

Test Report

Test

Title : Testing of Thermostatic Mixing Valve

Method : BS EN 1287: 1999; BS EN 1982: 2008 & BS EN 12164: 2016

Report No. :

Completion :

Applicant (Information below provided by client)

Name :

Address :

Sample (Information below provided by client)

Brand :

Model :

Body marking :

Manufacturer :

Origin :

Description : ½" Thermostatic mixer

Approved Signatory

Signature :

Name (title) :

Date :

Summary

Test	Remark
1 Dimensions	C
2.1 Leaktightness of the thermostatic mixing valve upstream of the obturator and of the obturator	C
2.2 Leaktightness of the obturator of the thermostatic mixing valve	C
2.3 Leaktightness of the thermostatic mixing valve downstream of the obturator	C
2.4 Mechanical performance upstream of the obturator - Obturator in the closed position	C
3.1 Determination of flow rate	N
3.2 Sensitivity	C
3.3 Safety with cold water failure	C
3.4 Temperature stability with changing inlet pressure	C
3.5 Temperature stability with changing inlet temperature	C
4.1 Chemical composition of metal component - Body	C
4.2 Chemical composition of metal component - Base	C
5.1 Metal extraction from Thermostatic Valve Cartridge (no adverse physical effect on or hazard to human beings)	C
5.2 Metal extraction from Rubber Ring (no adverse physical effect on or hazard to human beings)	C
5.3 Metal extraction from Diverter (no adverse physical effect on or hazard to human beings)	C

Results (apply to samples tested)

1 Dimensions

BS EN 1287:1999 Cl. 8

ID	Variable	Unit	Measured	Required	Remark
1	Nominal size	in	½ ✓	½	C
	Vertical distance from lowest point of the outlet orifice to the mounting surface	mm	Not Applicable	≥ 25	Not Applicable
Overall result					C ✓

2.1 Leaktightness of the thermostatic mixing valve upstream of the obturator and of the obturator

BS EN 1287:1999 Cl. 9.3

ID	Variable	Unit	Measured	Required	Remark
1	Static pressure	bar	16 ✓	16 ± 0.5	C ✓
	Duration	s	60 ✓	60 ± 5	C ✓
	Leakage	---	No ✓	No	C ✓
Overall result					C ✓

2.2 Leaktightness of the obturator of the thermostatic mixing valve

BS EN 1287:1999 Cl. 9.4

ID	Variable	Unit	Measured	Required	Remark
Hot to cold	Static pressure	bar	4 ✓	4 ± 0.2	C ✓
	Duration	s	60 ✓	60 ± 5	C ✓
	Leakage	---	No ✓	No	C ✓
Cold to hot	Static pressure	bar	4 ✓	4 ± 0.2	C ✓
	Duration	s	60 ✓	60 ± 5	C ✓
	Leakage	---	No ✓	No	C ✓
Overall result					C ✓

2.3 Leaktightness of the thermostatic mixing valve downstream of the obturator

BS EN 1287:1999 Cl. 9.5

ID	Variable	Unit	Measured	Required	Remark
High pressure	Static pressure	bar	4 ✓	4 ± 0.2	C ✓
	Duration	s	60 ✓	60 ± 5	C ✓
	Leakage	---	No ✓	No	C ✓
Low pressure	Static pressure	bar	0.2 ✓	0.2 ± 0.05	C ✓
	Duration	s	60 ✓	60 ± 5	C ✓
	Leakage	---	No ✓	No	C ✓
Overall result					C ✓

2.4 Mechanical performance upstream of the obturator - Obturator in the closed position

BS EN 1287:1999: Cl. 11.3

ID	Variable	Unit	Measured	Required	Remark
1	Static pressure	bar	25 ✓	25 ± 0.5	C ✓
	Duration	s	60 ✓	60 ± 5	C ✓
	Permanent deformation	---	No ✓	No	C ✓
Overall result					C ✓

3.1 Determination of flow rate

BS EN 1287:1999 Cl. 10.5

ID	Variable	Unit	Measured	Required	Remark
1	Temperature	°C	Full cold	N	N
	Dynamic pressure	bar	0.1 ✓	0.1 ± 0.005	C ✓
	Flow rate (main outlet mode)	l/s	0.055	N	N
	Flow rate (shower mode)	l/s	0.048	N	N
2	Temperature	°C	34	N	N
	Dynamic pressure	bar	0.1 ✓	0.1 ± 0.005	C ✓
	Flow rate (main outlet mode)	l/s	0.054	N	N
	Flow rate (shower mode)	l/s	0.052	N	N
3	Temperature	°C	38	N	N
	Dynamic pressure	bar	0.1 ✓	0.1 ± 0.005	C ✓
	Flow rate (main outlet mode)	l/s	0.056	N	N
	Flow rate (shower mode)	l/s	0.053	N	N
4	Temperature	°C	42	N	N
	Dynamic pressure	bar	0.1 ✓	0.1 ± 0.005	C ✓
	Flow rate (main outlet mode)	l/s	0.058	N	N
	Flow rate (shower mode)	l/s	0.053	N	N
5	Temperature	°C	Full hot	N	N
	Dynamic pressure	bar	0.1 ✓	0.1 ± 0.005	C ✓
	Flow rate (main outlet mode)	l/s	0.050	N	N
	Flow rate (shower mode)	l/s	0.047	N	N
Overall result					N

Note:

- WSD has waived the minimum flow rate requirement per WSD Circular Letter No. 1/2010.

3.2 Sensitivity

BS EN 1287:1999 Cl. 10.6

ID	Variable	Unit	Measured	Required	Remark
1	Arc distance from 34°C to 42°C	mm	32.5 ✓	≥ 12	C ✓
	Arc distance from 42°C to 34°C	mm	31 ✓	≥ 12	C ✓
Overall result					C ✓

3.3 Safety with cold water failure

BS EN 1287:1999 Cl. 10.7

ID	Variable	Unit	Measured	Required	Remark
First 5s	Outlet water volume	ml	35 ✓	≤ 200	C ✓
	Outlet water temperature	°C	39.4 ✓	≤ 42	C ✓
Next 30s	Outlet water volume	ml	100 ✓	≤ 300	C ✓
Restored	Outlet water temperature	°C	38.3 ✓	38 ± 2 °C	C ✓
Overall result					C ✓

3.4 Temperature stability with changing inlet pressure

BS EN 1287:1999 Cl. 10.8

ID	Variable	Unit	Measured	Required	Remark
1	Initial outlet water temperature	°C	38 ✓	38 ± 1 °C	C ✓
2	Water temperature after pressure reduction and stabilization	°C	36.5	N	N
	Difference in outlet water temperature from initial	°C	-1.5	≤ 2 & ≥ -2	C
3	Water temperature after pressure restoration and stabilization	°C	38	N	N
	Difference in outlet water temperature from initial	°C	0 ✓	≤ 2 & ≥ -2	C
Overall result					C ✓

3.5 Temperature stability with changing inlet temperature

BS EN 1287:1999 Cl. 10.9

ID	Variable	Unit	Measured	Required	Remark
1	Initial outlet water temperature	°C	38.1	38 ± 1 °C	C
2	Water temperature after temperature reduction and stabilization	°C	37.5	N	N
	Difference in outlet water temperature from initial	°C	-0.6	≤ 2 & ≥ -2	C ✓
3	Water temperature after temperature restoration and stabilization	°C	38.2	N	N
	Difference in outlet water temperature from initial	°C	0.1 ✓	≤ 2 & ≥ -2	C ✓
Overall result					C ✓

4.1 Chemical composition of metal component - Body

Designation: BS EN 1982:2008: CC754S

ID	Variable	Unit	Measured	Required	Remark
Body	Copper	%	61.1 ✓	58.0 - 63.0	C ✓
	Zinc	%	37.3 ✓	R	C ✓
	Lead	%	1.4 ✓	0.5 - 2.5	C ✓
	Tin	%	<0.025 ✓	max. 1.0	C ✓
	Nickel	%	0.1 ✓	max. 1.0	C ✓
	Iron	%	0.1 ✓	max. 0.7	C ✓
	Aluminium	%	<0.005 ✓	max. 0.8	C ✓
	Manganese	%	<0.015 ✓	max. 0.5	C ✓
	Phosphorus	%	<0.007 ✓	max. 0.02	C ✓
	Silicon	%	<0.025 ✓	max. 0.05	C ✓
Overall result					C ✓

4.2 Chemical composition of metal component - Base

Designation: BS EN 12164:2016: CW511L

ID	Variable	Unit	Measured	Required	Remark
Base	Copper	%	62.3 ✓	61.5 - 63.5	C ✓
	Zinc	%	37.6 ✓	R	C ✓
	Lead	%	<0.015 ✓	max. 0.2	C ✓
	Tin	%	<0.025 ✓	max. 0.1	C ✓
	Nickel	%	0.1 ✓	max. 0.3	C ✓
	Iron	%	<0.022 ✓	max. 0.1	C ✓
	Aluminium	%	<0.005 ✓	max. 0.05	C ✓
	Arsenic	%	0.06 ✓	0.02 - 0.15	C ✓
	Others Total	%	0.05 ✓	max. 0.2	C ✓
Overall result					C ✓

5.1 Metal extraction from Thermostatic Valve Cartridge (no adverse physical effect on or hazard to human beings)

In-house method

ID	Variable	Unit	Measured	Required	Remark
Thermostatic Valve Cartridge	Arsenic	µg/l	< 1.5 ✓	≤ 10	C ✓
	Lead	µg/l	< 2 ✓	≤ 10	C ✓
	Cadmium	µg/l	< 1 ✓	≤ 3	C ✓
	Chromium	µg/l	< 2 ✓	≤ 50	C ✓
	Selenium	µg/l	< 2 ✓	≤ 40	C ✓
	Nickel	µg/l	< 2 ✓	≤ 70	C ✓
Overall result					C ✓

5.2 Metal extraction from Rubber Ring (no adverse physical effect on or hazard to human beings)

In-house method

ID	Variable	Unit	Measured	Required	Remark
Rubber Ring	Arsenic	µg/l	< 1.5 ✓	≤ 10	C ✓
	Lead	µg/l	< 2 ✓	≤ 10	C ✓
	Cadmium	µg/l	< 1 ✓	≤ 3	C ✓
	Chromium	µg/l	< 2 ✓	≤ 50	C ✓
	Selenium	µg/l	< 2 ✓	≤ 40	C ✓
	Nickel	µg/l	< 2 ✓	≤ 70	C ✓
Overall result					C ✓

5.3 Metal extraction from Diverter (no adverse physical effect on or hazard to human beings)

In-house method

ID	Variable	Unit	Measured	Required	Remark
Diverter	Arsenic	µg/l	< 1.5 ✓	≤ 10	C ✓
	Lead	µg/l	< 2 ✓	≤ 10	C ✓
	Cadmium	µg/l	< 1 ✓	≤ 3	C ✓
	Chromium	µg/l	< 2 ✓	≤ 50	C ✓
	Selenium	µg/l	< 2 ✓	≤ 40	C ✓
	Nickel	µg/l	< 2 ✓	≤ 70	C ✓
Overall result					C ✓

Notes :

- Metals are extracted by immersing the component in boiling deionized water for five minutes.
- Requirements are based on WHO Guidelines for Drinking Water Quality Fourth Edition: 2011.

Remark :

- No electroplating materials were observed on the internal water passage surfaces of the sample under a non-destructive and unaided visual inspection.

Figure 1 - Sample



Figure 2 - Seat bore

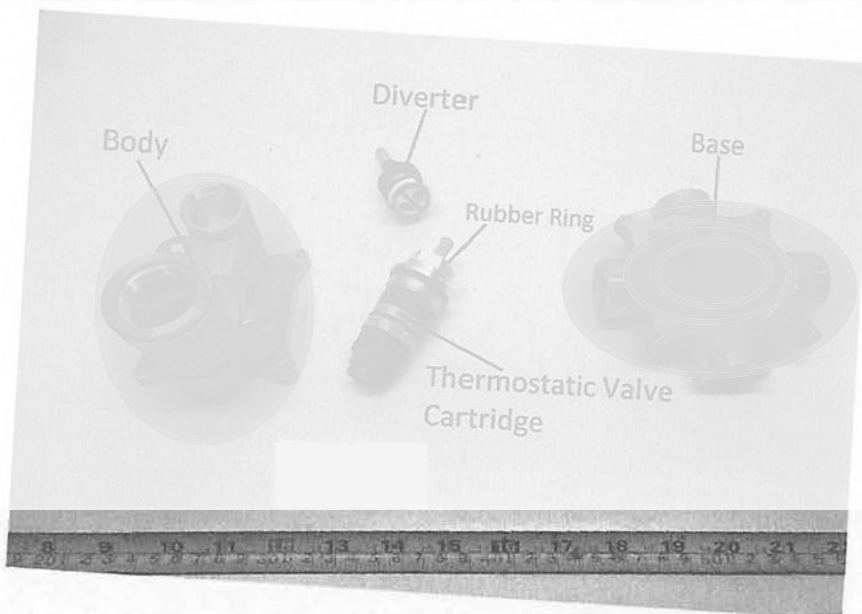
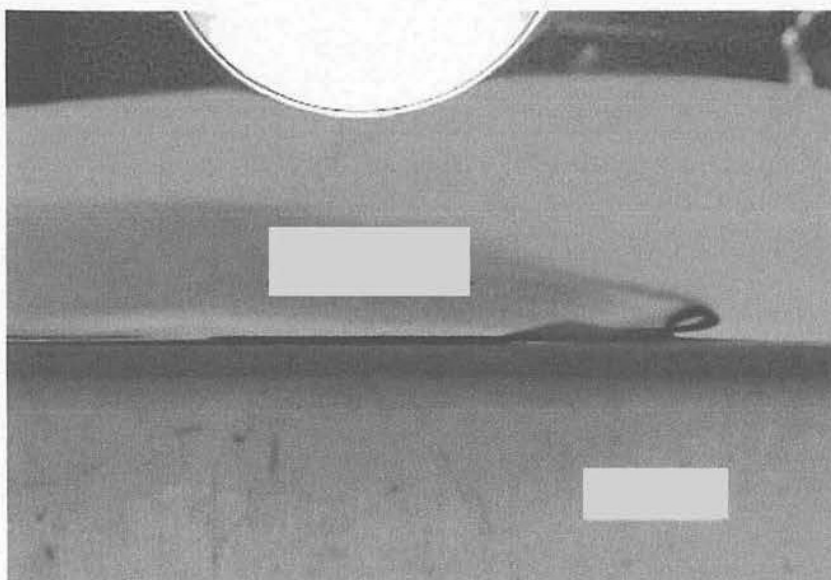


Figure 3 - Internal water passage



Figure 4 - Body marking



General Note(s)

Definitions:

- C - conformance
- N - no requirement
- NC - non-conformance
- R - remainder

Organizations:

- HKAS - Hong Kong Accreditation Service
- HOKLAS - Hong Kong Laboratory Accreditation Scheme
- WSD - Water Supplies Department (of Hong Kong)
- WHO - World Health Organization

- End of report -