SINTEF Community
Postal address:
Postboks 124 Blindern
0314 Oslo, Norway
Switchboard: +47 40005100
info@sintef.no

Enterprise /VAT No:
NO 919 303 808 MVA

NORSK AKKREDITERING
Test 107

Test report

Testing of kitchen mixers from Akvatur ApS, type Taurus Flex 5-1

Test method EN 817:2008

SANITARY LABORATORY	**DATE** 2023-12-11
AUTHOR Dag Fredrik Nedberg	**VERSION** 1
CLIENT Akvatur ApS, Lillehøjvej 23 8600 Silkeborg, Denmark	**CLIENT'S REFERENCE** Bent Iversen
PROJECT NO. 102000264-831	**NUMBER OF PAGES**: 12 + 3 Appendices

SUMMARY
SINTEF Community has on behalf of Akvatur ApS conducted testing of kitchen mixers, type Taurus Flex 5-1.

The tests were conducted in accordance with NS-EN 817:2008 *Sanitary tapware – Mechanical mixing valves (PN 10) - General technical specification*.

See Table 4.1 for conducted tests.

Result: Passed

PREPARED BY Dag Fredrik Nedberg	SIGNATURE Dag Fredrik Nedberg
CHECKED BY Geir Lippe Stavnes	SIGNATURE Geir L Stavnes
APPROVED BY Pål Harstad	SIGNATURE Pål Harstad

REPORT NO 2023:01342	**CLASSIFICATION** Restricted	**CLASSIFICATION THIS PAGE** Restricted

MANAGEMENT SYSTEM CERTIFICATION
DNV·GL
ISO 9001 = ISO 14001
OHSAS 18001

Table of contents

APPENDICES

1 INTRODUCTION

SINTEF Community has on behalf of Akvatur ApS conducted testing of kitchen mixers, type Taurus Flex 5-1.

The tests according to NS-EN 817 were performed by Dag Fredrik Nedberg (M.Sc.). The tests were performed in the Sanitary lab. (U47) between 2023-10-31 and 2023-12-11.

Evaluations of impartiality have been performed in all steps of the testing process, and impartiality has been found to be in accordance with SINTEF's quality management system and the current standard for the activity.

2 TEST METHOD

The tests were performed in accordance with NS-EN 817:2008 *Sanitary tapware – Mechanical mixing valves (PN 10) - General technical specification*.

See Table 4.1 for performed tests.

3 TEST OBJECT

The test objects from Akvatur ApS are kitchen mixers, see Table 3.1 and Figure 3.1-3.2. The mixers are designed for use with boiling water, cooled water and carbonated water. These functions have not been tested by SINTEF Community. The mixers were delivered with flexible hoses from Neoperl.

The mixers are produced by Akvatur ApS and were delivered to SINTEF Community on 2023-10-27. They were selected by the customer and in good condition on arrival.

Table 3.1: Controlled mixers

Mixer	Designation	Aerator	Cartridge	Quantity	Figure
Taurus Flex 5-1	Appendix 1, Table 1	Unmarked T, blue	Wanhai 35 mm	3	3.1

Fig. 3.1: Taurus Flex 5-1

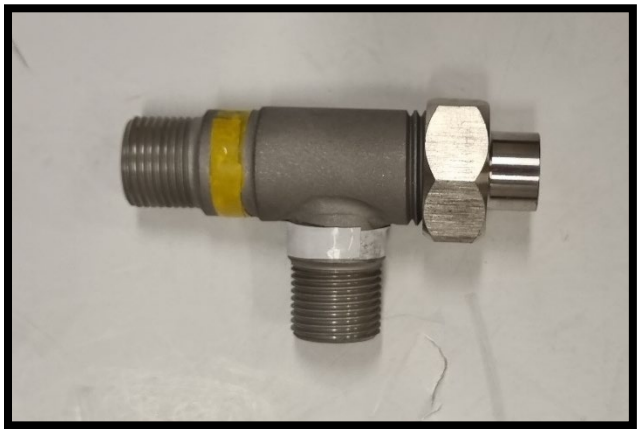


Fig. 3.2: T-fitting with check valve belonging to Taurus Flex 5-1

4 TESTS, METHODS, REQUIREMENTS AND RESULTS

Table 4.1 Summary of results

Chapter	Clause in NS-EN 817	Property	Passed		Accredited test	
			Yes	No	Yes	No
4.1	4.1	Marking	X		X	
4.2	4.2	Identification	X		X	
4.3	5.1	Chemical and hygiene requirements	- [2)]		X	
4.4	5.2	Exposed surface conditions	- [2)]			X
4.5	6	Dimensional characteristics	X		X	
4.6	8.3	Leaktightness of the mixing valve upstream of the obturator	X		X	
4.7	8.4	Leaktightness of the mixing valve downstream of the obturator	X		X	
4.8	8.5	Leaktightness of manually operated diverter	X		X	
4.9	8.6	Leaktightness and operation of diverter with automatic return	- [1)]		X	
4.10	8.7	Leaktightness of the obturator: cross flow between hot water and cold water	X		X	
4.11	9.4	Mechanical behaviour upstream of the obturator	X		X	
4.12	9.5	Mechanical behaviour downstream of the obturator	X		X	
4.13	10.6	Determination of flow rate	X		X	
4.14	10.7	Sensitivity	X		X	
4.15	11	Mechanical strength characteristics – torsion test for operating mechanism	X		X	
4.16	12.1	Mechanical endurance of the control device	X		X	
4.17	12.2	Mechanical endurance of diverters	X		X	
4.18	12.3	Mechanical endurance of swivel spouts	- [1)]		X	
4.19	13	Backflow protection	X			X
4.20	14	Acoustic characteristics	X		X	
4.21		Dry weight	X			X

1) Not applicable

2) Not considered

4.1 Marking (NS-EN 817, Clause 4.1)

Method: Visual inspection

Mixer	Result	
	Passed	Not passed
Taurus Flex 5-1	X	

Remark: The mixers are marked "TAURUS".

4.2 Identification (NS-EN 817, Clause 4.2)

Method: Visual inspection

Mixer	Result	
	Passed	Not passed
Taurus Flex 5-1	X	

Remark: The mixers are marked blue for cold water and red for hot water on the handle.

4.3 Chemical and hygienic characteristics (NS-EN 817, Clause 5.1)

Method: NKB 4, Clause 3.3.2

Mixer	Result	
	Passed	Not passed

Remark: Not considered.

4.4 Exposed surface conditions (NS-EN 817, Clause 5.2)

Method: EN 248

Mixer	Result	
	Passed	Not passed

Remark: Not considered.

4.5 Dimensional characteristics (NS-EN 817, Clause 6)

Method: Measurement and visual inspection

Mixer	Result	
	Passed	Not passed
Taurus Flex 5-1	X	

4.6 Leaktightness of the mixing valve upstream of the obturator (NS-EN 817, Clause 8.3)

Method: Outlet orifice open and the obturator closed

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
Taurus Flex 5-1	1,6	X	

4.7 Leaktightness of the mixing valve downstream of the obturator (NS-EN 817, Clause 8.4)

Method: Outlet orifice closed and the obturator open

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
Taurus Flex 5-1	0,4	X	

4.8 Leaktightness of manually operated diverter (NS-EN 817, Clause 8.5)

Method: Outlet orifice closed and the obturator open

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
Taurus Flex 5-1	0,4	X	

4.9 Leaktightness and operation of diverter with automatic return (NS-EN 817, Clause 8.6)

Method: Flow to bath and bath to flow

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
	0,4		

Remark: Not applicable.

4.10 Leaktightness of the obturator: cross flow between hot and cold water (NS-EN 817, Clause 8.7)

Method: Outlet orifice open and the obturator closed

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
Taurus Flex 5-1	0,4	X	

4.11 Mechanical behaviour upstream of the obturator (NS-EN 817, Clause 9.4)

Method: Outlet orifice open and the obturator closed

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
Taurus Flex 5-1	2,5	X	

4.12 Mechanical behaviour downstream of the obturator (NS-EN 817, Clause 9.5)

Method: Outlet orifice open and the obturator open

Mixer	Water pressure [MPa]	Result	
		Passed	Not passed
Taurus Flex 5-1	0,4	X	

4.13 Determination of flow rate (NS-EN 817, Clause 10.6)

Method: Measuring the flow rate at 0,3 MPa

Mixer	Result	
	Passed	Not passed
Taurus Flex 5-1	X	

Remark: The flow rate measured at 0,3 MPa shall be at least 0,20 l/s from fully open cold water to fully open hot water.
When equipped with flexible supply hoses, the flow rate measured at 0,3 MPa shall be at least 0,15 l/s from fully open cold water to fully open hot water.
According to EN 817:2008, a flow rate of 0,06 l/s is permissible for water saving mixers.

Table 4.2 Measured flow rate

Taurus Flex 5-1	Flow rate [l/s]	Result	
	0,3 MPa	Passed	Not passed
Fully open cold water	0,083	X	
34 °C	0,091	X	
38 °C	0,093	X	
44 °C	0,091	X	
Fully open hot water	0,087	X	

Measurement uncertainty ± 2 %

Remark: The tests were performed with factory installed aerators.

4.14 Sensitivity (NS-EN 817, Clause 10.7)

Method: Measuring the sensitivity at 0,3 MPa

Mixer	Result	
	Passed	Not passed
Taurus Flex 5-1	X	

Remark: See Appendix 3.

4.15 Mechanical strength characteristics - torsion test for operating mechanism (NS-EN 817, Clause 11)

Method: Subjecting the handle to a given torque

Mixer	Torque [Nm]	Result	
		Passed	Not passed
Taurus Flex 5-1	6	X	

4.16 Mechanical endurance of the control device (NS-EN 817, Clause 12.1)

Method: Subjecting the control device to a specific number of movements

Mixer	Movements	Result	
		Passed	Not passed
Taurus Flex 5-1	70 000	X	

4.17 Mechanical endurance of diverters (NS-EN 817, Clause 12.2)

Method: Subjecting the diverter to a specific number of movements

Mixer	Movements	Result	
		Passed	Not passed
Taurus Flex 5-1	30 000	X	

4.18 Mechanical endurance of swivel spouts (NS-EN 817, clause 12.3)

Method: Subjecting the swivel nozzle to a specific number of movements

Mixer	Movements	Result	
		Passed	Not passed
	80 000		

Remark: Not applicable. The mixer has an internal hose, hence there is no water pressure on the swivel joint.

4.19 Backflow protection (NS-EN 817, clause 13)

Method: EN 1717

Mixer	Result	
	Passed	Not passed
Taurus Flex 5-1	X	

Remark: The mixers are connected to the water supply via a 3-way pipe fitting with integrated check valve, see figure 3.2. The valve itself is not tested by SINTEF Community.

4.20 Acoustic characteristics (NS-EN 817, Clause 14)

Method: EN ISO 3822, Test room: V = 78 m^3, Test wall: A = 8,57 m^2 - 125 kg/m^2

Reverberation time, test room (s)					
125Hz	250Hz	500Hz	1000Hz	2000Hz	4000Hz
3,15	3,27	3,31	3,22	3,08	2,03

Mixer	Acoustic group			0,3 MPa			0,5 MPa		
				Cold	Hot	Mixed	Cold	Hot	Mixed
Taurus Flex 5-1	II	Fully open	Lap	16	16	16	24	24	25
			l/s	0,09	0,09	0,09	0,11	0,11	0,12
		Max sound pressure	Lap	20	19	21	30	29	30
			l/s	0,06	0,07	0,05	0,06	0,07	0,09

Measurement uncertainty ± 3 dB

Acoustic results are an average of 3 samples.

Remark: The tests were performed with the factory installed aerators.

4.21 Dry weight

Method: Dry weight of mixer.

Mixer	Result
	Weight [gram]
Taurus Flex 5-1	2780

Remark: Weight is without supply hoses.

Oslo, 2023-12-11
SINTEF Community

Dag Fredrik Nedberg

Dag Fredrik Nedberg
Adviser, M.Sc.

SINTEF Community

Appendix 1

NS-EN 817:2008, Clause 3.2 - Designation

Table 1	Taurus Flex 5-1
Mixer:	
Type of valve	Mechanical mixing valve
Intended use	Kitchen
Mounting method	Horizontal surface
Body	Single-hole, visible
Diverter	With diverter
Type of outlet	Sviwel spout and flexible hose with aerator
Acoustic group and classification	Group II
Water saving properties	Yes

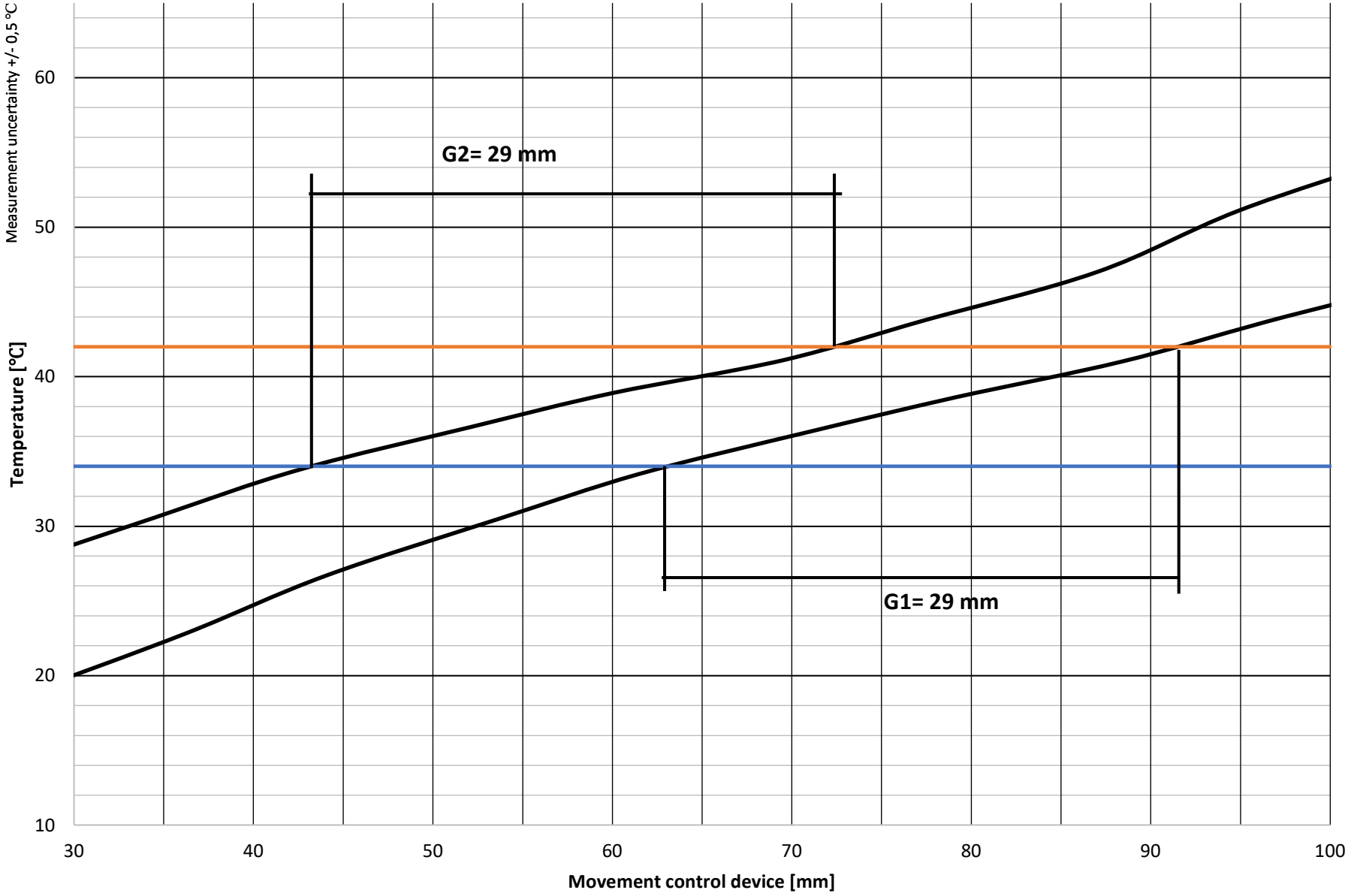
SINTEF

Appendix 2

SINTEF Community

Critical equipment - testing of Sanitary Tapware

Chapter	Test	Critical equipment	
4.5	Dimensional characteristics	Blankenholm	M5232
		Mitutoyo	M5386
4.6	Leaktightness of the mixing valve upstream of the obturator		
4.7	Leaktightness of the mixing valve downstream of the obturator		
4.8	Leaktightness of manually operated diverter		
4.10	Leaktightness of the obturator: cross flow between hot water and cold water	HBM Digibar	M3772
		SigmaLite	10443
4.9	Leaktightness and operation of diverter with automatic return	HBM P4	3777
		Heinrichs EP-P-010	3829
4.11	Mechanical behaviour upstream of the obturator	HBM Digibar	M3772
		SigmaLite	10443
4.12	Mechanical behaviour downstream of the obturator	HBM P4	3777
		Heinrichs EP-P-010	3829
4.13	Determination of flow rate		
4.14	Sensitivity	Heinrichs EP-P-008	3833 + 3834
		HBM P3IC	5811 + 5812
		MGCPlus	5594
4.15	Mechanical strength characteristics – torsion test for operating mechanism		
		Sartorius Excellence	M5032
		Mitutoyo	M5386
		Saltus	3770
		SINTEF Torque	3769
4.16	Mechanical endurance of the control device		
4.17	Mechanical endurance of diverters	UR5 Manometer	9897-9898
		20 Manometer	5520-5521
		21 Manometer	5523-5524
		22 Manometer	5525-5526
		SINTEF Torque	9796
4.18	Mechanical endurance of swivel spouts	HBM Digibar	M3772
		Sartorius Excellence	M5032
		Mitutoyo	M5386
4.20	Acoustic characteristics	Nor 140	10705
		Nor 1225	10707
		Nor 1209	10706
		Heinrichs EP-P-010	3829
		HBM P4	3777
4.21	Dry weight	Sartorius Excellence	M5032



SINTEF Community

Sensitivity
Taurus Flex 5-1