

**Summary of Test Results**

Reference no. : BC-SUMMARY-2022-102

Customer : Gate Way Valve &amp; 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) : 16

Manufacturer : Kitz (Thailand) Ltd.

Brand name : Toyo

Body marking : TOYO PN16 (DN)

Model no. : 272P

Origin : Thailand

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

Test standard : BS EN 12288 : 2010 / BS EN 1982 : 2008 / BS EN 12164 : 2016

Test period : 30 May to 29 July 2022

**A) Sample List**

DN (mm)	Inch	Specimen no.
15	1/2"	220525-2377-001
20	3/4"	220525-2377-002
25	1"	220525-2377-003
32	1-1/4"	220525-2377-004
40	1-1/2"	220525-2377-005
50	2"	220525-2377-006
65	2-1/2"	220525-2377-007
80	3"	220525-2377-008

**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	220525-2377
20	3/4"	Passed	
25	1"	Passed	
32	1-1/4"	Passed	
40	1-1/2"	Passed	
50	2"	Passed	
65	2-1/2"	Passed	
80	3"	Passed	

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

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220525-2377
20	3/4"	Passed	
25	1"	Passed	
32	1-1/4"	Passed	
40	1-1/2"	Passed	
50	2"	Passed	
65	2-1/2"	Passed	
80	3"	Passed	

### Summary of Test Results

Reference no. : BC-SUMMARY-2022-102

**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	220606-2528
25	1"	Passed	220606-2532
40	1-1/2"	Passed	220606-2536
50	2"	Passed	220606-2540
80	3"	Passed	220606-2544

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

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220606-2529
25	1"	Passed	220606-2533
40	1-1/2"	Passed	220606-2537
50	2"	Passed	220606-2541
80	3"	Passed	220606-2545

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

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220606-2530
25	1"	Passed	220606-2534
40	1-1/2"	Passed	220606-2538
50	2"	Passed	220606-2542
80	3"	Passed	220606-2546

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

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	220725-2047
25	1"	Passed	220606-2535
40	1-1/2"	Passed	220606-2539
50	2"	Passed	220606-2543
80	3"	Passed	220725-2048

Prepare by : \_\_\_\_\_  
Date : 02 August 2022

  
**FU HO MAN**  
Assistant Technical Manager

Review by : \_\_\_\_\_  
Date : 02 August 2022

  
**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 : 27 June 2022

Page 1 of 8 page(s)

Castco LRN : 220525-2377

**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 : WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Sample description : Bronze Gate Valve

Nominal pressure (PN) : 16

Manufacturer : Kitz (Thailand) Ltd.

Brand name : Toyo

Body marking : TOYO PN16 (DN)

Model no. : 272P

Origin : Thailand

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

**Laboratory test results**

Date of sample received : 25 May 2022

Date of test : 31 May 2022

Specimen no.		220525-2376-001	220525-2376-002	220525-2376-003	220525-2376-004	220525-2376-005	220525-2376-006	220525-2376-007	220525-2376-008	
DN (mm)		15	20	25	32	40	50	65	80	
Inch		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	
Ambient temperature (°C)		25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	
A (mm)	End face 1	Measured minimum value	15.27	17.70	20.05	22.32	23.42	26.04	31.29	34.38
	End face 2	Measured minimum value	15.25	17.05	20.15	22.10	23.74	26.09	32.04	34.72
	BS EN 12288 : 2010 Table 6 requirement		min. 15.0	min. 16.3	min. 19.1	min. 21.4	min. 21.4	min. 25.7	min. 30.2	min. 33.3
B (mm)	End face 1	Measured minimum value	9.11	11.28	12.71	13.75	15.04	17.14	18.57	23.07
	End face 2	Measured minimum value	9.32	11.07	12.24	14.03	14.10	17.02	18.61	23.20
	BS EN 12288 : 2010 Table 6 requirement		min. 9.0	min. 10.0	min. 11.5	min. 13.5	min. 13.5	min. 17.0	min. 18.5	min. 21.0

## 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 : 27 June 2022

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Castco LRN : 220525-2377

### Laboratory test results (con't)

Specimen no.		220525-2376-001	220525-2376-002	220525-2376-003	220525-2376-004	220525-2376-005	220525-2376-006	220525-2376-007	220525-2376-008	
DN (mm)		15	20	25	32	40	50	65	80	
Inch		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	
Ambient temperature (°C)		25.7	25.7	25.7	25.7	25.7	25.7	25.7	25.7	
D (mm)	End face 1	Measured minimum value	26.74	32.80	39.49	49.17	55.04	68.59	85.23	99.09
	End face 2	Measured minimum value	26.93	32.85	39.44	49.14	55.22	68.16	85.06	98.95
	BS EN 12288 : 2010 Table 6 requirement		min. 26.0	min. 32.0	min. 39.0	min. 49.0	min. 55.0	min. 68.0	min. 85.0	min. 98.0

### 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.

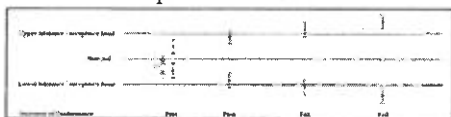


Figure A - Graphical representation of a binary statement - Simple acceptance

4. Threaded end connection suit for BS EN 10226-2 (Previously BS 21) taper threads.

Checked by :

  
**FU HO MAN**  
Assistant Technical Manager

Approved Signatory :

  
**WONG KA MAN**  
Senior Manager

## 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 : 27 June 2022

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Castco LRN : 220525-2377

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 : WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Sample description : Bronze Gate Valve

Nominal pressure (PN) : 16

Manufacturer : Kitz (Thailand) Ltd.

Brand name : Toyo

Body marking : TOYO PN16 (DN)

Model no. : 272P

Origin : Thailand

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

Laboratory test results

Date of sample received : 25 May 2022

Date of test : 30 May 2022

## A) Shell Tightness

Specimen no.	220525-2376-001	220525-2376-002	220525-2376-003	220525-2376-004	220525-2376-005	220525-2376-006	220525-2376-007	220525-2376-008
DN (mm)	15	20	25	32	40	50	65	80
Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
Water temperature (°C)	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
Apply pressure (bar)	24	24	24	24	24	24	24	24
Test duration (s)	60	60	60	60	60	60	60	60
Visually detectable leakage	No	No	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 : 27 June 2022

Page 4 of 8 page(s)

Castco LRN : 220525-2377

#### Laboratory test results

#### B) Seat Tightness

Specimen no.	220525-2376-001	220525-2376-002	220525-2376-003	220525-2376-004	220525-2376-005	220525-2376-006	220525-2376-007	220525-2376-008
DN (mm)	15	20	25	32	40	50	65	80
Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
Water temperature (°C)	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
Side	A	A	A	A	A	A	A	A
Apply pressure (bar)	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
Test duration (s)	60	60	60	60	60	60	60	60
Leakage rate (mm <sup>3</sup> /s)	0	0	0	0	0	0	0	0
Side	B	B	B	B	B	B	B	B
Apply pressure (bar)	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
Test duration (s)	60	60	60	60	60	60	60	60
Leakage rate (mm <sup>3</sup> /s)	0	0	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 : 27 June 2022

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Castco LRN : 220525-2377

Appendix A



220525-2377-001 (1)



220525-2377-001 (2)



220525-2377-002 (1)



220525-2377-002 (2)



220525-2377-003 (1)



220525-2377-003 (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 : 27 June 2022

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Castco LRN : 220525-2377

Appendix B220525-2377-004 (1)220525-2377-004 (2)220525-2377-005 (1)220525-2377-005 (2)220525-2377-006 (1)220525-2377-006 (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 : 27 June 2022

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Castco LRN : 220525-2377

## Appendix C

220525-2377-007 (1)220525-2377-007 (2)220525-2377-008 (1)220525-2377-008 (2)

Test Report

Copper Alloy Gate Valves - Dimensions

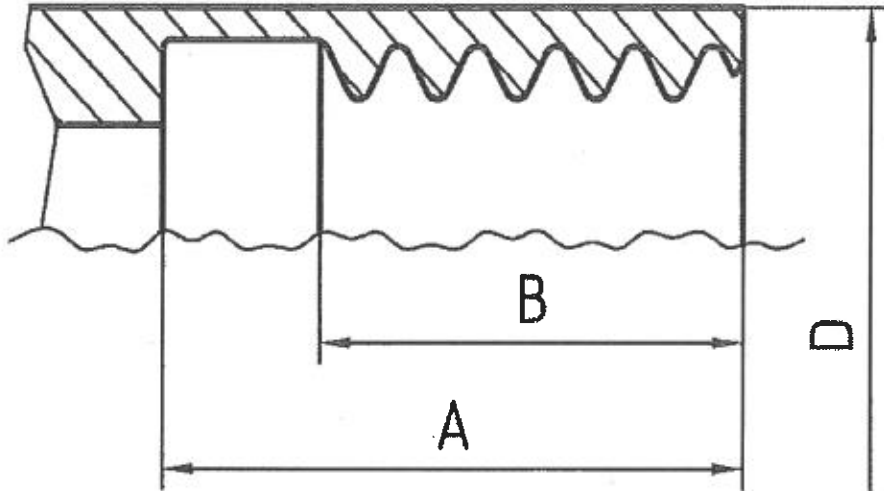
(In-house method VAL-COPPER-DIM-EN12288 in conjunction with the following specification(s) : BS EN 12288 : 2010 Cl. 4.2.4)

Date of issue : 27 June 2022

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Castco LRN : 220525-2377

Appendix D



220525-2377 (Dimensions Figure)

End of Report

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2528-001

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Castco LRN: 220606-2528

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-001

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2528-001

Page 2 of 2

Castco LRN: 220606-2528

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.079
<sup>1)</sup> Nickel	Ni %	0.16
<sup>1)</sup> Phosphorus	P %	0.015
<sup>1)</sup> Lead	Pb %	5.77
<sup>1)</sup> Sulphur	S %	0.037
<sup>1)</sup> Antimony	Sb %	0.12
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.67
<sup>1)</sup> Zinc	Zn %	5.03
<sup>1)</sup> Copper	Cu %	84.0

**End of Report**



### Appendix A

#### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2528-001

Page 1 of 1

Related Castco LRN: 220606-2528

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2528				
Specimen No. :	220525-2377-001				
Sample Description :	DN15 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.079	Within limit
Nickel	Ni	2.0 max.	%	0.16	Within limit
Phosphorus	P	0.10 max.	%	0.015	Within limit
Lead	Pb	4.0 to 6.0	%	5.77	Within limit
Sulfur	S	0.10 max.	%	0.037	Within limit
Antimony	Sb	0.25 max.	%	0.12	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.67	Within limit
Zinc	Zn	4.0 to 6.0	%	5.03	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 : 22-06-2022

Specimen No.: CHEM-220606-2529-001

Page 1 of 2

Castco LRN: 220606-2529

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-001

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2529-001

Page 2 of 2

Castco LRN: 220606-2529

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.043
1) Nickel	Ni %	0.18
1) Phosphorus	P %	0.018
1) Lead	Pb %	5.26
1) Sulphur	S %	0.036
1) Antimony	Sb %	0.10
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.51
1) Zinc	Zn %	5.11
1) Copper	Cu %	84.7

**End of Report**

## Appendix A

## Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2529-001

Page 1 of 1

Related Castco LRN: 220606-2529

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2529				
Specimen No. :	220525-2377-001				
Sample Description :	DN15 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.18	Within limit
Phosphorus	P	0.10 max.	%	0.018	Within limit
Lead	Pb	4.0 to 6.0	%	5.26	Within limit
Sulfur	S	0.10 max.	%	0.036	Within limit
Antimony	Sb	0.25 max.	%	0.10	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.51	Within limit
Zinc	Zn	4.0 to 6.0	%	5.11	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 : 22-06-2022

Specimen No.: CHEM-220606-2530-001

Page 1 of 2

Castco LRN: 220606-2530

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-001

Sample Identification No.: -- / Model no.: 272P / 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: 22-06-2022

Specimen No.: CHEM-220606-2530-001

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Castco LRN: 220606-2530

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.043
1) Nickel	Ni %	0.16
1) Phosphorus	P %	0.012
1) Lead	Pb %	5.75
1) Sulphur	S %	0.041
1) Antimony	Sb %	0.11
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.75
1) Zinc	Zn %	5.54
1) Copper	Cu %	83.5

**End of Report**

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2530-001

Page 1 of 1

Related Castco LRN: 220606-2530

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2530				
Specimen No. :	220525-2377-001				
Sample Description :	DN15 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.16	Within limit
Phosphorus	P	0.10 max.	%	0.012	Within limit
Lead	Pb	4.0 to 6.0	%	5.75	Within limit
Sulfur	S	0.10 max.	%	0.041	Within limit
Antimony	Sb	0.25 max.	%	0.11	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.75	Within limit
Zinc	Zn	4.0 to 6.0	%	5.54	Within limit
Copper	Cu	83.0 to 87.0	%	83.5	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 : 22-06-2022

Specimen No.: CHEM-220606-2531-001

Page 1 of 3

Castco LRN: 220606-2531

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN15 Bronze Gate Valve (Stem)

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

Specimen No. : 220525-2377-001

Sample Identification No.: -- / Model no.: 272P / Origin : Thailand

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

Location of Works : --

**Test Method(s):-**

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

**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 : 22-06-2022

Specimen No.: CHEM-220606-2531-001

Page 2 of 3

Castco LRN: 220606-2531

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 20-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Arsenic	As %	0.061
<sup>1)</sup> Iron	Fe %	<0.024
<sup>1)</sup> Manganese	Mn %	<0.010
<sup>1)</sup> Nickel	Ni %	<0.013
<sup>1)</sup> Lead	Pb %	1.88
<sup>1)</sup> Tin	Sn %	0.13
<sup>1)</sup> Zinc	Zn %	35.7
<sup>1)</sup> Copper	Cu %	62.3

## Test Report

## Chemical Analysis of Copper and Copper Alloy

Date of issue: 22-06-2022

Specimen No.: CHEM-220606-2531-001

Page 3 of 3

Castco LRN: 220606-2531

Laboratory test details

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis	Result
<sup>2)</sup> Others Total %	<0.1

## End of Report

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

### Appendix A

#### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 22-06-2022

Specimen No.: CHEM-220606-2531-001

Page 1 of 1

Related Castco LRN: 220606-2531

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022 to 20-06-2022

Castco LRN:	220606-2531			
Specimen No.:	220525-2377-001			
Sample Description :	DN15 Bronze Gate Valve (Stem)			
Sample Identification No.:	-- / Model no.: 272P / Origin : Thailand			
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 %	1.88		Within limit	
Tin Sn 0.1 max. %	0.13		Exceed limit	
Zinc Zn Remainder %	35.7		Within limit	
Copper Cu 61.0 to 63.0 %	62.3		Within limit	
Others Total 0.2 max. %	<0.1		Within limit	

**Remark(s):**

a. Test results only relate to the specimen tested.

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2532-001

Page 1 of 2

Castco LRN: 220606-2532

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-003

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2532-001

Page 2 of 2

Castco LRN: 220606-2532

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.039
<sup>1)</sup> Nickel	Ni %	0.18
<sup>1)</sup> Phosphorus	P %	0.019
<sup>1)</sup> Lead	Pb %	4.94
<sup>1)</sup> Sulphur	S %	0.035
<sup>1)</sup> Antimony	Sb %	0.046
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.51
<sup>1)</sup> Zinc	Zn %	5.45
<sup>1)</sup> Copper	Cu %	84.7

**End of Report**



### Appendix A

#### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2532-001

Page 1 of 1

Related Castco LRN: 220606-2532

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2532				
Specimen No. :	220525-2377-003				
Sample Description :	DN25 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.039	Within limit
Nickel	Ni	2.0 max.	%	0.18	Within limit
Phosphorus	P	0.10 max.	%	0.019	Within limit
Lead	Pb	4.0 to 6.0	%	4.94	Within limit
Sulfur	S	0.10 max.	%	0.035	Within limit
Antimony	Sb	0.25 max.	%	0.046	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.51	Within limit
Zinc	Zn	4.0 to 6.0	%	5.45	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 : 22-06-2022

Specimen No.: CHEM-220606-2533-001

Page 1 of 2

Castco LRN: 220606-2533

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-003

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2533-001

Page 2 of 2

Castco LRN: 220606-2533

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.033
<sup>1)</sup> Nickel	Ni %	0.17
<sup>1)</sup> Phosphorus	P %	0.019
<sup>1)</sup> Lead	Pb %	5.36
<sup>1)</sup> Sulphur	S %	0.035
<sup>1)</sup> Antimony	Sb %	0.067
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.30
<sup>1)</sup> Zinc	Zn %	5.65
<sup>1)</sup> Copper	Cu %	84.3

**End of Report**

## Appendix A

## Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2533-001

Page 1 of 1

Related Castco LRN: 220606-2533

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2533				
Specimen No. :	220525-2377-003				
Sample Description :	DN25 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.033	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.019	Within limit
Lead	Pb	4.0 to 6.0	%	5.36	Within limit
Sulfur	S	0.10 max.	%	0.035	Within limit
Antimony	Sb	0.25 max.	%	0.067	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.30	Within limit
Zinc	Zn	4.0 to 6.0	%	5.65	Within limit
Copper	Cu	83.0 to 87.0	%	84.3	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 : 22-06-2022

Specimen No.: CHEM-220606-2534-001

Page 1 of 2

Castco LRN: 220606-2534

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-003

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2534-001

Page 2 of 2

Castco LRN: 220606-2534

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.063
<sup>1)</sup> Nickel	Ni %	0.19
<sup>1)</sup> Phosphorus	P %	0.019
<sup>1)</sup> Lead	Pb %	5.14
<sup>1)</sup> Sulphur	S %	0.039
<sup>1)</sup> Antimony	Sb %	0.043
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.16
<sup>1)</sup> Zinc	Zn %	5.73
<sup>1)</sup> Copper	Cu %	84.5

**End of Report**

### Appendix A

#### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2534-001

Page 1 of 1

Related Castco LRN: 220606-2534

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2534				
Specimen No. :	220525-2377-003				
Sample Description :	DN25 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.063	Within limit
Nickel	Ni	2.0 max.	%	0.19	Within limit.
Phosphorus	P	0.10 max.	%	0.019	Within limit
Lead	Pb	4.0 to 6.0	%	5.14	Within limit
Sulfur	S	0.10 max.	%	0.039	Within limit
Antimony	Sb	0.25 max.	%	0.043	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.16	Within limit
Zinc	Zn	4.0 to 6.0	%	5.73	Within limit
Copper	Cu	83.0 to 87.0	%	84.5	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 : 22-06-2022

Specimen No.: CHEM-220606-2535-001

Page 1 of 3

Castco LRN: 220606-2535

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN25 Bronze Gate Valve (Stem)

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

Specimen No. : 220525-2377-003

Sample Identification No.: -- / Model no.: 272P / Origin : Thailand

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

Location of Works : --

**Test Method(s):-**

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

**Remark(s):**

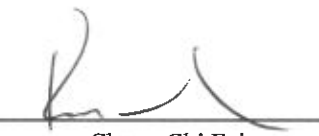
I. Test results only relate to the specimen tested.

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 : 22-06-2022

Specimen No.: CHEM-220606-2535-001

Page 2 of 3

Castco LRN: 220606-2535

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 20-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Arsenic	As %	0.064
1) Iron	Fe %	<0.024
1) Manganese	Mn %	<0.010
1) Nickel	Ni %	<0.013
1) Lead	Pb %	2.03
1) Tin	Sn %	0.010
1) Zinc	Zn %	35.6
1) Copper	Cu %	62.3

## Test Report

## Chemical Analysis of Copper and Copper Alloy

Date of issue: 22-06-2022

Specimen No.: CHEM-220606-2535-001

Page 3 of 3

Castco LRN: 220606-2535

Laboratory test details

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis	Result
<sup>2)</sup> Others Total %	<0.1

End of Report

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



## Appendix A

### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 22-06-2022

Specimen No.: CHEM-220606-2535-001

Page 1 of 1

Related Castco LRN: 220606-2535

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022 to 20-06-2022

Castco LRN:	220606-2535				
Specimen No.:	220525-2377-003				
Sample Description :	DN25 Bronze Gate Valve (Stem)				
Sample Identification No.:	-- / Model no.: 272P / Origin : Thailand				
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	%	0.064	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	%	2.03	Within limit
Tin	Sn	0.1 max.	%	0.010	Within limit
Zinc	Zn	Remainder	%	35.6	Within limit
Copper	Cu	61.0 to 63.0	%	62.3	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 : 22-06-2022

Specimen No.: CHEM-220606-2536-001

Page 1 of 2

Castco LRN: 220606-2536

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN40 Bronze Gate Valve (Body)

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

Specimen No. : 220525-2377-005

Sample Identification No.: -- / Model no.: 272P / 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 Hiui Yat

Assistant Technical Manager

Approved Signatory :



Cheng Chi Fai

Senior Manager

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2536-001

Page 2 of 2

Castco LRN: 220606-2536

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period:

16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.030
<sup>1)</sup> Nickel	Ni %	0.17
<sup>1)</sup> Phosphorus	P %	0.024
<sup>1)</sup> Lead	Pb %	4.83
<sup>1)</sup> Sulphur	S %	0.029
<sup>1)</sup> Antimony	Sb %	0.045
<sup>1)</sup> Silicon	Si %	0.002
<sup>1)</sup> Tin	Sn %	4.48
<sup>1)</sup> Zinc	Zn %	5.57
<sup>1)</sup> Copper	Cu %	84.8

**End of Report**

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2536-001

Page 1 of 1

Related Castco LRN: 220606-2536

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2536				
Specimen No. :	220525-2377-005				
Sample Description :	DN40 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.030	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.024	Within limit
Lead	Pb	4.0 to 6.0	%	4.83	Within limit
Sulfur	S	0.10 max.	%	0.029	Within limit
Antimony	Sb	0.25 max.	%	0.045	Within limit
Silicon	Si	0.01 max.	%	0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.48	Within limit
Zinc	Zn	4.0 to 6.0	%	5.57	Within limit
Copper	Cu	83.0 to 87.0	%	84.8	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 : 22-06-2022

Specimen No.: CHEM-220606-2537-001

Page 1 of 2

Castco LRN: 220606-2537

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN40 Bronze Gate Valve (Bonnet)

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

Specimen No. : 220525-2377-005

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2537-001

Page 2 of 2

Castco LRN: 220606-2537

#### Laboratory test details

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.046
<sup>1)</sup> Nickel	Ni %	0.18
<sup>1)</sup> Phosphorus	P %	0.020
<sup>1)</sup> Lead	Pb %	5.09
<sup>1)</sup> Sulphur	S %	0.030
<sup>1)</sup> Antimony	Sb %	0.051
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.35
<sup>1)</sup> Zinc	Zn %	5.21
<sup>1)</sup> Copper	Cu %	84.9

**End of Report**

## Appendix A

## Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2537-001

Page 1 of 1

Related Castco LRN: 220606-2537

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2537				
Specimen No. :	220525-2377-005				
Sample Description :	DN40 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.046	Within limit
Nickel	Ni	2.0 max.	%	0.18	Within limit
Phosphorus	P	0.10 max.	%	0.020	Within limit
Lead	Pb	4.0 to 6.0	%	5.09	Within limit
Sulfur	S	0.10 max.	%	0.030	Within limit
Antimony	Sb	0.25 max.	%	0.051	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.35	Within limit
Zinc	Zn	4.0 to 6.0	%	5.21	Within limit
Copper	Cu	83.0 to 87.0	%	84.9	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 : 22-06-2022

Specimen No.: CHEM-220606-2538-001

Page 1 of 2

Castco LRN: 220606-2538

#### 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. 272P, bronze gate valve to PN16, screw end  
Contract No. : --  
Customer's Ref. No. : --

#### Sample details as supplied by customer

Date Sampled : --  
Sample Description : DN40 Bronze Gate Valve (Seat)  
Specification : BS EN 1982:2008, Table 23b, Grade CC491K  
Specimen No. : 220525-2377-005  
Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2538-001

Page 2 of 2

Castco LRN: 220606-2538

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.059
1) Nickel	Ni %	0.16
1) Phosphorus	P %	0.018
1) Lead	Pb %	5.03
1) Sulphur	S %	0.032
1) Antimony	Sb %	0.058
1) Silicon	Si %	0.002
1) Tin	Sn %	4.16
1) Zinc	Zn %	5.43
1) Copper	Cu %	85.0

**End of Report**

## Appendix A

## Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2538-001

Page 1 of 1

Related Castco LRN: 220606-2538

Name of Customer: Gate Way Valve & Fitting Limited  
 Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end  
 Contract No.: --  
 Customer's Ref. No.: --  
 Date of Received by Lab.: 06-06-2022 Testing Period: 16-06-2022

Castco LRN:	220606-2538				
Specimen No. :	220525-2377-005				
Sample Description :	DN40 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.059	Within limit
Nickel	Ni	2.0 max.	%	0.16	Within limit
Phosphorus	P	0.10 max.	%	0.018	Within limit
Lead	Pb	4.0 to 6.0	%	5.03	Within limit
Sulfur	S	0.10 max.	%	0.032	Within limit
Antimony	Sb	0.25 max.	%	0.058	Within limit
Silicon	Si	0.01 max.	%	0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.16	Within limit
Zinc	Zn	4.0 to 6.0	%	5.43	Within limit
Copper	Cu	83.0 to 87.0	%	85.0	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 : 22-06-2022

Specimen No.: CHEM-220606-2539-001

Page 1 of 3

Castco LRN: 220606-2539

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN40 Bronze Gate Valve (Stem)

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

Specimen No. : 220525-2377-005

Sample Identification No.: -- / Model no.: 272P / Origin : Thailand

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

Location of Works : --

**Test Method(s):-**

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

**Remark(s):**

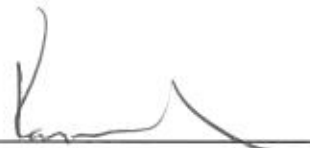
- I. Test results only relate to the specimen tested.

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: 22-06-2022

Specimen No.: CHEM-220606-2539-001

Page 2 of 3

Castco LRN: 220606-2539

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 20-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Arsenic	As %	0.060
1) Iron	Fe %	<0.024
1) Manganese	Mn %	<0.010
1) Nickel	Ni %	<0.013
1) Lead	Pb %	1.94
1) Tin	Sn %	0.013
1) Zinc	Zn %	36.2
1) Copper	Cu %	61.8

**Test Report**

**Chemical Analysis of Copper and Copper Alloy**

Date of issue: 22-06-2022  
Page 3 of 3

Specimen No.: CHEM-220606-2539-001  
Castco LRN: 220606-2539

Laboratory test details

Date of Request Confirmed: 06-06-2022  
Testing Period: 16-06-2022

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

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: 22-06-2022

Specimen No.: CHEM-220606-2539-001

Page 1 of 1

Related Castco LRN: 220606-2539

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022 to 20-06-2022

Castco LRN:	220606-2539				
Specimen No.:	220525-2377-005				
Sample Description :	DN40 Bronze Gate Valve (Stem)				
Sample Identification No.:	-- / Model no.: 272P / Origin : Thailand				
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	%	0.060	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	%	1.94	Within limit
Tin	Sn	0.1 max.	%	0.013	Within limit
Zinc	Zn	Remainder	%	36.2	Within limit
Copper	Cu	61.0 to 63.0	%	61.8	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 : 22-06-2022

Specimen No.: CHEM-220606-2540-001

Page 1 of 2

Castco LRN: 220606-2540

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-006

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2540-001

Page 2 of 2

Castco LRN: 220606-2540

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.046
<sup>1)</sup> Nickel	Ni %	0.17
<sup>1)</sup> Phosphorus	P %	0.023
<sup>1)</sup> Lead	Pb %	5.08
<sup>1)</sup> Sulphur	S %	0.033
<sup>1)</sup> Antimony	Sb %	0.043
<sup>1)</sup> Silicon	Si %	0.002
<sup>1)</sup> Tin	Sn %	4.23
<sup>1)</sup> Zinc	Zn %	5.61
<sup>1)</sup> Copper	Cu %	84.7

**End of Report**

### Appendix A

#### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2540-001

Page 1 of 1

Related Castco LRN: 220606-2540

**Name of Customer:** Gate Way Valve & Fitting Limited  
**Job Title:** WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end  
**Contract No.:** --  
**Customer's Ref. No.:** --  
**Date of Received by Lab.:** 06-06-2022 **Testing Period:** 16-06-2022

Castco LRN:	220606-2540				
Specimen No. :	220525-2377-006				
Sample Description :	DN50 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.046	Within limit
Nickel	Ni	2.0 max.	%	0.17	Within limit
Phosphorus	P	0.10 max.	%	0.023	Within limit
Lead	Pb	4.0 to 6.0	%	5.08	Within limit
Sulfur	S	0.10 max.	%	0.033	Within limit
Antimony	Sb	0.25 max.	%	0.043	Within limit
Silicon	Si	0.01 max.	%	0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.23	Within limit
Zinc	Zn	4.0 to 6.0	%	5.61	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 : 22-06-2022

Specimen No.: CHEM-220606-2541-001

Page 1 of 2

Castco LRN: 220606-2541

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-006

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2541-001

Page 2 of 2

Castco LRN: 220606-2541

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.019
1) Nickel	Ni %	0.15
1) Phosphorus	P %	0.014
1) Lead	Pb %	4.92
1) Sulphur	S %	0.029
1) Antimony	Sb %	0.041
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.92
1) Zinc	Zn %	5.35
1) Copper	Cu %	84.5

**End of Report**

## Appendix A

### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2541-001

Page 1 of 1

Related Castco LRN: 220606-2541

Name of Customer: Gate Way Valve & Fitting Limited  
Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end  
Contract No.: --  
Customer's Ref. No.: --  
Date of Received by Lab.: 06-06-2022 Testing Period: 16-06-2022

Castco LRN:	220606-2541	
Specimen No. :	220525-2377-006	
Sample Description :	DN50 Bronze Gate Valve (Bonnet)	
Sample Identification No.:	-- / Model no.: 272P / 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. %	0.019	Within limit
Nickel Ni 2.0 max. %	0.15	Within limit
Phosphorus P 0.10 max. %	0.014	Within limit
Lead Pb 4.0 to 6.0 %	4.92	Within limit
Sulfur S 0.10 max. %	0.029	Within limit
Antimony Sb 0.25 max. %	0.041	Within limit
Silicon Si 0.01 max. %	<0.002	Within limit
Tin Sn 4.0 to 6.0 %	4.92	Within limit
Zinc Zn 4.0 to 6.0 %	5.35	Within limit
Copper Cu 83.0 to 87.0 %	84.5	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 : 22-06-2022

Specimen No.: CHEM-220606-2542-001

Page 1 of 2

Castco LRN: 220606-2542

**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. 272P, bronze gate valve to PN16, screw end  
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. : 220525-2377-006  
Sample Identification No.: -- / Model no.: 272P / 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):**

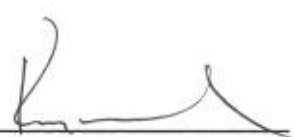
I. Test results only relate to the specimen tested.

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: 22-06-2022

Specimen No.: CHEM-220606-2542-001

Page 2 of 2

Castco LRN: 220606-2542

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.038
<sup>1)</sup> Nickel	Ni %	0.16
<sup>1)</sup> Phosphorus	P %	0.011
<sup>1)</sup> Lead	Pb %	4.82
<sup>1)</sup> Sulphur	S %	0.039
<sup>1)</sup> Antimony	Sb %	0.048
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.23
<sup>1)</sup> Zinc	Zn %	5.10
<sup>1)</sup> Copper	Cu %	85.5

**End of Report**

### Appendix A

#### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2542-001

Page 1 of 1

Related Castco LRN: 220606-2542

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2542				
Specimen No. :	220525-2377-006				
Sample Description :	DN50 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.038	Within limit
Nickel	Ni	2.0 max.	%	0.16	Within limit
Phosphorus	P	0.10 max.	%	0.011	Within limit
Lead	Pb	4.0 to 6.0	%	4.82	Within limit
Sulfur	S	0.10 max.	%	0.039	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	%	4.23	Within limit
Zinc	Zn	4.0 to 6.0	%	5.10	Within limit
Copper	Cu	83.0 to 87.0	%	85.5	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 : 22-06-2022  
Page 1 of 3Specimen No.: CHEM-220606-2543-001  
Castco LRN: 220606-2543**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN50 Bronze Gate Valve (Stem)

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

Specimen No. : 220525-2377-006

Sample Identification No.: -- / Model no.: 272P / Origin : Thailand

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

Location of Works : --

**Test Method(s):-**

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

**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: 22-06-2022

Specimen No.: CHEM-220606-2543-001

Page 2 of 3

Castco LRN: 220606-2543

Laboratory test details

Date of Request Confirmed: 06-06-2022

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

Testing Period: 20-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Arsenic	As %	0.064
<sup>1)</sup> Iron	Fe %	<0.024
<sup>1)</sup> Manganese	Mn %	<0.010
<sup>1)</sup> Nickel	Ni %	<0.013
<sup>1)</sup> Lead	Pb %	1.82
<sup>1)</sup> Tin	Sn %	0.015
<sup>1)</sup> Zinc	Zn %	36.6
<sup>1)</sup> Copper	Cu %	61.5

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

Date of issue: 22-06-2022

Page 3 of 3

Specimen No.: CHEM-220606-2543-001

Castco LRN: 220606-2543

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis	Result
<sup>2)</sup> Others Total %	<0.1

**End of Report**

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

## Appendix A

### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 22-06-2022

Specimen No.: CHEM-220606-2543-001

Page 1 of 1

Related Castco LRN: 220606-2543

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022 to 20-06-2022

Castco LRN:	220606-2543				
Specimen No.:	220525-2377-006				
Sample Description :	DN50 Bronze Gate Valve (Stem)				
Sample Identification No.:	-- / Model no.: 272P / Origin : Thailand				
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	%	0.064	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	%	1.82	Within limit
Tin	Sn	0.1 max.	%	0.015	Within limit
Zinc	Zn	Remainder	%	36.6	Within limit
Copper	Cu	61.0 to 63.0	%	61.5	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.



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## Test Report

### Chemical Analysis of Copper and Copper Alloy

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2544-001

Page 1 of 2

Castco LRN: 220606-2544

#### 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. 272P, bronze gate valve to PN16, screw end  
Contract No. : --  
Customer's Ref. No. : --

#### Sample details as supplied by customer

Date Sampled : --  
Sample Description : DN80 Bronze Gate Valve (Body)  
Specification : BS EN 1982:2008, Table 23b, Grade CC491K  
Specimen No. : 220525-2377-008  
Sample Identification No.: -- / Model no.: 272P / 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: 22-06-2022

Specimen No.: CHEM-220606-2544-001

Page 2 of 2

Castco LRN: 220606-2544

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.029
<sup>1)</sup> Nickel	Ni %	0.22
<sup>1)</sup> Phosphorus	P %	0.024
<sup>1)</sup> Lead	Pb %	4.79
<sup>1)</sup> Sulphur	S %	0.034
<sup>1)</sup> Antimony	Sb %	0.047
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.58
<sup>1)</sup> Zinc	Zn %	5.05
<sup>1)</sup> Copper	Cu %	85.1

**End of Report**



**Appendix A**

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2544-001

Page 1 of 1

Related Castco LRN: 220606-2544

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2544				
Specimen No. :	220525-2377-008				
Sample Description :	DN80 Bronze Gate Valve (Body)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.029	Within limit
Nickel	Ni	2.0 max.	%	0.22	Within limit
Phosphorus	P	0.10 max.	%	0.024	Within limit
Lead	Pb	4.0 to 6.0	%	4.79	Within limit
Sulfur	S	0.10 max.	%	0.034	Within limit
Antimony	Sb	0.25 max.	%	0.047	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.58	Within limit
Zinc	Zn	4.0 to 6.0	%	5.05	Within limit
Copper	Cu	83.0 to 87.0	%	85.1	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 : 22-06-2022

Specimen No.: CHEM-220606-2545-001

Page 1 of 2

Castco LRN: 220606-2545

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN80 Bronze Gate Valve (Bonnet)

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

Specimen No. : 220525-2377-008

Sample Identification No.: -- / Model no.: 272P / 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 : 22-06-2022

Specimen No.: CHEM-220606-2545-001

Page 2 of 2

Castco LRN: 220606-2545

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period:

16-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Iron	Fe %	0.025
1) Nickel	Ni %	0.18
1) Phosphorus	P %	0.024
1) Lead	Pb %	5.53
1) Sulphur	S %	0.019
1) Antimony	Sb %	0.046
1) Silicon	Si %	<0.002
1) Tin	Sn %	4.62
1) Zinc	Zn %	4.77
1) Copper	Cu %	84.7

**End of Report**

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2545-001

Page 1 of 1

Related Castco LRN: 220606-2545

Name of Customer: Gate Way Valve & Fitting Limited  
 Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end  
 Contract No.: --  
 Customer's Ref. No.: --  
 Date of Received by Lab.: 06-06-2022 Testing Period: 16-06-2022

Castco LRN:	220606-2545				
Specimen No. :	220525-2377-008				
Sample Description :	DN80 Bronze Gate Valve (Bonnet)				
Sample Identification No.:	-- / Model no.: 272P / Origin : Thailand				
Manufacturer :	Kitz (Thailand) Ltd. / Brand name : Toyo				
Specification: BS EN 1982:2008, Table 23b, Grade CC491K				<b>Test Results</b>	<b>Within / Exceed limit</b>
Aluminium	Al	0.01 max.	%	<0.003	Within limit
Iron	Fe	0.3 max.	%	0.025	Within limit
Nickel	Ni	2.0 max.	%	0.18	Within limit
Phosphorus	P	0.10 max.	%	0.024	Within limit
Lead	Pb	4.0 to 6.0	%	5.53	Within limit
Sulfur	S	0.10 max.	%	0.019	Within limit
Antimony	Sb	0.25 max.	%	0.046	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	%	4.77	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 : 22-06-2022

Specimen No.: CHEM-220606-2546-001

Page 1 of 2

Castco LRN: 220606-2546

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN80 Bronze Gate Valve (Seat)

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

Specimen No. : 220525-2377-008

Sample Identification No.: -- / Model no.: 272P / 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: 22-06-2022

Specimen No.: CHEM-220606-2546-001

Page 2 of 2

Castco LRN: 220606-2546

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Iron	Fe %	0.052
<sup>1)</sup> Nickel	Ni %	0.16
<sup>1)</sup> Phosphorus	P %	0.024
<sup>1)</sup> Lead	Pb %	4.97
<sup>1)</sup> Sulphur	S %	0.026
<sup>1)</sup> Antimony	Sb %	0.036
<sup>1)</sup> Silicon	Si %	<0.002
<sup>1)</sup> Tin	Sn %	4.53
<sup>1)</sup> Zinc	Zn %	5.07
<sup>1)</sup> Copper	Cu %	85.1

**End of Report**

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

Date of issue : 22-06-2022

Specimen No.: CHEM-220606-2546-001

Page 1 of 1

Related Castco LRN: 220606-2546

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022

Castco LRN:	220606-2546				
Specimen No. :	220525-2377-008				
Sample Description :	DN80 Bronze Gate Valve (Seat)				
Sample Identification No.:	-- / Model no.: 272P / 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.	%	0.052	Within limit
Nickel	Ni	2.0 max.	%	0.16	Within limit
Phosphorus	P	0.10 max.	%	0.024	Within limit
Lead	Pb	4.0 to 6.0	%	4.97	Within limit
Sulfur	S	0.10 max.	%	0.026	Within limit
Antimony	Sb	0.25 max.	%	0.036	Within limit
Silicon	Si	0.01 max.	%	<0.002	Within limit
Tin	Sn	4.0 to 6.0	%	4.53	Within limit
Zinc	Zn	4.0 to 6.0	%	5.07	Within limit
Copper	Cu	83.0 to 87.0	%	85.1	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 : 22-06-2022

Specimen No.: CHEM-220606-2547-001

Page 1 of 3

Castco LRN: 220606-2547

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : --

Sample Description : DN80 Bronze Gate Valve (Stem)

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

Specimen No. : 220525-2377-008

Sample Identification No.: -- / Model no.: 272P / Origin : Thailand

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

Location of Works : --

**Test Method(s):-**

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

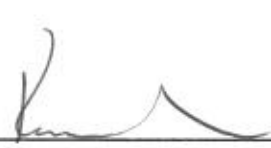
**Remark(s):**

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 : 22-06-2022

Specimen No.: CHEM-220606-2547-001

Page 2 of 3

Castco LRN: 220606-2547

**Laboratory test details**

Date of Request Confirmed: 06-06-2022

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

Testing Period: 20-06-2022

Chemical Analysis		Result
1) Aluminium	Al %	<0.003
1) Arsenic	As %	<0.022
1) Iron	Fe %	0.043
1) Manganese	Mn %	<0.010
1) Nickel	Ni %	0.060
1) Lead	Pb %	2.76
1) Tin	Sn %	0.20
1) Zinc	Zn %	35.5
1) Copper	Cu %	61.3

### Test Report

#### Chemical Analysis of Copper and Copper Alloy

Date of issue: 22-06-2022

Page 3 of 3

Specimen No.: CHEM-220606-2547-001

Castco LRN: 220606-2547

Laboratory test details

Date of Request Confirmed: 06-06-2022

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

Testing Period: 16-06-2022

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: 22-06-2022

Specimen No.: CHEM-220606-2547-001

Page 1 of 1

Related Castco LRN: 220606-2547

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

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

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

Testing Period: 16-06-2022 to 20-06-2022

Castco LRN:	220606-2547			
Specimen No.:	220525-2377-008			
Sample Description :	DN80 Bronze Gate Valve (Stem)			
Sample Identification No.:	-- / Model no.: 272P / Origin : Thailand			
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 %	<0.022		NA	
Iron Fe 0.1 max. %	0.043		Within limit	
Manganese Mn 0.1 max. %	<0.010		Within limit	
Nickel Ni 0.3 max. %	0.060		Within limit	
Lead Pb 1.7 to 2.8 %	2.76		Within limit	
Tin Sn 0.1 max. %	0.20		Exceed limit	
Zinc Zn Remainder %	35.5		Within limit	
Copper Cu 61.0 to 63.0 %	61.3		Within limit	
Others Total 0.2 max. %	<0.1		Within limit	

**Remark(s):**

a. Test results only relate to the specimen tested.

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

Date of issue: 02-08-2022

Specimen No.: CHEM-220725-2047-001

Page 1 of 3

Castco LRN: 220725-2047

**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. 272P, bronze gate valve to PN16, screw end

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. : 220525-2377-001

Sample Identification No.: -- / Model no.: 272P

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:**

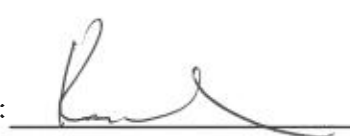
I. Test results only relate to the specimen tested.

Checked by :

  
Lau Hiu Yat

Assistant Technical Manager

Approved Signatory :

  
Cheng Chi Fai

Senior Manager



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## Test Report

### Chemical Analysis of Copper and Copper Alloy

Date of issue: 02-08-2022

Specimen No.: CHEM-220725-2047-001

Page 2 of 3

Castco LRN: 220725-2047

#### Laboratory test details

Date of Request Confirmed: 25-07-2022

Date of Received by Lab.: 25-07-2022

Testing Period:

29-07-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Arsenic	As %	0.061
<sup>1)</sup> Iron	Fe %	0.024
<sup>1)</sup> Manganese	Mn %	<0.010
<sup>1)</sup> Nickel	Ni %	<0.013
<sup>1)</sup> Lead	Pb %	2.04
<sup>1)</sup> Tin	Sn %	0.029
<sup>1)</sup> Zinc	Zn %	36.0
<sup>1)</sup> Copper	Cu %	61.8

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

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

Date of issue: 02-08-2022

Specimen No.: CHEM-220725-2047-001

Page 3 of 3

Castco LRN: 220725-2047

**Laboratory test details**

Date of Request Confirmed: 25-07-2022

Date of Received by Lab.: 25-07-2022

Testing Period: 29-07-2022

Chemical Analysis	Result
<sup>2)</sup> Others Total %	<0.1

**End of Report**

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



## Appendix A

## Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 02-08-2022

Specimen No.: CHEM-220725-2047-001

Page 1 of 1

Related Castco LRN: 220725-2047

Name of Customer: Gate Way Valve & Fitting Limited  
 Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end  
 Contract No.: --  
 Customer's Ref. No.: --  
 Date of Received by Lab.: 25-07-2022      Testing Period: 29-07-2022

Castco LRN:	220725-2047				
Specimen No.:	220525-2377-001				
Date Sampled :	-- / Origin : Thailand				
Sample Description :	DN15 Bronze Gate Valve (Stem)				
Sample Identification No.:	-- / Model no.: 272P				
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	%	2.04	Within limit
Tin	Sn	0.1 max.	%	0.029	Within limit
Zinc	Zn	Remainder	%	36.0	Within limit
Copper	Cu	61.0 to 63.0	%	61.8	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: 02-08-2022

Specimen No.: CHEM-220725-2048-001

Page 1 of 3

Castco LRN: 220725-2048

**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. 272P, bronze gate valve to PN16, screw end

Contract No. : --

Customer's Ref. No. : --

**Sample details as supplied by customer**

Date Sampled : -- / Origin : Thailand

Sample Description : DN80 Bronze Gate Valve (Stem)

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

Specimen No. : 220525-2377-008

Sample Identification No.: -- / Model no.: 272P

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: 02-08-2022

Specimen No.: CHEM-220725-2048-001

Page 2 of 3

Castco LRN: 220725-2048

**Laboratory test details**

Date of Request Confirmed: 25-07-2022

Date of Received by Lab.: 25-07-2022

Testing Period:

29-07-2022

Chemical Analysis		Result
<sup>1)</sup> Aluminium	Al %	<0.003
<sup>1)</sup> Arsenic	As %	0.069
<sup>1)</sup> Iron	Fe %	<0.024
<sup>1)</sup> Manganese	Mn %	<0.010
<sup>1)</sup> Nickel	Ni %	<0.013
<sup>1)</sup> Lead	Pb %	1.95
<sup>1)</sup> Tin	Sn %	0.025
<sup>1)</sup> Zinc	Zn %	36.3
<sup>1)</sup> Copper	Cu %	61.6

**Test Report****Chemical Analysis of Copper and Copper Alloy**Date of issue: 02-08-2022  
Page 3 of 3Specimen No.: CHEM-220725-2048-001  
Castco LRN: 220725-2048**Laboratory test details**

Date of Request Confirmed: 25-07-2022

Date of Received by Lab.: 25-07-2022

Testing Period: 29-07-2022

Chemical Analysis	Result
<sup>2)</sup> Others Total %	0.1

**End of Report**

Form No.: CHM Cu&amp;Cu Alloy-3 T id 03/02/2016

## Appendix A

### Summary of Chemical Analysis of Copper and Copper Alloy

Date of issue: 02-08-2022

Specimen No.: CHEM-220725-2048-001

Page 1 of 1

Related Castco LRN: 220725-2048

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of Toyo Fig. 272P, bronze gate valve to PN16, screw end

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 25-07-2022

Testing Period: 29-07-2022

Castco LRN:	220725-2048				
Specimen No.:	220525-2377-008				
Date Sampled :	-- / Origin : Thailand				
Sample Description :	DN80 Bronze Gate Valve (Stem)				
Sample Identification No.:	-- / Model no.: 272P				
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	%	0.069	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	%	1.95	Within limit
Tin	Sn	0.1 max.	%	0.025	Within limit
Zinc	Zn	Remainder	%	36.3	Within limit
Copper	Cu	61.0 to 63.0	%	61.6	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.