**

- I. Test results only relate to the specimen tested.
- II. Test results of the specimen are in compliance with the chemical requirements of BS EN 10088-3:2014, Table 2, Grade 1.4401 (316).

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Page 1 of 2

Specimen No.: CHEM-221005-2123-001

Castco LRN: 221005-2123

**Details as supplied by customer**

Name of Customer : Gate Way Valve & Fitting Limited

Address : Flat A1, 4/F, Galaxy Fty Bldg, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong

Job Title : --

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN80 Cast Iron Pressure Reducing Valve (Seat)

Specification : BS EN 10088-1:2014, Table 2, Grade 1.4401 (316)

Specimen No. : 220922-2128-002

Sample Identification No. : -- / Model No. : GD-200HS / Origin : Thailand

Manufacturer : Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake

**Test Method(s):-**

- 1) BS EN ISO 15350 : 2010
- 2) ST-Multi-1(ICP-OES)
- 3) BS EN ISO 15351: 2010

**Remark(s):**

I. Test results only relate to the specimen tested.

Checked by :

Lau Hiu Yat  
Assistant Technical Manager

Approved Signatory :

Cheng Chi Fai  
Senior Manager



**Test Report**  
**Chemical Analysis of Steel**Date of issue: 19-10-2022  
Page 2 of 2Specimen No.: CHEM-221005-2123-001  
Castco LRN: 221005-2123**Laboratory test details**Date of Request Confirmed: 05-10-2022 Date of Received by Lab.: 05-10-2022  
Testing Period: 06-10-2022 to 14-10-2022

Chemical Analysis		Result
1) Total Carbon Content	C %	0.050
1) Total Sulfur Content	S %	0.022
2) Chromium	Cr %	17.33
2) Manganese	Mn %	1.44
2) Molybdenum	Mo %	2.17
2) Nickel	Ni %	10.15
2) Phosphorus	P %	0.033
2) Silicon	Si %	0.284
3) Nitrogen	N %	0.048

**End of Report**

Form No.: CHM Steel-1 T dd 16/12/2015

## Appendix A

### Summary of Chemical Analysis of Steel

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2123-001

Page 1 of 1

Castco LRN: 221005-2123

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: --

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Castco LRN:	221005-2123				
Sample Description :	DN80 Cast Iron Pressure Reducing Valve (Seat)				
Specimen No. :	220922-2128-002				
Sample Identification No.:	-- / Model No. : GD-200HS / Origin : Thailand				
Manufacturer :	Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake				
Specification: BS EN 10088-1:2014, Table 2, Grade 1.4401 (316)			Test Results	Within / Exceed limit	
Carbon	C	0.07 max.	%	0.050	Within limit
Sulfur	S	0.030 max. <sup>(III)</sup>	%	0.022	Within limit
Chromium	Cr	16.5 to 18.5	%	17.33	Within limit
Manganese	Mn	2.00 max.	%	1.44	Within limit
Molybdenum	Mo	2.00 to 2.50	%	2.17	Within limit
Nickel	Ni	10.0 to 13.0	%	10.15	Within limit
Phosphorus	P	0.045 max.	%	0.033	Within limit
Silicon	Si	1.00 max.	%	0.284	Within limit
Nitrogen	N	0.10 max.	%	0.048	Within limit

#### Remark(s):

- I. Test results only relate to the specimen tested.
- II. Test results of the specimen are in compliance with the chemical requirements of BS EN 10088-1:2014, Table 2, Grade 1.4401 (316).
- III. For bars, rods, wire, sections, bright products and the relevant semi-finished products, a maximum content of 0.030 % S applies. Particular ranges of sulfur content may provide improvement of particular properties. For machinability a controlled sulfur content of 0.015 % to 0.030 % is recommended and permitted. For weldability, a controlled sulfur content of 0.008 % to 0.030 % is recommended and permitted. For polishability, a controlled sulfur content of 0.015 % max. is recommended.

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2124-001

Page 1 of 2

Castco LRN: 221005-2124

**Details as supplied by customer**

Name of Customer : Gate Way Valve & Fitting Limited

Address : Flat A1, 4/F, Galaxy Pty Bldg, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong

Job Title : --

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN80 Cast Iron Pressure Reducing Valve (Stem)

Specification : BS EN 10088-3:2014, Table 2, Grade 1.4401 (316)

Specimen No. : 220922-2128-002

Sample Identification No. : -- / Model No. : GD-200HS / Origin : Thailand

Manufacturer : Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake

**Test Method(s):-**

- 1) BS EN ISO 15350 : 2010
- 2) ST-Multi-1(ICP-OES)
- 3) BS EN ISO 15351: 2010

**Remark(s):**

- I. Test results only relate to the specimen tested.

Checked by :

  
Lau Hiu Yat  
Assistant Technical Manager

Approved Signatory :

  
Cheng Chi Fai  
Senior Manager

**Test Report  
Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2124-001

Page 2 of 2

Castco LRN: 221005-2124

**Laboratory test details**

Date of Request Confirmed: 05-10-2022

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Chemical Analysis		Result
1) Total Carbon Content	C %	0.051
1) Total Sulfur Content	S %	0.023
2) Chromium	Cr %	17.21
2) Manganese	Mn %	1.44
2) Molybdenum	Mo %	2.16
2) Nickel	Ni %	10.09
2) Phosphorus	P %	0.033
2) Silicon	Si %	0.284
3) Nitrogen	N %	0.049

**End of Report**

Form No.: CHM Steel-1 T dd 16/12/2015

## Appendix A

## Summary of Chemical Analysis of Steel

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2124-001

Page 1 of 1

Castco LRN: 221005-2124

Name of Customer: Gate Way Valve &amp; Fitting Limited

Job Title: --

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Castco LRN:	221005-2124				
Sample Description :	DN80 Cast Iron Pressure Reducing Valve (Stem)				
Specimen No. :	220922-2128-002				
Sample Identification No.:	-- / Model No. : GD-200HS / Origin : Thailand				
Manufacturer :	Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake				
Specification: BS EN 10088-3:2014, Table 2, Grade 1.4401 (316)			Test Results	Within / Exceed limit	
Carbon	C	0.07 max.	%	0.051	Within limit
Sulfur	S	0.030 max.	%	0.023	Within limit
Chromium	Cr	16.5 to 18.5	%	17.21	Within limit
Manganese	Mn	2.00 max.	%	1.44	Within limit
Molybdenum	Mo	2.00 to 2.50	%	2.16	Within limit
Nickel	Ni	10.0 to 13.0	%	10.09	Within limit
Phosphorus	P	0.045 max.	%	0.033	Within limit
Silicon	Si	1.00 max.	%	0.284	Within limit
Nitrogen	N	0.10 max.	%	0.049	Within limit

**Remark(s):**

- I. Test results only relate to the specimen tested.
- II. Test results of the specimen are in compliance with the chemical requirements of BS EN 10088-3:2014, Table 2, Grade 1.4401 (316).

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2125-001

Page 1 of 2

Castco LRN: 221005-2125

**Details as supplied by customer**

Name of Customer : Gate Way Valve & Fitting Limited

Address : Flat A1, 4/F, Galaxy Fty Bldg, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong

Job Title : --

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN150 Cast Iron Pressure Reducing Valve (Seat)

Specification : BS EN 10088-1:2014, Table 2, Grade 1.4401 (316)

Specimen No. : 220922-2128-004

Sample Identification No. : -- / Model No. : GD-200HS / Origin : Thailand

Manufacturer : Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake

**Test Method(s):-**

- 1) BS EN ISO 15350 : 2010
- 2) ST-Multi-1(ICP-OES)
- 3) BS EN ISO 15351: 2010

**Remark(s):**

I. Test results only relate to the specimen tested.

Checked by :

Lau Hiu Yat  
Assistant Technical Manager

Approved Signatory :

Cheng Chi Fai  
Senior Manager

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2125-001

Page 2 of 2

Castco LRN: 221005-2125

**Laboratory test details**

Date of Request Confirmed: 05-10-2022

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Chemical Analysis		Result
1) Total Carbon Content	C %	0.050
1) Total Sulfur Content	S %	0.022
2) Chromium	Cr %	17.63
2) Manganese	Mn %	1.46
2) Molybdenum	Mo %	2.20
2) Nickel	Ni %	10.23
2) Phosphorus	P %	0.032
2) Silicon	Si %	0.281
3) Nitrogen	N %	0.048

**End of Report**

Form No.: CHM Steel-1 T dd 16/12/2015

## Appendix A

## Summary of Chemical Analysis of Steel

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2125-001

Page 1 of 1

Castco LRN: 221005-2125

Name of Customer: Gate Way Valve &amp; Fitting Limited

Job Title: --

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Castco LRN:	221005-2125				
Sample Description :	DN150 Cast Iron Pressure Reducing Valve (Seat)				
Specimen No. :	220922-2128-004				
Sample Identification No.:	-- / Model No. : GD-200HS / Origin : Thailand				
Manufacturer :	Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake				
Specification: BS EN 10088-1:2014, Table 2, Grade 1.4401 (316)			Test Results	Within / Exceed limit	
Carbon	C	0.07 max.	%	0.050	Within limit
Sulfur	S	0.030 max. <sup>(III)</sup>	%	0.022	Within limit
Chromium	Cr	16.5 to 18.5	%	17.63	Within limit
Manganese	Mn	2.00 max.	%	1.46	Within limit
Molybdenum	Mo	2.00 to 2.50	%	2.20	Within limit
Nickel	Ni	10.0 to 13.0	%	10.23	Within limit
Phosphorus	P	0.045 max.	%	0.032	Within limit
Silicon	Si	1.00 max.	%	0.281	Within limit
Nitrogen	N	0.10 max.	%	0.048	Within limit

**Remark(s):**

- I. Test results only relate to the specimen tested.
- II. Test results of the specimen are in compliance with the chemical requirements of BS EN 10088-1:2014, Table 2, Grade 1.4401 (316).
- III. For bars, rods, wire, sections, bright products and the relevant semi-finished products, a maximum content of 0.030 % S applies. Particular ranges of sulfur content may provide improvement of particular properties. For machinability a controlled sulfur content of 0.015 % to 0.030 % is recommended and permitted. For weldability, a controlled sulfur content of 0.008 % to 0.030 % is recommended and permitted. For polishability, a controlled sulfur content of 0.015 % max. is recommended.



**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2126-001

Page 1 of 2

Castco LRN: 221005-2126

**Details as supplied by customer**

Name of Customer : Gate Way Valve & Fitting Limited

Address : Flat A1, 4/F, Galaxy Fty Bldg, 25-27 Luk Hop Street, San Po Kong, Kowloon, Hong Kong

Job Title : --

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN150 Cast Iron Pressure Reducing Valve (Stem)

Specification : BS EN 10088-3:2014, Table 2, Grade 1.4401 (316)

Specimen No. : 220922-2128-004

Sample Identification No. : -- / Model No. : GD-200HS / Origin : Thailand

Manufacturer : Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake

**Test Method(s):-**

- 1) BS EN ISO 15350 : 2010
- 2) ST-Multi-1(ICP-OES)
- 3) BS EN ISO 15351: 2010

**Remark(s):**

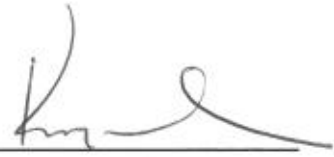
- I. Test results only relate to the specimen tested.

Checked by :

  
Lau Hiu Yat

Assistant Technical Manager

Approved Signatory :

  
Cheng Chi Fai

Senior Manager

**Test Report**  
**Chemical Analysis of Steel**

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2126-001

Page 2 of 2

Castco LRN: 221005-2126

**Laboratory test details**

Date of Request Confirmed: 05-10-2022

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Chemical Analysis		Result
1) Total Carbon Content	C %	0.051
1) Total Sulfur Content	S %	0.024
2) Chromium	Cr %	17.12
2) Manganese	Mn %	1.43
2) Molybdenum	Mo %	2.15
2) Nickel	Ni %	10.07
2) Phosphorus	P %	0.033
2) Silicon	Si %	0.287
3) Nitrogen	N %	0.048

**End of Report**

Form No.: CHM Steel-1 T dd 16/12/2015

## Appendix A

## Summary of Chemical Analysis of Steel

Date of issue: 19-10-2022

Specimen No.: CHEM-221005-2126-001

Page 1 of 1

Castco LRN: 221005-2126

Name of Customer: Gate Way Valve &amp; Fitting Limited

Job Title: --

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 05-10-2022

Testing Period: 06-10-2022 to 14-10-2022

Castco LRN:	221005-2126				
Sample Description :	DN150 Cast Iron Pressure Reducing Valve (Stem)				
Specimen No. :	220922-2128-004				
Sample Identification No.:	-- / Model No. : GD-200HS / Origin : Thailand				
Manufacturer :	Yoshitake Works (Thailand) Ltd. / Brand name: Yoshitake				
Specification: BS EN 10088-3:2014, Table 2, Grade 1.4401 (316)			Test Results	Within / Exceed limit	
Carbon	C	0.07 max.	%	0.051	Within limit
Sulfur	S	0.030 max.	%	0.024	Within limit
Chromium	Cr	16.5 to 18.5	%	17.12	Within limit
Manganese	Mn	2.00 max.	%	1.43	Within limit
Molybdenum	Mo	2.00 to 2.50	%	2.15	Within limit
Nickel	Ni	10.0 to 13.0	%	10.07	Within limit
Phosphorus	P	0.045 max.	%	0.033	Within limit
Silicon	Si	1.00 max.	%	0.287	Within limit
Nitrogen	N	0.10 max.	%	0.048	Within limit

**Remark(s):**

- I. Test results only relate to the specimen tested.
- II. Test results of the specimen are in compliance with the chemical requirements of BS EN 10088-3:2014, Table 2, Grade 1.4401 (316).