

Test Report No. 719177508-MEC10/03-CLC
dated 27 SEPT 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.	Thermostatic mixer with double swivel spout for bath filling, and one-handle mixer with hand shower	VOLA BK15

Note:

Refer to APPENDIX for photo.



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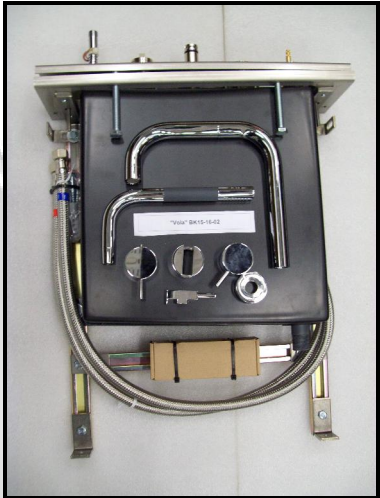
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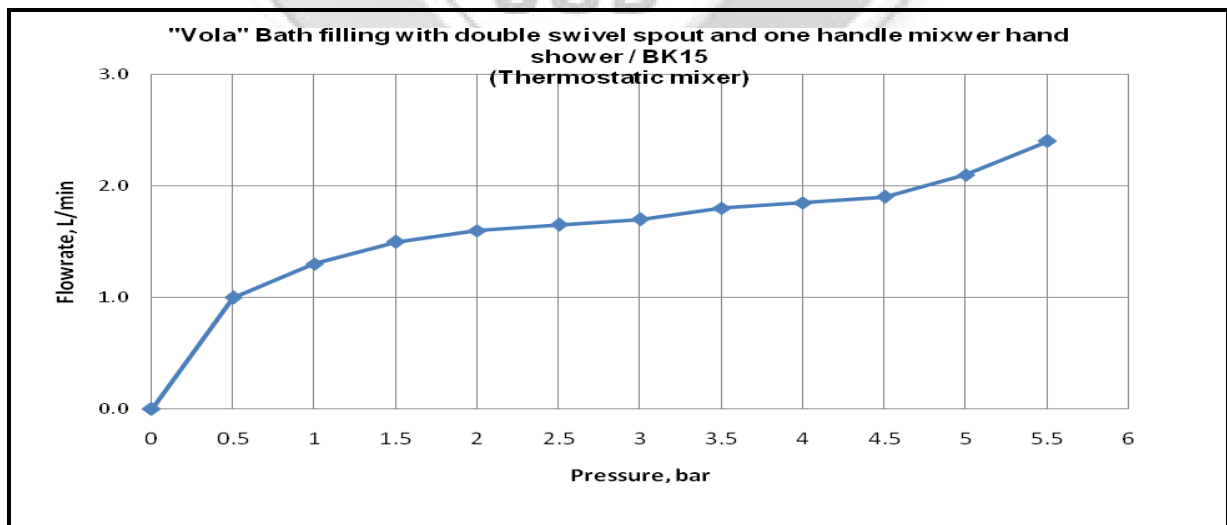
TEST RESULTS:

Hydraulic Characteristics

- 1) Description: Thermostatic mixer with double swivel spout for bath filling,
and one-handle mixer with hand shower

Model: BK15

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	1.0		
1.0	1.3		
1.5	1.5		
2.0	1.6		
2.5	1.7		
3.0	1.7		
3.5	1.8		
4.0	1.9		
4.5	1.9		
5.0	2.1		
5.5	2.4		



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TEST RESULTS:

(A1) Leaktightness Characteristics

Sample Reference	VOLA BK15	BS EN 1287 : 1999 Requirement
Characteristics		
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	VOLA BK15	BS EN 1287 : 1999 Requirement
Characteristics		
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	VOLA BK15	BS EN 1287 : 1999 Requirement
Characteristics		
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) Hydraulic Operating Characteristics – Determination of flow rate

Sample Reference		VOLA BK15		BS EN 1287 : 1999 Requirement	
Characteristics					
Flow rate test at dynamic reference pressure 0.1 bar	Combined	Shower	0.6**	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).

(E1) Hydraulic Operating Characteristics – Sensitivity

Sample Reference	VOLA BK15	BS EN 1287 : 1999 Requirement
Characteristics		
Sensitivity	Passed	Shall comply with Clause 10.6

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TEST RESULTS: (Cont'd)

(F1) Hydraulic Operating Characteristics – Safety with Cold Water Failure

Sample Reference	VOLA BK15	BS EN 1287 : 1999 Requirement
Characteristics		
Blend water temperature before test (°C)	38.4° C	38 ± 1 °C
Volume of water collected during the first 5s after cold water failure	10 ml	200 ml max
Volume of water collected during the second collection period of 30s after cold water failure	10 ml	300 ml max
Temperature of mixed water after restoration of the cold water	39.8° C	Deviation from set temperature shall not exceed 2°C

(G1) Hydraulic Operating Characteristics – Temperature stability with changing inlet pressure

Sample Reference	VOLA BK15	BS EN 1287 : 1999 Requirement
Characteristics		
Blend water temperature before test (°C)	38.3° C	38 ± 1 °C
Temperature of the mixed water after pressure reduction and stabilization	38.7°C	Deviation from set temperature shall not exceed 2°
Temperature of the mixed water after pressure restoration and stabilization	39.6°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.	Thermostatic mixer with double swivel spout for bath filling, and one-handle mixer with hand shower	VOLA BK15	Complied	A) Leaktightness Characteristics B) Torsion Test C) Mechanical Performance under Pressure Characteristics D) Hydraulic Operating Characteristics – Determination of flow rate E) Hydraulic Operating Characteristics – Sensitivity F) Hydraulic Operating Characteristics – Safety with Cold Water Failure G) Hydraulic Operating Characteristics – Temperature stability with changing inlet pressure

- a. Effect on Water Reference : S08MEC07709-1A&1B-LYP dated 08/04/2009 and S08MEC07709-2A&2B-LYP dated 08/04/2009
- b. Chemical Composition BS EN 12165 Reference : 719176458-MEC10-CES dated 29/Apr/2010.
- c. DZR BS EN 12165 Reference : 719176458-MEC10-YYH-SBT dated 27 Apr 2010.
- d. Mechanical Endurance (On/off Flow control device) Reference : 719177508-MEC10/02-CLC dated 27/Sep/2010.
- e. Mechanical Endurance (Manual Diverter) Reference : 719177508-MEC10/02-CLC dated 27/Sep/2010.


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APPENDIX

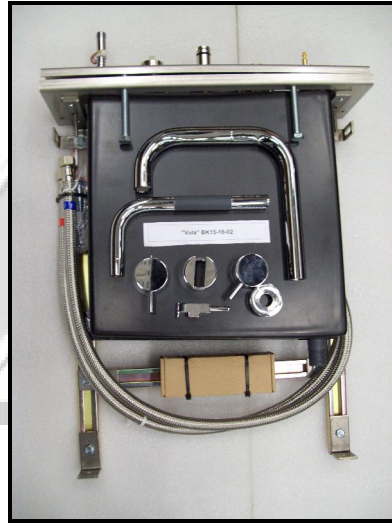


Photo 1. VOLA 15
Thermostatic mixer with double swivel spout for bath
filling, and one-handle mixer with hand shower

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March 2010