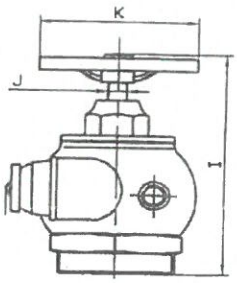
FUGRO TECHNICAL SERVICES LIMITED
Fugro Development Centre
5 Lok Yi Street, Tai Lam
Tuen Mun, NT
Hong Kong

Client Ref. : --
Report No. : 205153PC200277(1)

REPORT ON TESTING OF HYDRANT VALVE

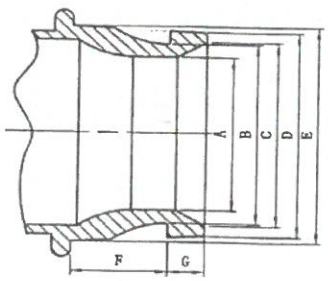
Information Supplied by Client

Client	:	Wah Hung Fire Prevention Equipment Co., Limited
Address	:	G/F, No.129, Tai Nan Street, Prince Edward, Kowloon, Hong Kong
Sample Description	:	80mm Copper alloy twin inlet with integral non-return valve and drain, 2 1/2" BS male instant twin inlet and 3" BSP male thread pipe connection.
Brand	:	WAH HUNG
Country of Origin	:	China
Model	:	WH005
Body Marking	:	104 80
Manufacturer	:	Wah Nan Fire Fighting Equipment Co., Ltd.



Laboratory Information

Lab. Sample I.D.	:	PC200277/2
Date Received	:	21 September 2020, 06 October 2020 & 28 November 2020
Date Test Started	:	21 September 2020
Date Test Completed	:	02 December 2020
Test Method	:	BS 5041: Part 1 : 1987 : BS336 : 2010 , BS EN 1982 : 2008 & BS EN 12164 : 2016



Test Results

1. DIMENSIONS

(Clause 9 Figure 5a of 336 : 2010)

		Sample (mm)	BS Requirement (mm)	Remark
Nominal size (mm)		80	-	--
Diameter of handwheel (K) (mm)		135	-	
Height of valve (I)	fully open (mm)	220	-	
	fully closed (mm)	202	-	
Minimum wall thickness (mm)		4.5	min.3.1 (BS5154 PN16)	Pass
Stem diameter		19.05	min.19 (BS5041)	

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	Results	BS Requirement	Remark
A (mm)	53.0	53±1	Pass
B (mm)	62.0	62±0.1	
C (mm)	63.60	63.5±0.25	
D (mm)	70.45	70.4±0.1	
E (mm)	74.7	74.6±0.1	
F (mm)	30.6	30.5±0.25	
G (mm)	11.3	11.3±0.1	

2. Water Flow Rate and Outlet Pressure Test
(BS5041 part 1 clause 22)

Remarks : There is no relevant BS standard covering wet riser inlet and there is no flow requirement for this type of wet riser inlet

3. Hydraulic pressure test
(BS5041 part 1 clause 19)

	Body Test			Seat Test		
	Test Pressure (bar)	Duration (min)	Remark	Test Pressure (bar)	Duration (min)	Remark
Sample	22.5	2	Pass	16.5	2	Pass
BS Requirement for low pressure valve	22.5	2	-	16.5	2	-

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4. Chemical Composition (Body)

(BS 5041 : Part 1 : 1987 clause 8)

Testing items	Results	Specification according to BS EN 1982 : 2008 Grade CC491K castings
1. Copper (Cu) content, %	86.0	83.0 - 87.0 [1)]
2. Nickel (Ni) content, %	0.28	2.0 max.
3. Phosphorus (P) content, %	<0.03	0.10 max.
4. Lead (Pb) content, %	4.8	4.0 - 6.0
5. Tin (Sn) content, %	4.9	4.0 - 6.0
6. Zinc (Zn) content, %	4.2	4.0 - 6.0
7. Aluminium (Al) content, %	<0.01	0.01 max.
8. Iron (Fe) content, %	<0.04	0.3 max.
9. Sulfur (S) content, %	<0.04	0.10 max.
10. Antimony (Sb) content, %	0.06	0.25 max.
11. Silicon (Si) content, %	<0.01	0.01 max.

Remark : [1)] Include nickel

Note : Based on the test results of the submitted sample, it is found that the sample complies with the chemical composition specification of BS EN 1982 : 2008 Grade CC491K castings

The chemical composition results are obtained from our test report no. 205153EN202858

5. Chemical Composition (Bonnet)

Testing items	Results	Specification according to BS EN 12164 : 2016 Grade CW617N
1. Aluminum (Al) content, %	<0.01	0.05 max.
2. Copper (Cu) content, %	57.5	57.0 – 59.0
3. Nickel (Ni) content, %	<0.08	0.3 max.
4. Lead (Pb) content, %	1.8	1.6 – 2.5
5. Tin (Sn) content, %	0.11	0.3 max.
6. Zinc (Zn) content, %	40.3	Remainder
7. Iron (Fe) content, %	0.17	0.3 max.
Hence, others content, %	<0.2	0.2 max.

Note : Based on the test results of the submitted sample, it is found that the sample complies with the chemical composition specification of BS EN 12164 : 2016 Grade CW617N.

The chemical composition results are obtained from our test report no. 205153EN203033.

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6. Chemical Composition (Disc)

Testing items	Results	Specification according to BS EN 12164 : 2016 Grade CW617N
1. Aluminum (Al) content, %	<0.01	0.05 max.
2. Copper (Cu) content, %	57.6	57.0 – 59.0
3. Nickel (Ni) content, %	<0.08	0.3 max.
4. Lead (Pb) content, %	1.8	1.6 – 2.5
5. Tin (Sn) content, %	0.11	0.3 max.
6. Zinc (Zn) content, %	40.2	Remainder
7. Iron (Fe) content, %	0.17	0.3 max.
Hence, others content, %	<0.2	0.2 max.

Note : Based on the test results of the submitted sample, it is found that the sample complies with the chemical composition specification of BS EN 12164 : 2016 Grade CW617N.
The chemical composition results are obtained from our test report no. 205153EN203033.

7. Chemical Composition (Stem)

Testing items	Results	Specification according to BS EN 12164 : 2016 Grade CW614N
1. Aluminium (Al) content, %	0.02	0.05 max.
2. Copper (Cu) content, %	57.8	57.0 – 59.0
3. Nickel (Ni) content, %	<0.08	0.3 max.
4. Lead (Pb) content, %	2.7	2.5 – 3.5
5. Tin (Sn) content, %	0.18	0.3 max.
6. Zinc (Zn) content, %	39.0	Remainder
7. Iron (Fe) content, %	0.16	0.3 max.
Hence, others content, %	<0.2	0.2 max.

Note : Based on the test results of the submitted sample, it is found that the sample complies with the chemical composition specification of BS EN 12164 : 2016 Grade CW614N.
The chemical composition results are obtained from our test report no. 205153EN203033.

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8. Summary of Results

Dimension	-- Pass
Water Flow Rate and Outlet Pressure Test	-- Not Applicable
Hydraulic pressure test	-- Pass
Chemical Composition (Body)	-- Pass
Chemical Composition (Bonnet)	-- Pass
Chemical Composition (Disc)	-- Pass
Chemical Composition (Stem)	-- Pass

Remarks : The test results relate only to the samples tested.

Checked by : _____ Date : - 8 DEC 2020

Certified by : _____ Date : - 8 DEC 2020

Ng Shu Shing Chris
Assistant Manager (Plumbing Components)

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Test Sample

Body Marking

Body Marking

End of Report