

Test Report No. 719176458-MEC10/02-CLC
dated 22 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:

BS 5412 : 1996 Specification for low-resistance single taps and combination tap assemblies (nominal size ½ and ¾) suitable for operation at PN 10 max.

DESCRIPTION OF SAMPLE:

Product : Tap/Fittings/Mixers
Brand Name : Vola

S/N	Description
1.	VOLA 4000 with Electronic valve (Concealed)
2.	VOLA 4100 with Electronic valve (Concealed)
3.	VOLA 900 Build-in Bib Tap (Concealed)

Note:

Refer to APPENDIX for photo.



TÜV SÜD PSB

Laboratory:
TÜV SÜD PSB Pte. Ltd.
No.1 Science Park Drive
Singapore 118221

Phone : +65-6885 1333
Fax : +65-6776 8670
E-mail: testing@tuv-sud-psb.sg
www.tuv-sud-psb.sg
Co. Reg : 199002667R

Regional Head Office:
TÜV SÜD Asia Pacific Pte. Ltd.
3 Science Park Drive, #04-01/05
The Franklin, Singapore 118223
TUV[®]



TEST RESULTS:

(A1) Water Tightness & Pressure Resistance Characteristics

Sample Reference		VOLA 4000	BS 5412 : 1996 Requirement
Characteristics			
Obturator on seat and upstream of obturator		Passed	Clause 8.2.2.1 (a) Watertightness of the obturator: Throughout the duration of the test, there shall be no leakage past the obturator.
		Passed	(b) Watertightness upstream: Throughout the duration of the test, there shall be no leakage or seepage through the walls.
Downstream of obturator		Passed	Clause 8.2.3.1 Throughout the duration of the test, there shall be no leakage, or seepage through the seals.
Mechanical behaviour upstream		Passed	Clause 9.2.2 There shall be no deformation or leakage.
Mechanical Behaviour Downstream	Tap without jet regulator	Passed	Clause 9.2.3 No permanent deformation shall be produced in that part of the tap situated downstream of the obturator.

(B1) Hydraulic Characteristics

Sample Reference		VOLA 4000	BS 5412 : 1996 Requirement
Characteristics			
Flow rate test at 0.1 bar running pressure	Combined	1.5**	Combination taps assemblies (each side tested separately). ½" tap : 7.5 (l/min) min.
			Combination taps assemblies (both tap fully open). ½" tap : 10.8 (l/min) min.

***Non-compliance with BS 5412 : 1996 requirements (Please refer to page 7 of 9).

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TEST RESULTS: Cont'd

(C1) Mechanical Endurance Test of Obturator (Sensor)

Sample Reference	VOLA 4000	BS 5412 : 1996 Requirement
Characteristics		
Number of cycles : 200,000	Passed	Clause 12.1.4 After testing, the tap shall again satisfy the watertightness criteria given in clause 8 and there shall be no permanent deflection or failure of any component part.

(D1) Repeat Watertightness Test

Sample Reference	VOLA 4000	BS 5412 : 1996 Requirement
Characteristics		
Obturator on seat and upstream of obturator	a) Passed	Clause 8.2.2.1 a) Watertightness of the obturator: Throughout the duration of the test, there shall be no leakage past the obturator.
	b) Passed	b) Watertightness upstream: Throughout the duration of the test, there shall be no leakage or seepage through the walls.
Downstream of obturator	Passed	Clause 8.2.3.1 Throughout the duration of the test, there shall be no leakage, or seepage through the seals.

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TEST RESULTS: Cont'd

(E1) Hydraulic Characteristics

Sample Reference Characteristics	VOLA 4000	SS CP 48 Requirement
Timing test for delay action tap	Passed	Timing 2~3 seconds

(F1) Power Failure Check

Sample Reference Characteristics	VOLA 4000	Requirement
Upstream of obturator	Passed	During the power failure simulation, the water flow should stopped under circumstances of (On or Off Mode)

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TEST RESULTS:

(A2) Water Tightness & Pressure Resistance Characteristics

Sample Reference		VOLA 4100	BS 5412 : 1996 Requirement
Characteristics			
Obturator on seat and upstream of obturator		Passed	Clause 8.2.2.1 (c) Watertightness of the obturator: Throughout the duration of the test, there shall be no leakage past the obturator.
		Passed	(d) Watertightness upstream: Throughout the duration of the test, there shall be no leakage or seepage through the walls.
Downstream of obturator		Passed	Clause 8.2.3.1 Throughout the duration of the test, there shall be no leakage, or seepage through the seals.
Mechanical behaviour upstream		Passed	Clause 9.2.2 There shall be no deformation or leakage.
Mechanical Behaviour Downstream	Tap without jet regulator	Passed	Clause 9.2.3 No permanent deformation shall be produced in that part of the tap situated downstream of the obturator.

(B2) Hydraulic Characteristics

Sample Reference		VOLA 4100	BS 5412 : 1996 Requirement
Characteristics			
Flow rate test at 0.1 bar running pressure	Combined	1.2**	Combination taps assemblies (each side tested separately). ½" tap : 7.5 (l/min) min.
			Combination taps assemblies (both tap fully open). ½" tap : 10.8 (l/min) min.

***Non-compliance with BS 5412 : 1996 requirements (Please refer to page 7 of 9).

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TEST RESULTS:

(A3) Water Tightness & Pressure Resistance Characteristics

Sample Reference		VOLA 900	BS 5412 : 1996 Requirement
Characteristics			
Obturator on seat and upstream of obturator		Passed	Clause 8.2.2.1 (e) Watertightness of the obturator: Throughout the duration of the test, there shall be no leakage past the obturator.
		Passed	(f) Watertightness upstream: Throughout the duration of the test, there shall be no leakage or seepage through the walls.
Downstream of obturator		Passed	Clause 8.2.3.1 Throughout the duration of the test, there shall be no leakage, or seepage through the seals.
Mechanical behaviour upstream		Passed	Clause 9.2.2 There shall be no deformation or leakage.
Mechanical Behaviour Downstream	Tap without jet regulator	Passed	Clause 9.2.3 No permanent deformation shall be produced in that part of the tap situated downstream of the obturator.

(B3) Hydraulic Characteristics

Sample Reference		VOLA 900	BS 5412 : 1996 Requirement
Characteristics			
Flow rate test at 0.1 bar running pressure	Combined	1.5**	Combination taps assemblies (each side tested separately). ½" tap : 7.5 (l/min) min.
			Combination taps assemblies (both tap fully open). ½" tap : 10.8 (l/min) min.

***Non-compliance with BS 5412 : 1996 requirements (Please refer to page 7 of 9).

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REMARKS:

S/N	Type of tap fittings/ Model	BS 5412: 1996 Requirements	Characteristics
1.	VOLA 4000 with Electronic valve (Concealed)	Complied	A. Watertightness & pressure resistance C. Mechanical endurance D. Repeat watertightness
2.	VOLA 4100 with Electronic valve (Concealed)	Complied	
3.	VOLA 900 Build-in Bib Tap (Concealed)	Complied	

- a. The test sample complied with BS 5412 : 1996 requirements except hydraulic characteristics which complied with SS CP 48: 1989 requirements.
- b. Effect on Water Reference : S08MEC07709-1A&1B-LYP dated 08/04/2009 and S08MEC07709-2A&2B-LYP dated 08/04/2009
- c. Headwork Endurance Reference : 719176458-MEC10/02-CLC dated 22/Sept/2010
- d. Chemical Composition BS EN 12165 Reference : 719176458-MEC10-CES dated 29/Apr/2010.
- e. DZR BS EN 12165 Reference : 719176458-MEC10-YYH-SBT dated 27 Apr 2010.


Chua Lee Choong
Associate Engineer


Chua Peck Cheong
Product Manager
Automotive & Industrial Group
Mechanical Centre

APPENDIX

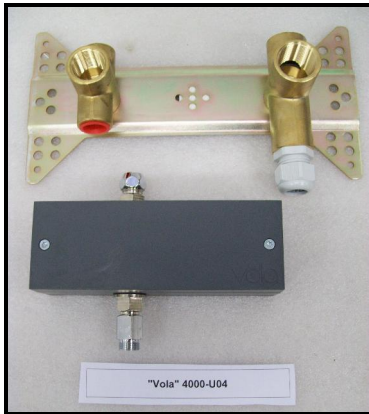


Photo 1. VOLA 4000 with Electronic valve
(Concealed)

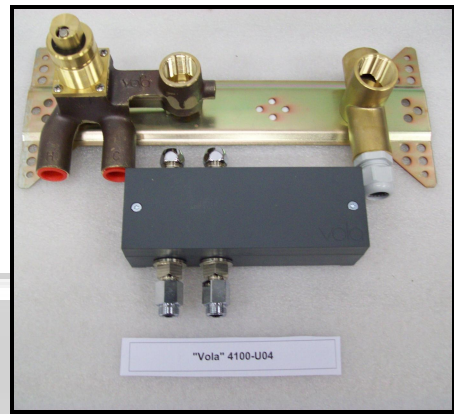


Photo 2. VOLA 4100 with Electronic valve
(Concealed)



Photo 3 VOLA 900 Build-in Bib Tap
(Concealed)

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March 2010