

Summary of Test Results

Reference no. : BC-SUMMARY-2021-021

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 : Copper Alloy Check Valve

Nominal pressure (PN) : 16

Manufacturer : JCH A/S

Brand name : AVK

Body marking : ©∇α JCH-(Inch) - ∇ CR

Model no. : JCH90 Type 2190

Origin : Denmark

Sample submitted by : Gate Way Valve & Fitting Ltd.

Test standard : BS 5154 : 1991 / BS EN 12165 : 2016

Test period : 06 to 19 January 2021

A) Sample List

DN (mm)	Inch	Specimen no.
15	1/2"	201228-2139-001
20	3/4"	201228-2139-002
25	1"	201228-2139-003
32	1-1/4"	201228-2139-004
40	1-1/2"	201228-2139-005
50	2"	201228-2139-006

B) Test Item**1) Dimensions Check (BS 5154 : 1991 Clause 8)**

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	201228-2139
20	3/4"	Passed	
25	1"	Passed	
32	1-1/4"	Passed	
40	1-1/2"	Passed	
50	2"	Passed	

2) Pressure Test (BS 5154 : 1991 Clause 11)

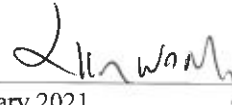
DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	201228-2139
20	3/4"	Passed	
25	1"	Passed	
32	1-1/4"	Passed	
40	1-1/2"	Passed	
50	2"	Passed	

Summary of Test Results

Reference no. : BC-SUMMARY-2021-021

B) Test Item (con't)**3) Chemical Composition (Body) (BS EN 12165 : 2016 Table 7 Grade CW625N)**

DN (mm)	Inch	Test results	Castco LRN
15	1/2"	Passed	210107-2577
25	1"	Passed	210107-2578
50	2"	Passed	210107-2579

Prepare by : _____
Date : 29 January 2021**FU HO MAN**
Assistant Technical ManagerReview by : _____
Date : 29 January 2021**WONG KA MAN**
Senior Manager

Test Report**Copper Alloy Check Valves - Dimensions**(In-house method VAL-COPPER-DIM-BS5154 in conjunction with the following specification(s) :
BS 5154 : 1991 Clause 8)

Date of issue : 29 January 2021

Page 1 of 7 page(s)

Castco LRN : 201228-2139

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 AVK JCH90 Check Valve

Sample description : Copper Alloy Check Valve

Nominal pressure (PN) : 16

Manufacturer : JCH A/S

Brand name : AVK

Body marking :  JCH-(Inch) -  CR

Model no. : JCH90 Type 2190

Origin : Denmark

Sample submitted by : Gate Way Valve & Fitting Ltd.

Laboratory test results

Date of sample received : 23 December 2020

Date of test : 06 January 2021

Specimen no.	201228-2139-001	201228-2139-002	201228-2139-003	201228-2139-004	201228-2139-005	201228-2139-006	
DN (mm)	15	20	25	32	40	50	
Inch	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	
Wall thickness of body (mm)	Measured mean value	3.91	2.69	2.62	4.28	3.51	3.00
	BS 5154 : 1991 requirement	min. 1.7	min. 1.8	min. 2.0	min. 2.2	min. 2.3	min. 2.5
NV (mm)	Measured mean value	21.95	23.95	29.96	36.09	46.04	55.00
	Manufacturer requirement	22	24	30	36	46	55
L (mm)	Measured mean value	22	28	33	38	45	57
	Manufacturer requirement	23	28	32	38	45	57

Test Report

Copper Alloy Check Valves - Dimensions

(In-house method VAL-COPPER-DIM-BS5154 in conjunction with the following specification(s) :
BS 5154 : 1991 Clause 8)

Date of issue : 29 January 2021

Page 2 of 7 page(s)

Castco LRN : 201228-2139

Laboratory test results (con't)

Specimen no.		201228-2139-001	201228-2139-002	201228-2139-003	201228-2139-004	201228-2139-005	201228-2139-006
DN (mm)		15	20	25	32	40	50
Inch		1/2"	3/4"	1"	1-1/4"	1-1/2"	2"
L1 (mm)	Measured mean value	12	13	15	18	18	22
	Manufacturer requirement	11.5	13	16	18	18	22
L2 (mm)	Measured mean value	12	13	16	18	18	22
	Manufacturer requirement	11.5	13	16	18	18	22

Remark(s) :

1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS 5154 : 1991 Table 8 (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. The threaded end connection suit to BS EN 10266-2 (BS 21) Tapper threads.

Checked by : FU HO MAN
Assistant Technical Manager

Approved Signatory : WONG KA MAN
Senior Manager

Test Report**Metallic Valves - Shell and Seat Tightness
(BS EN 12266-1 : 2012 Annex A3 and A4)**

Date of issue : 29 January 2021

Page 3 of 7 page(s)

Castco LRN : 201228-2139

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 AVK JCH90 Check Valve

Sample description : Copper Alloy Check Valve

Nominal pressure (PN) : 16

Manufacturer : JCH A/S

Brand name : AVK

Body marking :  JCH-(Inch) -  CR

Model no. : JCH90 Type 2190

Origin : Denmark

Sample submitted by : Gate Way Valve & Fitting Ltd.

Laboratory test results

Date of sample received : 23 December 2020

Date of test : 06 to 07 January 2021

A) Shell Tightness

Specimen no.	201228-2139-001	201228-2139-002	201228-2139-003	201228-2139-004	201228-2139-005	201228-2139-006
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)	24	24	24	24	24	24
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

Metallic Valves - Shell and Seat Tightness
(BS EN 12266-1 : 2012 Annex A3 and A4)

Date of issue : 29 January 2021

Page 4 of 7 page(s)

Castco LRN : 201228-2139

Laboratory test results (con't)

B) Seat Tightness

Specimen no.	201228-2139-001	201228-2139-002	201228-2139-003	201228-2139-004	201228-2139-005	201228-2139-006
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)	17.6	17.6	17.6	17.6	17.6	17.6
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) :

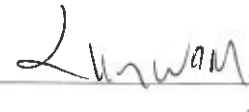
1. Test results relate only to the specimen tested.
2. Test results of sample comply with the requirement of BS 5154 : 1991 Clause 11 (this specification is not covered by the laboratory's HOKLAS accreditation).
3. Effect of measurement uncertainty has not been taken into account.

Checked by :



FU HO MAN
Assistant Technical Manager

Approved Signatory :



WONG KA MAN
Senior Manager

Test Report
Copper Alloy Check Valves - Dimensions
(In-house method VAL-COPPER-DIM-BS5154 in conjunction with the following specification(s) :
BS 5154 : 1991 Clause 8)

Date of issue : 29 January 2021

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Castco LRN : 201228-2139

Appendix A201228-2139-001(1)201228-2139-001(2)201228-2139-002(1)201228-2139-002(2)201228-2139-003(1)201228-2139-003(2)

Test Report
Copper Alloy Check Valves - Dimensions
(In-house method VAL-COPPER-DIM-BS5154 in conjunction with the following specification(s) :
BS 5154 : 1991 Clause 8)

Date of issue : 29 January 2021

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Castco LRN : 201228-2139

Appendix B



201228-2139-004(1)



201228-2139-004(2)



201228-2139-005(1)



201228-2139-005(2)



201228-2139-006(1)



201228-2139-006(2)

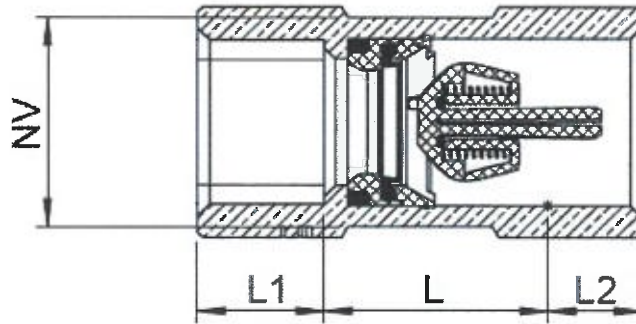
Test Report
Copper Alloy Check Valves - Dimensions
(In-house method VAL-COPPER-DIM-BS5154 in conjunction with the following specification(s) :
BS 5154 : 1991 Clause 8)

Date of issue : 29 January 2021

Page 7 of 7 page(s)

Castco LRN : 201228-2139

Appendix C



Dimensions Figure

End of Report

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

Date of issue : 27-01-2021

Specimen No.: CHEM-210107-2577-001

Page 1 of 3

Castco LRN: 210107-2577

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 AVK JCH90 check valve

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Date of Sample Received : 07-01-2021

Test Period : 19-01-2021

Sample Description : DN15 Copper Alloy Check Valve (Body)

Specification : BS EN 12165:2016, Table 7, Grade CW625N

Specimen No. : 201228-2139-001

Sample Identification No.: -- / Model no.: JCH90 Type 2190 / Origin : Denmark

Manufacturer : JCH A/S / Brand name : AVK

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 : 27-01-2021

Specimen No.: CHEM-210107-2577-001

Page 2 of 3

Castco LRN: 210107-2577

Chemical Analysis		Result
¹⁾ Aluminium	Al %	0.53
¹⁾ Arsenic	As %	0.032
¹⁾ Iron	Fe %	0.078
¹⁾ Manganese	Mn %	<0.010
¹⁾ Nickel	Ni %	0.025
¹⁾ Lead	Pb %	1.28
¹⁾ Tin	Sn %	0.047
¹⁾ Zinc	Zn %	35.2
¹⁾ Copper	Cu %	62.8

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

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

Date of issue : 27-01-2021

Specimen No.: CHEM-210107-2577-001

Page 3 of 3

Castco LRN: 210107-2577

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 : 27-01-2021

Specimen No.: CHEM-210107-2577-001

Page 1 of 1

Related Castco LRN: 210107-2577

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of AVK JCH90 check valve

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 07-01-2021

Testing Period: 19-01-2021

Castco LRN:	210107-2577				
Specimen No. :	201228-2139-001				
Sample Description :	DN15 Copper Alloy Check Valve (Body)				
Sample Identification No.:	-- / Model no.: JCH90 Type 2190 / Origin : Denmark				
Manufacturer :	JCH A/S / Brand name : AVK				
Specification: BS EN 12165:2016, Table 7, Grade CW625N				Test Results	Within / Exceed limit
Aluminium	Al	0.5 to 0.7	%	0.53	Within limit
Arsenic	As	0.02 to 0.15	%	0.032	Within limit
Iron	Fe	0.3 max.	%	0.078	Within limit
Manganese	Mn	0.1 max.	%	<0.010	Within limit
Nickel	Ni	0.2 max.	%	0.025	Within limit
Lead	Pb	1.2 to 1.6	%	1.28	Within limit
Tin	Sn	0.3 max.	%	0.047	Within limit
Zinc	Zn	Remainder	%	35.2	Within limit
Copper	Cu	62.0 to 64.0	%	62.8	Within limit
Others Total		0.2 max.	%	<0.1	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 12165:2016, Table 7, Grade CW625N.

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

Date of issue : 27-01-2021

Page 1 of 3

Specimen No.: CHEM-210107-2578-001

Castco LRN: 210107-2578

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 AVK JCH90 check valve

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Date of Sample Received : 07-01-2021

Test Period : 19-01-2021

Sample Description : DN25 Copper Alloy Check Valve (Body)

Specification : BS EN 12165:2016, Table 7, Grade CW625N

Specimen No. : 201228-2139-003

Sample Identification No.: -- / Model no.: JCH90 Type 2190 / Origin : Denmark

Manufacturer : JCH A/S / Brand name : AVK

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 : 27-01-2021

Specimen No.: CHEM-210107-2578-001

Page 2 of 3

Castco LRN: 210107-2578

Chemical Analysis		Result
¹⁾ Aluminium	Al %	0.52
¹⁾ Arsenic	As %	0.031
¹⁾ Iron	Fe %	0.085
¹⁾ Manganese	Mn %	<0.010
¹⁾ Nickel	Ni %	0.068
¹⁾ Lead	Pb %	1.29
¹⁾ Tin	Sn %	0.067
¹⁾ Zinc	Zn %	35.5
¹⁾ Copper	Cu %	62.5

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

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 27-01-2021
Page 3 of 3Specimen No.: CHEM-210107-2578-001
Castco LRN: 210107-2578

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 : 27-01-2021

Specimen No.: CHEM-210107-2578-001

Page 1 of 1

Related Castco LRN: 210107-2578

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of AVK JCH90 check valve

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 07-01-2021

Testing Period: 19-01-2021

Castco LRN:	210107-2578				
Specimen No. :	201228-2139-003				
Sample Description :	DN25 Copper Alloy Check Valve (Body)				
Sample Identification No.:	-- / Model no.: JCH90 Type 2190 / Origin : Denmark				
Manufacturer :	JCH A/S / Brand name : AVK				
Specification: BS EN 12165:2016, Table 7, Grade CW625N				Test Results	Within / Exceed limit
Aluminium	Al	0.5 to 0.7	%	0.52	Within limit
Arsenic	As	0.02 to 0.15	%	0.031	Within limit
Iron	Fe	0.3 max.	%	0.085	Within limit
Manganese	Mn	0.1 max.	%	<0.010	Within limit
Nickel	Ni	0.2 max.	%	0.068	Within limit
Lead	Pb	1.2 to 1.6	%	1.29	Within limit
Tin	Sn	0.3 max.	%	0.067	Within limit
Zinc	Zn	Remainder	%	35.5	Within limit
Copper	Cu	62.0 to 64.0	%	62.5	Within limit
Others Total		0.2 max.	%	<0.1	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 12165:2016, Table 7, Grade CW625N.

Test Report**Chemical Analysis of Copper and Copper Alloy**Date of issue : 27-01-2021
Page 1 of 3Specimen No.: CHEM-210107-2579-001
Castco LRN: 210107-2579**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 AVK JCH90 check valve

Contract No. : --

Customer's Ref. No. : --

Sample details as supplied by customer

Date Sampled : --

Date of Sample Received : 07-01-2021

Test Period : 19-01-2021

Sample Description : DN50 Copper Alloy Check Valve (Body)

Specification : BS EN 12165:2016, Table 7, Grade CW625N

Specimen No. : 201228-2139-006

Sample Identification No.: -- / Model no.: JCH90 Type 2190 / Origin : Denmark

Manufacturer : JCH A/S / Brand name : AVK

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 : 27-01-2021

Specimen No.: CHEM-210107-2579-001

Page 2 of 3

Castco LRN: 210107-2579

Chemical Analysis		Result
¹⁾ Aluminium	Al %	0.52
¹⁾ Arsenic	As %	0.034
¹⁾ Iron	Fe %	0.089
¹⁾ Manganese	Mn %	<0.010
¹⁾ Nickel	Ni %	0.032
¹⁾ Lead	Pb %	1.28
¹⁾ Tin	Sn %	0.073
¹⁾ Zinc	Zn %	34.7
¹⁾ Copper	Cu %	63.3

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

Date of issue : 27-01-2021

Specimen No.: CHEM-210107-2579-001

Page 3 of 3

Castco LRN: 210107-2579

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 : 27-01-2021

Specimen No.: CHEM-210107-2579-001

Page 1 of 1

Related Castco LRN: 210107-2579

Name of Customer: Gate Way Valve & Fitting Limited

Job Title: WSD GA renew of AVK JCH90 check valve

Contract No.: --

Customer's Ref. No.: --

Date of Received by Lab.: 07-01-2021

Testing Period: 19-01-2021

Castco LRN:	210107-2579				
Specimen No. :	201228-2139-006				
Sample Description :	DN50 Copper Alloy Check Valve (Body)				
Sample Identification No.:	-- / Model no.: JCH90 Type 2190 / Origin : Denmark				
Manufacturer :	JCH A/S / Brand name : AVK				
Specification: BS EN 12165:2016, Table 7, Grade CW625N				Test Results	Within / Exceed limit
Aluminium	Al	0.5 to 0.7	%	0.52	Within limit
Arsenic	As	0.02 to 0.15	%	0.034	Within limit
Iron	Fe	0.3 max.	%	0.089	Within limit
Manganese	Mn	0.1 max.	%	<0.010	Within limit
Nickel	Ni	0.2 max.	%	0.032	Within limit
Lead	Pb	1.2 to 1.6	%	1.28	Within limit
Tin	Sn	0.3 max.	%	0.073	Within limit
Zinc	Zn	Remainder	%	34.7	Within limit
Copper	Cu	62.0 to 64.0	%	63.3	Within limit
Others Total		0.2 max.	%	<0.1	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 12165:2016, Table 7, Grade CW625N.