

Test Report No. 719189135-MEC10/02-CLC
dated 10 NOV 2010



PSB Singapore

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SUBJECT:

Testing of Tap/Fitting/Mixers.

TESTED FOR:

Vola A/S
Lunavej 2
DK 8700 Horsens
Denmark

Attn: Mr. Tommy Jorgenson

METHOD OF TEST:

PUB Requirement for Water Efficiency Labelling Scheme

BS EN 1287 : 1999 Sanitary tapware – Low pressure thermostatic mixing valves –
General technical specifications

DESCRIPTION OF SAMPLE:

Product : Tap/Fittings/Mixers
Brand Name : Vola

S/N	Description	Model
1.	Free Standing Thermostatic Shower Faucet	FS3

Note: Refer to APPENDIX for photo.



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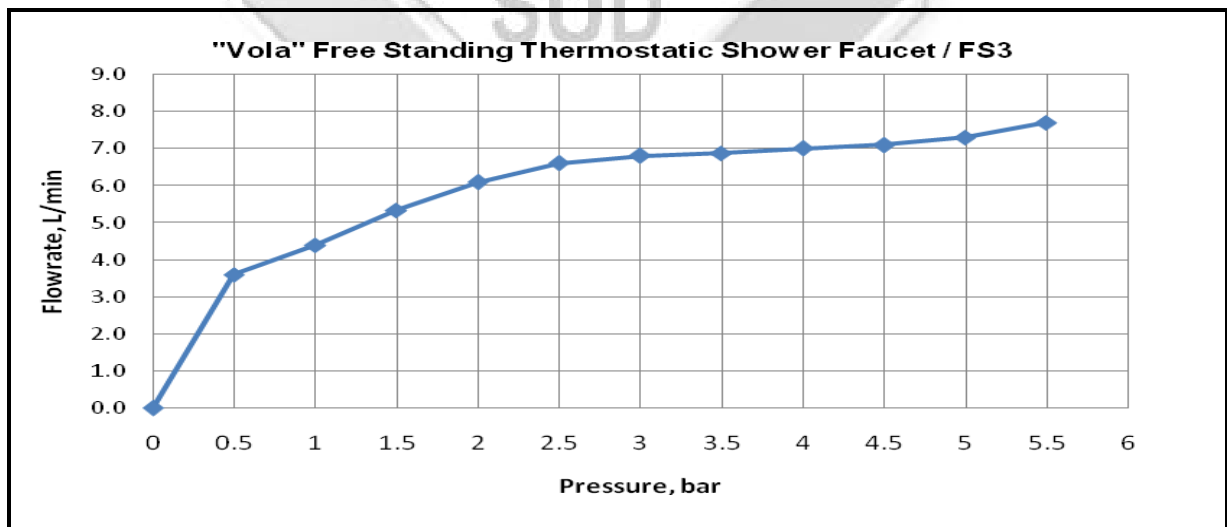
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TEST RESULTS:

Hydraulic Characteristics

- 1) Description: Free Standing Thermostatic Shower Faucet
Model: FS3

Flow Pressure (bar)	Flow Rate (litres/min)	Flow Rate Requirements for Water Efficiency Labelling	Photo
0	0	<p>Products/Fittings Shower Taps & Mixers</p> <p>7 to 9 litres/min (1 tick) 5 to 7 litres/min (2 ticks) 5 litres/min or less (3 ticks)</p>	
0.5	3.6		
1.0	4.4		
1.5	5.3		
2.0	6.1		
2.5	6.6		
3.0	6.8		
3.5	6.9		
4.0	7.0		
4.5	7.1		
5.0	7.3		
5.5	7.7		



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TEST RESULTS:

(A1) Leaktightness Characteristics

Sample Reference Characteristics	Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
Leaktightness of the thermostatic mixing valve upstream of the obturator and of the obturator	Passed	Clause 9.3.2 The valve shall withstand a hydraulic pressure of 16 bar for a duration of 60 seconds without leakage.
Leaktightness of the thermostatic mixing valve downstream of the obturator	Passed	Clause 9.5.2 The valve shall withstand a hydraulic pressure of 16 bar for a duration of 60 seconds without leakage.
Leaktightness of the manual diverter of the thermostatic mixing valve	Passed	Clause 9.6.2 For the duration of the test, there shall be no leakage at the outlet points indicated.

(B1) Torsion Test

Sample Reference Characteristics	Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
Submitting the operating mechanism to a given torque to verify its strength with no water supplied	Passed	Clause 13.2.4 There shall be no deformation or other deterioration which impairs the function of the mixing valve; the mixing valve shall satisfy the requirement for leaktightness.

(C1) Mechanical Performance under Pressure Characteristics

Sample Reference Characteristics	Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
Mechanical behaviour upstream of the obturator - Obturator in the close position	Passed	Clause 11.3.2 Throughout the duration of the test, there shall be no permanent deformation of the thermostatic mixing valve.
Mechanical behaviour downstream of the obturator - Obturator in the open position	Passed	Clause 11.4.2 There shall be no permanent deformation of the thermostatic mixing valve.

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TEST RESULTS: (Cont'd)

(D1) Mechanical Endurance Characteristics (On/Off Flow control device)

Sample Reference	Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
50,000 cycles of opening & closing	Passed	Clause 12.2.4 During the test, no failure of any component part shall occur. After the test, verify the application of the tests given in 9.3 to 9.5.

(E1) Mechanical Endurance Characteristics (Manual Diverter)

Sample Reference	Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
30,000 cycles of opening & closing	Passed	Clause 12.3.2 During the test, no component fracture, blockage of the mechanism, leakage from the nozzle or shower/shower head or the diverter control joint shall occur.

(F1) Hydraulic Operating Characteristics – Determination of flow rate

Sample Reference	Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement			
Flow rate test at dynamic reference pressure 0.1 bar	Combined	Shower	2.5**	4,8 to 6,0 l/min	Wash basin
				6,0 to 7,5 l/min	Showers, sinks
				7,5 to 15,0 l/min	bidet
				Min. 15 l/min	Baths

***Non-compliance with BS EN 1287 : 1999 requirements (Please refer to page 6 of 8).

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TEST RESULTS: (Cont'd)

(G1) Hydraulic Operating Characteristics – Sensitivity

Characteristics	Sample Reference Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
Sensitivity	Passed	Shall comply with Clause 10.6

(H1) Hydraulic Operating Characteristics – Safety with Cold Water Failure

Characteristics	Sample Reference Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
Blend water temperature before test (°C)	38.8° C	38 ± 1 °C
Volume of water collected during the first 5s after cold water failure	50 ml	200 ml max
Volume of water collected during the second collection period of 30s after cold water failure	60 ml	300 ml max
Temperature of mixed water after restoration of the cold water	39.6° C	Deviation from set temperature shall not exceed 2°C

(J1) Hydraulic Operating Characteristics – Temperature stability with changing inlet pressure

Characteristics	Sample Reference Free Standing Thermostatic Shower Faucet FS3	BS EN 1287 : 1999 Requirement
Blend water temperature before test (°C)	37.8° C	38 ± 1 °C
Temperature of the mixed water after pressure reduction and stabilization	38.6°C	Deviation from set temperature shall not exceed 2°
Temperature of the mixed water after pressure restoration and stabilization	39.3°C	Deviation from set temperature shall not exceed 2°

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REMARKS:

S/N	Type of tap fittings	Model	BS EN 1287 : 1999 Requirement	Characteristics
1.	Free Standing Thermostatic Shower Faucet	FS3	Complied	A) Leaktightness Characteristics B) Torsion Test C) Mechanical Performance under Pressure Characteristics D) Mechanical Endurance Characteristics (On/off control device) E) Mechanical Endurance Characteristics (Manual Diverter) G) Hydraulic Operating Characteristics – Sensitivity H) Hydraulic Operating Characteristics – Safety with Cold Water Failure J) Hydraulic Operating Characteristics – Temperature stability with changing inlet pressure

- a. The test sample complied with BS EN 1287 : 1999 requirements except hydraulic characteristics.
- b. The hydraulic characteristics complied with SS CP 48: 2005 requirements.
- c. Effect on Water Reference : S08MEC07709-1A&1B-LYP dated 08/04/2009 and S08MEC07709-2A&2B-LYP dated 08/04/2009
- b. Metal toxicity Reference : S08MEC07709-EO dated 24/Apr/2009.
- c. Salt Spray Reference : S08MEC07709-PGK dated 01/Apr/2009.


Chua Lee Choong
Associate Engineer


Chua Peck Cheong
Product Manager
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Mechanical Centre

APPENDIX:



Photo 1. Free Standing Thermostatic Shower Faucet
Model: FS3

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March 2010