

Summary of Test Results

Reference no. : BC-SUMMARY-2022-054

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 : Bronze Gate Valve
Nominal pressure (PN) : 25
Manufacturer : Kitz (Thailand) Ltd.
Brand name : Toyo
Body marking : RED WHITE TOYO (Size in Inch) 125S 200WOG
Model no. : 206P
Origin : Thailand
Sample submitted by : Gate Way Valve & Fitting Ltd.
Test standard : BS EN 12288 : 2010 / BS EN 1982 : 2008 / BS EN 12164 : 2016
Test period : 14 April to 08 July 2022

A) Sample List

DN (mm)	Inch	Specimen no.
15	1/2"	220406-2223-001
20	3/4"	220406-2223-002
25	1"	220406-2223-003
32	1-1/4"	220406-2223-004
40	1-1/2"	220406-2223-005
50	2"	220406-2223-006

B) Test Item**1) Dimensions Check (BS EN 12288 : 2010 Clause 4.2.4)**

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220406-2223
20	3/4"	Passed	
25	1"	Passed	
32	1-1/4"	Passed	
40	1-1/2"	Passed	
50	2"	Passed	

2) Pressure Test (BS EN 12288 : 2010 Clause 5.1)

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220406-2223
20	3/4"	Passed	
25	1"	Passed	
32	1-1/4"	Passed	
40	1-1/2"	Passed	
50	2"	Passed	

Remark(s) :

1. This page no. 1B of this summary supersedes page no. 1A of the previous summary of Reference no. : BC-SUMMARY-2022-054 issued on 19 July 2022.

Summary of Test Results

Reference no. : BC-SUMMARY-2022-054

B) Test Item (con't)**3) Chemical Composition (Body) (BS EN 1982 : 2008 Table 23b Grade CC491K)**

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220421-2091
25	1"	Passed	220421-2095
50	2"	Passed	220421-2099

4) Chemical Composition (Bonnet) (BS EN 1982 : 2008 Table 23b Grade CC491K)

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220421-2092
25	1"	Passed	220421-2096
50	2"	Passed	220421-2100

5) Chemical Composition (Seat) (BS EN 1982 : 2008 Table 23b Grade CC491K)

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220421-2093
25	1"	Passed	220421-2097
50	2"	Passed	220421-2101

6) Chemical Composition (Stem) (BS EN 12164 : 2016 Table 6 Grade CW602N)

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220624-2216
25	1"	Passed	220624-2217
50	2"	Passed	220624-2218

Remark(s) :

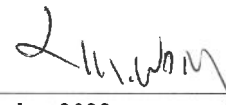
1. This page no. 2B of this summary supersedes page no. 2A of the previous summary of Reference no. : BC-SUMMARY-2022-054 issued on 19 July 2022.

Prepare by : _____


FU HO MAN
Assistant Technical Manager

Date : 05 September 2022

Review by : _____


WONG KA MAN
Senior Manager

Date : 05 September 2022

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Test Report
Copper Alloy Gate Valves - Dimensions

(In-house method VAL-COPPER-DIM-EN12288 in conjunction with the following specification(s) : BS EN 12288 : 2010 Cl. 4.2.4)

Date of issue : 12 May 2022

Page 1 of 6 page(s)

Castco LRN : 220406-2223

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 : WSD GA renew of Toyo Fig. 206P, Bronze Gate Valve to PN25, Screw End

Sample description : Bronze Gate Valve

Nominal pressure (PN) : 25

Manufacturer : Kitz (Thailand) Ltd.

Brand name : Toyo

Body marking : RED WHITE TOYO (Size in Inch) 125S 200WOG

Model no. : 206P

Origin : Thailand

Sample submitted by : Gate Way Valve & Fitting Ltd.

Laboratory test results

Date of sample received : 06 April 2022

Date of test : 19 April 2022

Specimen no.	220406-2223-001	220406-2223-002	220406-2223-003	220406-2223-004	220406-2223-005	220406-2223-006	
DN (mm)	15	20	25	32	40	50	
Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	
Ambient temperature (°C)	21.0	21.0	21.0	21.0	21.0	21.0	
A (mm)	Measured mean value	15.0	17.5	20.0	22.5	22.5	27.0
	Requirement	min. 15.0	min. 16.3	min. 19.1	min. 21.4	min. 21.4	min. 25.7
B (mm)	Measured mean value	9.5	11.0	14.0	15.0	14.0	18.5
	Requirement	min. 9.0	min. 10.0	min. 11.5	min. 13.5	min. 13.5	min. 17.0
D (mm)	Measured mean value	26.04	32.07	39.06	49.08	55.21	68.23
	Requirement	min. 26.0	min. 32.0	min. 39.0	min. 49.0	min. 55.0	min. 68.0

Remark(s) :

1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS EN 12288 : 2010 Table 6 (this specification is not covered by the laboratory's HOKLAS accreditation).
3. 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.



Figure A - Graphical representation of a binary acceptance - Simple acceptance

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

Approved Signatory : **WONG KA MAN**
Senior Manager

Form no. : BC_COPPER ALLOY GATE VALVES_DIM_BSEN12288-2010_T_dd_01/06/2021

Test Report
Copper Alloy Gate Valves - Shell and Seat Tightness
(BS EN 12266-1 : 2012 Annex A3 and A4 in conjunction with following specification(s) :
BS EN 12288 : 2010 Clause 5.1)

Date of issue : 12 May 2022

Page 2 of 6 page(s)

Castco LRN : 220406-2223

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 : WSD GA renew of Toyo Fig. 206P, Bronze Gate Valve to PN25, Screw End

Sample description : Bronze Gate Valve

Nominal pressure (PN) : 25

Manufacturer : Kitz (Thailand) Ltd.

Brand name : Toyo

Body marking : RED WHITE TOYO (Size in Inch) 125S 200WOG

Model no. : 206P

Origin : Thailand

Sample submitted by : Gate Way Valve & Fitting Ltd.

Laboratory test results

Date of sample received : 06 April 2022

Date of test : 14 April 2022

A) Shell Tightness

Specimen no.	220406-2223-001	220406-2223-002	220406-2223-003	220406-2223-004	220406-2223-005	220406-2223-006
DN (mm)	15	20	25	32	40	50
Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Water temperature (°C)	22.0	22.0	22.0	22.0	22.0	22.0
Apply pressure (bar)	37.5	37.5	37.5	37.5	37.5	37.5
Test duration (s)	60	60	60	60	60	60
Visually detectable leakage	No	No	No	No	No	No
Requirement	Visually detectable leakage is not permitted					

Test Report**Copper Alloy Gate Valves - Shell and Seat Tightness**(BS EN 12266-1 : 2012 Annex A3 and A4 in conjunction with following specification(s) :
BS EN 12288 : 2010 Clause 5.1)

Date of issue : 12 May 2022

Page 3 of 6 page(s)

Castco LRN : 220406-2223

Laboratory test results**B) Seat Tightness**

Specimen no.	220406-2223-001	220406-2223-002	220406-2223-003	220406-2223-004	220406-2223-005	220406-2223-006
DN (mm)	15	20	25	32	40	50
Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
Water temperature (°C)	22.0	22.0	22.0	22.0	22.0	22.0
Side	A	A	A	A	A	A
Apply pressure (bar)	27.5	27.5	27.5	27.5	27.5	27.5
Test duration (s)	60	60	60	60	60	60
Leakage rate (mm ³ /s)	0	0	0	0	0	0
Side	B	B	B	B	B	B
Apply pressure (bar)	27.5	27.5	27.5	27.5	27.5	27.5
Test duration (s)	60	60	60	60	60	60
Leakage rate (mm ³ /s)	0	0	0	0	0	0
Requirement	The leakage rate shall not exceed specified in BS EN 12266-1 : 2012 Annex A.4.3 Table A.5					

Remark(s) :

1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS EN 12288 : 2010 Clause 4.3.3 and 4.3.4 (this specification is not covered by the laboratory's HOKLAS accreditation).
3. For test with qualitative test results, effect of measurement uncertainty has not been taken into account.

Checked by : _____


FU HO MAN
Assistant Technical Manager

Approved Signatory : _____


WONG KA MAN
Senior Manager

Test Report

Copper Alloy Gate Valves - Dimensions

(In-house method VAL-COPPER-DIM-EN12288 in conjunction with the following specification(s) : BS EN 12288 : 2010 Cl. 4.2.4)

Date of issue : 12 May 2022

Page 4 of 6 page(s)

Castco LRN : 220406-2223

Appendix A220406-2223-001(1)220406-2223-001(2)220406-2223-002(1)220406-2223-002(2)220406-2223-003(1)220406-2223-003(2)

Test Report

Copper Alloy Gate Valves - Dimensions

(In-house method VAL-COPPER-DIM-EN12288 in conjunction with the following specification(s) : BS EN 12288 : 2010 Cl. 4.2.4)

Date of issue : 12 May 2022

Castco LRN : 220406-2223

Page 5 of 6 page(s)

Appendix B



220406-2223-004(1)



220406-2223-004(2)



220406-2223-005(1)



220406-2223-005(2)



220406-2223-006(1)



220406-2223-006(2)

Test Report

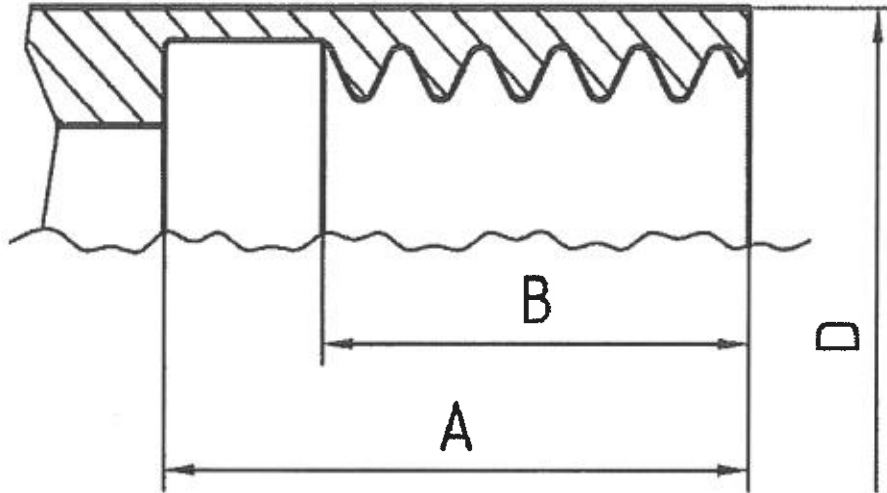
Copper Alloy Gate Valves - Dimensions

(In-house method VAL-COPPER-DIM-EN12288 in conjunction with the following specification(s) : BS EN 12288 : 2010 Cl. 4.2.4)

Date of issue : 12 May 2022

Page 6 of 6 page(s)

Castco LRN : 220406-2223

Appendix C

220406-2223 (Dimensions Figure)

End of Report

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 11-05-2022
Page 1 of 2Specimen No.: CHEM-220421-2091-001
Castco LRN: 220421-2091**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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN15 Bronze Gate Valve (Body)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-001

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --


Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2091-001

Page 2 of 2

Castco LRN: 220421-2091

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.045
1) Nickel	Ni %	0.17
1) Phosphorus	P %	0.020
1) Lead	Pb %	5.55
1) Sulphur	S %	0.038
1) Antimony	Sb %	0.077
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.55
1) Zinc	Zn %	5.80
1) Copper	Cu %	83.7

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2091-001

Page 1 of 1

Related Castco LRN: 220421-2091

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Castco LRN:	220421-2091				
Specimen No. :	220406-2223-001				
Sample Description :	DN15 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.045	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.020	Within limit
Lead	Pb	4.0 to 6.0	%	5.55	Within limit
Sulfur	S	0.10 max.	%	0.038	Within limit
Antimony	Sb	0.25 max.	%	0.077	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.55	Within limit
Zinc	Zn	4.0 to 6.0	%	5.80	Within limit
Copper	Cu	83.0 to 87.0	%	83.7	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2092-001

Page 1 of 2

Castco LRN: 220421-2092

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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN15 Bronze Gate Valve (Bonnet)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-001

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2092-001

Page 2 of 2

Castco LRN: 220421-2092

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.050
1) Nickel	Ni %	0.17
1) Phosphorus	P %	0.020
1) Lead	Pb %	5.21
1) Sulphur	S %	0.036
1) Antimony	Sb %	0.052
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.20
1) Zinc	Zn %	5.54
1) Copper	Cu %	84.6

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2092-001

Page 1 of 1

Related Castco LRN: 220421-2092

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Castco LRN:	220421-2092				
Specimen No. :	220406-2223-001				
Sample Description :	DN15 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.050	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.020	Within limit
Lead	Pb	4.0 to 6.0	%	5.21	Within limit
Sulfur	S	0.10 max.	%	0.036	Within limit
Antimony	Sb	0.25 max.	%	0.052	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.20	Within limit
Zinc	Zn	4.0 to 6.0	%	5.54	Within limit
Copper	Cu	83.0 to 87.0	%	84.6	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2093-001

Page 1 of 2

Castco LRN: 220421-2093

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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN15 Bronze Gate Valve (Seat)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-001

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)


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 Copper and Copper Alloy**Date of issue : 11-05-2022
Page 2 of 2Specimen No.: CHEM-220421-2093-001
Castco LRN: 220421-2093**Laboratory test details**

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.043
1) Nickel	Ni %	0.31
1) Phosphorus	P %	0.017
1) Lead	Pb %	5.52
1) Sulphur	S %	0.037
1) Antimony	Sb %	0.035
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.80
1) Zinc	Zn %	5.93
1) Copper	Cu %	83.3

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2093-001

Page 1 of 1

Related Castco LRN: 220421-2093

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Castco LRN:	220421-2093				
Specimen No. :	220406-2223-001				
Sample Description :	DN15 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.043	Within limit
Nickel	Ni	2.0 max.	%	0.31	Within limit
Phosphorus	P	0.10 max.	%	0.017	Within limit
Lead	Pb	4.0 to 6.0	%	5.52	Within limit
Sulfur	S	0.10 max.	%	0.037	Within limit
Antimony	Sb	0.25 max.	%	0.035	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.80	Within limit
Zinc	Zn	4.0 to 6.0	%	5.93	Within limit
Copper	Cu	83.0 to 87.0	%	83.3	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2216-001

Page 1 of 3

Castco LRN: 220624-2216

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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : -- / Origin : Thailand

Sample Description : DN15 Bronze Gate Valve (Stem)

Specification : BS EN 12164:2016, Table 6, Grade CW602N

Specimen No. : 220406-2223-001

Sample Identification No.: -- / Model no.: 206P

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

- 1) In-house ST-Multi-4 (Spark-OES for Brass)
- 2) By Calculation

Remark:


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 Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2216-001

Page 2 of 3

Castco LRN: 220624-2216

Laboratory test details

Date of Request Confirmed: 24-06-2022

Date of Received by Lab.: 24-06-2022

Testing Period: 08-07-2022

Chemical Analysis		Result
¹⁾ Aluminium	Al %	<0.003
¹⁾ Arsenic	As %	0.061
¹⁾ Iron	Fe %	<0.024
¹⁾ Manganese	Mn %	<0.010
¹⁾ Nickel	Ni %	<0.013
¹⁾ Lead	Pb %	2.21
¹⁾ Tin	Sn %	0.008
¹⁾ Zinc	Zn %	36.1
¹⁾ Copper	Cu %	61.6

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2216-001

Page 3 of 3

Castco LRN: 220624-2216

Laboratory test details

Date of Request Confirmed: 24-06-2022

Date of Received by Lab.: 24-06-2022

Testing Period: 08-07-2022

Chemical Analysis	Result
²⁾ Others Total %	<0.1

End of Report

Form No.: CHM Cu&Cu Alloy-3 T dd 03/02/2016

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2216-001

Page 1 of 1

Related Castco LRN: 220624-2216

Name of Customer: Gate Way Valve & Fitting Limited
 Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
 Contract No.: --
 Customer's Ref. No.: --
 Date of Received by Lab.: 24-06-2022 Testing Period: 08-07-2022

Castco LRN:	220624-2216			
Specimen No.:	220406-2223-001			
Sample Description :	DN15 Bronze Gate Valve (Stem)			
Sample Identification No.:	-- / Model no.: 206P			
Manufacturer:	Kitz (Thailand) Ltd. / Brand name : Toyo			
Specification: BS EN 12164:2016, Table 6, Grade CW602N	Test Results		Within / Exceed limit	
Aluminium Al 0.05 max. %	<0.003		Within limit	
Arsenic As 0.02 to 0.15 %	0.061		Within limit	
Iron Fe 0.1 max. %	<0.024		Within limit	
Manganese Mn 0.1 max. %	<0.010		Within limit	
Nickel Ni 0.3 max. %	<0.013		Within limit	
Lead Pb 1.7 to 2.8 %	2.21		Within limit	
Tin Sn 0.1 max. %	0.008		Within limit	
Zinc Zn Remainder %	36.1		Within limit	
Copper Cu 61.0 to 63.0 %	61.6		Within limit	
Others Total 0.2 max. %	<0.1		Within limit	

Remark(s):

- Test results only relate to the specimen tested.
- Test results of the specimen are in compliance with the chemical requirements of BS EN 12164:2016, Table 6, Grade CW602N.

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 11-05-2022
Page 1 of 2Specimen No.: CHEM-220421-2095-001
Castco LRN: 220421-2095**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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN25 Bronze Gate Valve (Body)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-003

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)


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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2095-001

Page 2 of 2

Castco LRN: 220421-2095

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
¹⁾ Aluminium	Al %	<0.003
¹⁾ Iron	Fe %	0.048
¹⁾ Nickel	Ni %	0.17
¹⁾ Phosphorus	P %	0.020
¹⁾ Lead	Pb %	5.16
¹⁾ Sulphur	S %	0.036
¹⁾ Antimony	Sb %	0.075
¹⁾ Silicon	Si %	<0.002
¹⁾ Tin	Sn %	4.06
¹⁾ Zinc	Zn %	5.95
¹⁾ Copper	Cu %	84.4

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2095-001

Page 1 of 1

Related Castco LRN: 220421-2095

Name of Customer: Gate Way Valve & Fitting Limited
 Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
 Contract No.: --
 Customer's Ref. No.: --
 Date of Received by Lab.: 21-04-2022 Testing Period: 27-04-2022

Castco LRN:	220421-2095				
Specimen No. :	220406-2223-003				
Sample Description :	DN25 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.048	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.020	Within limit
Lead	Pb	4.0 to 6.0	%	5.16	Within limit
Sulfur	S	0.10 max.	%	0.036	Within limit
Antimony	Sb	0.25 max.	%	0.075	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.06	Within limit
Zinc	Zn	4.0 to 6.0	%	5.95	Within limit
Copper	Cu	83.0 to 87.0	%	84.4	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 11-05-2022
Page 1 of 2Specimen No.: CHEM-220421-2096-001
Castco LRN: 220421-2096**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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN25 Bronze Gate Valve (Bonnet)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-003

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2096-001

Page 2 of 2

Castco LRN: 220421-2096

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.044
1) Nickel	Ni %	0.17
1) Phosphorus	P %	0.025
1) Lead	Pb %	5.45
1) Sulphur	S %	0.036
1) Antimony	Sb %	0.057
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.42
1) Zinc	Zn %	5.67
1) Copper	Cu %	84.0

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2096-001

Page 1 of 1

Related Castco LRN: 220421-2096

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Castco LRN:	220421-2096				
Specimen No. :	220406-2223-003				
Sample Description :	DN25 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.044	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.025	Within limit
Lead	Pb	4.0 to 6.0	%	5.45	Within limit
Sulfur	S	0.10 max.	%	0.036	Within limit
Antimony	Sb	0.25 max.	%	0.057	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.42	Within limit
Zinc	Zn	4.0 to 6.0	%	5.67	Within limit
Copper	Cu	83.0 to 87.0	%	84.0	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 11-05-2022
Page 1 of 2Specimen No.: CHEM-220421-2097-001
Castco LRN: 220421-2097**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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN25 Bronze Gate Valve (Seat)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-003

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2097-001

Page 2 of 2

Castco LRN: 220421-2097

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.021
1) Nickel	Ni %	0.14
1) Phosphorus	P %	0.024
1) Lead	Pb %	5.52
1) Sulphur	S %	0.038
1) Antimony	Sb %	0.055
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.62
1) Zinc	Zn %	5.52
1) Copper	Cu %	84.0

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2097-001

Page 1 of 1

Related Castco LRN: 220421-2097

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Castco LRN:	220421-2097				
Specimen No. :	220406-2223-003				
Sample Description :	DN25 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.021	Within limit
Nickel	Ni	2.0 max.	%	0.14	Within limit
Phosphorus	P	0.10 max.	%	0.024	Within limit
Lead	Pb	4.0 to 6.0	%	5.52	Within limit
Sulfur	S	0.10 max.	%	0.038	Within limit
Antimony	Sb	0.25 max.	%	0.055	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.62	Within limit
Zinc	Zn	4.0 to 6.0	%	5.52	Within limit
Copper	Cu	83.0 to 87.0	%	84.0	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue: 13-07-2022
Page 1 of 3Specimen No.: CHEM-220624-2217-001
Castco LRN: 220624-2217**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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : -- / Origin : Thailand

Sample Description : DN25 Bronze Gate Valve (Stem)

Specification : BS EN 12164:2016, Table 6, Grade CW602N

Specimen No. : 220406-2223-003

Sample Identification No.: -- / Model no.: 206P

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

- 1) In-house ST-Multi-4 (Spark-OES for Brass)
- 2) By Calculation

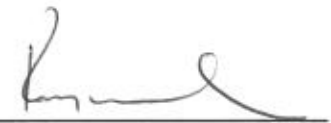
Remark:

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 Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2217-001

Page 2 of 3

Castco LRN: 220624-2217

Laboratory test details

Date of Request Confirmed: 24-06-2022

Date of Received by Lab.: 24-06-2022

Testing Period:

08-07-2022

Chemical Analysis		Result
¹⁾ Aluminium	Al %	<0.003
¹⁾ Arsenic	As %	0.062
¹⁾ Iron	Fe %	<0.024
¹⁾ Manganese	Mn %	<0.010
¹⁾ Nickel	Ni %	<0.013
¹⁾ Lead	Pb %	2.19
¹⁾ Tin	Sn %	0.007
¹⁾ Zinc	Zn %	35.1
¹⁾ Copper	Cu %	62.7

Form No.: CHM Cu&Cu Alloy-3 T dd 03/02/2016

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2217-001

Page 3 of 3

Castco LRN: 220624-2217

Laboratory test details

Date of Request Confirmed: 24-06-2022

Date of Received by Lab.: 24-06-2022

Testing Period: 08-07-2022

Chemical Analysis	Result
²⁾ Others Total %	<0.1

End of Report

Form No.: CHM Cu&Cu Alloy-3 T dd 03/02/2016

Appendix A**Summary of Chemical Analysis of Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2217-001

Page 1 of 1

Related Castco LRN: 220624-2217

Name of Customer: Gate Way Valve & Fitting Limited
Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
Contract No.: --
Customer's Ref. No.: --
Date of Received by Lab.: 24-06-2022 Testing Period: 08-07-2022

Castco LRN:	220624-2217	
Specimen No.:	220406-2223-003	
Sample Description :	DN25 Bronze Gate Valve (Stem)	
Sample Identification No.:	-- / Model no.: 206P	
Manufacturer:	Kitz (Thailand) Ltd. / Brand name : Toyo	
Specification: BS EN 12164:2016, Table 6, Grade CW602N	Test Results	Within / Exceed limit
Aluminium Al 0.05 max. %	<0.003	Within limit
Arsenic As 0.02 to 0.15 %	0.062	Within limit
Iron Fe 0.1 max. %	<0.024	Within limit
Manganese Mn 0.1 max. %	<0.010	Within limit
Nickel Ni 0.3 max. %	<0.013	Within limit
Lead Pb 1.7 to 2.8 %	2.19	Within limit
Tin Sn 0.1 max. %	0.007	Within limit
Zinc Zn Remainder %	35.1	Within limit
Copper Cu 61.0 to 63.0 %	62.7	Within limit
Others Total 0.2 max. %	<0.1	Within limit

Remark(s):

- a. Test results only relate to the specimen tested.
- b. Test results of the specimen are in compliance with the chemical requirements of BS EN 12164:2016, Table 6, Grade CW602N.

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 11-05-2022
Page 1 of 2Specimen No.: CHEM-220421-2099-001
Castco LRN: 220421-2099**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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN50 Bronze Gate Valve (Body)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-006

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo


Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

Remark(s):

I. Test results only relate to the specimen tested.

Checked by : **Lau Hiu Yat**
Assistant Technical ManagerApproved Signatory : **Cheng Chi Fai**
Senior Manager

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2099-001

Page 2 of 2

Castco LRN: 220421-2099

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.035
1) Nickel	Ni %	0.18
1) Phosphorus	P %	0.023
1) Lead	Pb %	5.12
1) Sulphur	S %	0.035
1) Antimony	Sb %	0.066
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.37
1) Zinc	Zn %	5.91
1) Copper	Cu %	84.2

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2099-001

Page 1 of 1

Related Castco LRN: 220421-2099

Name of Customer: Gate Way Valve & Fitting Limited
Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
Contract No.: --
Customer's Ref. No.: --
Date of Received by Lab.: 21-04-2022 Testing Period: 27-04-2022

Castco LRN:	220421-2099				
Specimen No. :	220406-2223-006				
Sample Description :	DN50 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.035	Within limit
Nickel	Ni	2.0 max.	%	0.18	Within limit
Phosphorus	P	0.10 max.	%	0.023	Within limit
Lead	Pb	4.0 to 6.0	%	5.12	Within limit
Sulfur	S	0.10 max.	%	0.035	Within limit
Antimony	Sb	0.25 max.	%	0.066	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.37	Within limit
Zinc	Zn	4.0 to 6.0	%	5.91	Within limit
Copper	Cu	83.0 to 87.0	%	84.2	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2100-001

Page 1 of 2

Castco LRN: 220421-2100

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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN50 Bronze Gate Valve (Bonnet)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-006

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

- 1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2100-001

Page 2 of 2

Castco LRN: 220421-2100

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.037
1) Nickel	Ni %	0.16
1) Phosphorus	P %	0.023
1) Lead	Pb %	5.17
1) Sulphur	S %	0.034
1) Antimony	Sb %	0.048
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.46
1) Zinc	Zn %	5.85
1) Copper	Cu %	84.2

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2100-001

Page 1 of 1

Related Castco LRN: 220421-2100

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Castco LRN:	220421-2100				
Specimen No. :	220406-2223-006				
Sample Description :	DN50 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.037	Within limit
Nickel	Ni	2.0 max.	%	0.16	Within limit
Phosphorus	P	0.10 max.	%	0.023	Within limit
Lead	Pb	4.0 to 6.0	%	5.17	Within limit
Sulfur	S	0.10 max.	%	0.034	Within limit
Antimony	Sb	0.25 max.	%	0.048	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.46	Within limit
Zinc	Zn	4.0 to 6.0	%	5.85	Within limit
Copper	Cu	83.0 to 87.0	%	84.2	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2101-001

Page 1 of 2

Castco LRN: 220421-2101

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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Sample Description : DN50 Bronze Gate Valve (Seat)

Specification : BS EN 1982:2008, Table 23b, Grade CC491K

Specimen No. : 220406-2223-006

Sample Identification No.: -- / Model no.: 206P / Origin : Thailand

Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo

Location of Works : --

Test Method(s):-

1) In-house ST-Multi-4 (Spark-OES for Gunmetal)

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 Copper and Copper Alloy**

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2101-001

Page 2 of 2

Castco LRN: 220421-2101

Laboratory test details

Date of Request Confirmed: 21-04-2022

Date of Received by Lab.: 21-04-2022

Testing Period: 27-04-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.036
1) Nickel	Ni %	0.15
1) Phosphorus	P %	0.017
1) Lead	Pb %	5.12
1) Sulphur	S %	0.040
1) Antimony	Sb %	0.049
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.31
1) Zinc	Zn %	5.47
1) Copper	Cu %	84.7

End of Report

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 11-05-2022

Specimen No.: CHEM-220421-2101-001

Page 1 of 1

Related Castco LRN: 220421-2101

Name of Customer: Gate Way Valve & Fitting Limited
 Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
 Contract No.: --
 Customer's Ref. No.: --
 Date of Received by Lab.: 21-04-2022 Testing Period: 27-04-2022

Castco LRN:	220421-2101				
Specimen No. :	220406-2223-006				
Sample Description :	DN50 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 206P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				Test Results	Within / Exceed limit
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.036	Within limit
Nickel	Ni	2.0 max.	%	0.15	Within limit
Phosphorus	P	0.10 max.	%	0.017	Within limit
Lead	Pb	4.0 to 6.0	%	5.12	Within limit
Sulfur	S	0.10 max.	%	0.040	Within limit
Antimony	Sb	0.25 max.	%	0.049	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.31	Within limit
Zinc	Zn	4.0 to 6.0	%	5.47	Within limit
Copper	Cu	83.0 to 87.0	%	84.7	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 1982:2008, Table 23b, Grade CC491K.

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2218-001

Page 1 of 3

Castco LRN: 220624-2218

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 : WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
Contract No. : --
Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : -- / Origin : Thailand
Sample Description : DN50 Bronze Gate Valve (Stem)
Specification : BS EN 12164:2016, Table 6, Grade CW602N
Specimen No. : 220406-2223-006
Sample Identification No.: -- / Model no.: 206P
Manufacturer : Kitz (Thailand) Ltd. / Brand name : Toyo
Location of Works : --

Test Method(s):-

- 1) In-house ST-Multi-4 (Spark-OES for Brass)
- 2) By Calculation

Remark:


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 Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2218-001

Page 2 of 3

Castco LRN: 220624-2218

Laboratory test details

Date of Request Confirmed: 24-06-2022

Date of Received by Lab.: 24-06-2022

Testing Period: 08-07-2022

Chemical Analysis		Result
¹⁾ Aluminium	Al %	<0.003
¹⁾ Arsenic	As %	0.065
¹⁾ Iron	Fe %	0.039
¹⁾ Manganese	Mn %	<0.010
¹⁾ Nickel	Ni %	<0.013
¹⁾ Lead	Pb %	2.18
¹⁾ Tin	Sn %	0.028
¹⁾ Zinc	Zn %	35.6
¹⁾ Copper	Cu %	62.0

Form No.: CHM Cu&Cu Alloy-3 T dd 03/02/2016

Test Report**Chemical Analysis of Copper and Copper Alloy**

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2218-001

Page 3 of 3

Castco LRN: 220624-2218

Laboratory test details

Date of Request Confirmed: 24-06-2022

Date of Received by Lab.: 24-06-2022

Testing Period: 08-07-2022

Chemical Analysis	Result
²⁾ Others Total %	0.1

End of Report

Form No.: CHM Cu&Cu Alloy-3 T dd 03/02/2016

Appendix A

Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 13-07-2022

Specimen No.: CHEM-220624-2218-001

Page 1 of 1

Related Castco LRN: 220624-2218

Name of Customer: Gate Way Valve & Fitting Limited
 Job Title: WSD GA renew of Toyo Fig. 206P, bronze gate valve, screw end PN25
 Contract No.: --
 Customer's Ref. No.: --
 Date of Received by Lab.: 24-06-2022 Testing Period: 08-07-2022

Castco LRN:	220624-2218			
Specimen No.:	220406-2223-006			
Sample Description :	DN50 Bronze Gate Valve (Stem)			
Sample Identification No.:	-- / Model no.: 206P			
Manufacturer:	Kitz (Thailand) Ltd. / Brand name : Toyo			
Specification: BS EN 12164:2016, Table 6, Grade CW602N	Test Results		Within / Exceed limit	
Aluminium Al 0.05 max. %	<0.003		Within limit	
Arsenic As 0.02 to 0.15 %	0.065		Within limit	
Iron Fe 0.1 max. %	0.039		Within limit	
Manganese Mn 0.1 max. %	<0.010		Within limit	
Nickel Ni 0.3 max. %	<0.013		Within limit	
Lead Pb 1.7 to 2.8 %	2.18		Within limit	
Tin Sn 0.1 max. %	0.028		Within limit	
Zinc Zn Remainder %	35.6		Within limit	
Copper Cu 61.0 to 63.0 %	62.0		Within limit	
Others Total 0.2 max. %	0.1		Within limit	

Remark(s):

- a. Test results only relate to the specimen tested.
- b. Test results of the specimen are in compliance with the chemical requirements of BS EN 12164:2016, Table 6, Grade CW602N.