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NORSK AKKREDITERING
TEST 107

Test report

Testing of kitchen mixer from Akvatur ApS, type Taurus

Test method EN 817:2024 and EN 200:2024

SANITARY LABORATORY	**DATE** 2024-11-20
AUTHOR Geir Lippe Stavnes	**VERSION** 1
CLIENT Akvatur ApS, Lillehøjvej 23 8600 Silkeborg, Denmark	**CLIENT'S REFERENCE** Bent Iversen
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SUMMARY
SINTEF Community has on behalf of Akvatur ApS conducted testing of kitchen mixer, type Taurus.

The tests were conducted in accordance with NS-EN 817:2024 *Sanitary tapware – Mechanical mixing valves (PN 10) - General technical specification*.

Additional testing was conducted in accordance with NS-EN 200:2023 *Single taps and combination taps for water supply systems of type 1 and type 2 - General technical specification.*

See Table 4.1-4.2 for performed tests.

Result: Passed

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

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Document history

Version	Date	Version description
1	2024-11-20	Original test report

Table of contents

APPENDICES

1 INTRODUCTION

SINTEF Community has on behalf of Akvatur ApS conducted testing of kitchen mixer, type Taurus.

The tests according to NS-EN 817 and NS-EN 200 were performed by Geir Lippe Stavnes (Research engineer). The tests were performed in the Sanitary lab. (U47) between 2024-10-08 and 2024-11-19.

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 817:2024 *Sanitary tapware – Mechanical mixing valves (PN 10) - General technical specification*.

Additional tests were performed in accordance with NS-EN 200:2023 Sanitary tapware – Single taps and combination taps for water supply systems of type 1 and type 2 - General technical specification.

See Table 4.1-4.2 for performed tests.

3 TEST OBJECT

The test object from Akvatur ApS is a single lever kitchen mixer with additional valve and integral outlet for boiling water, see Table 3.1 and Figure 3.1. The mixers were delivered with flexible hoses from Neoperl. The boiling water tank is not part of this test.

The samples are produced by Akvatur ApS and were delivered to SINTEF Community on 2024-10-08. They were selected by the customer and in good condition on arrival.

Table 3.1: Controlled mixers

Mixer	Designation	Aerator	Cartridge	Quantity	Figure
Taurus	Appendix 1, Table 1	Unmarked	Sedal 35mm	3	3.1

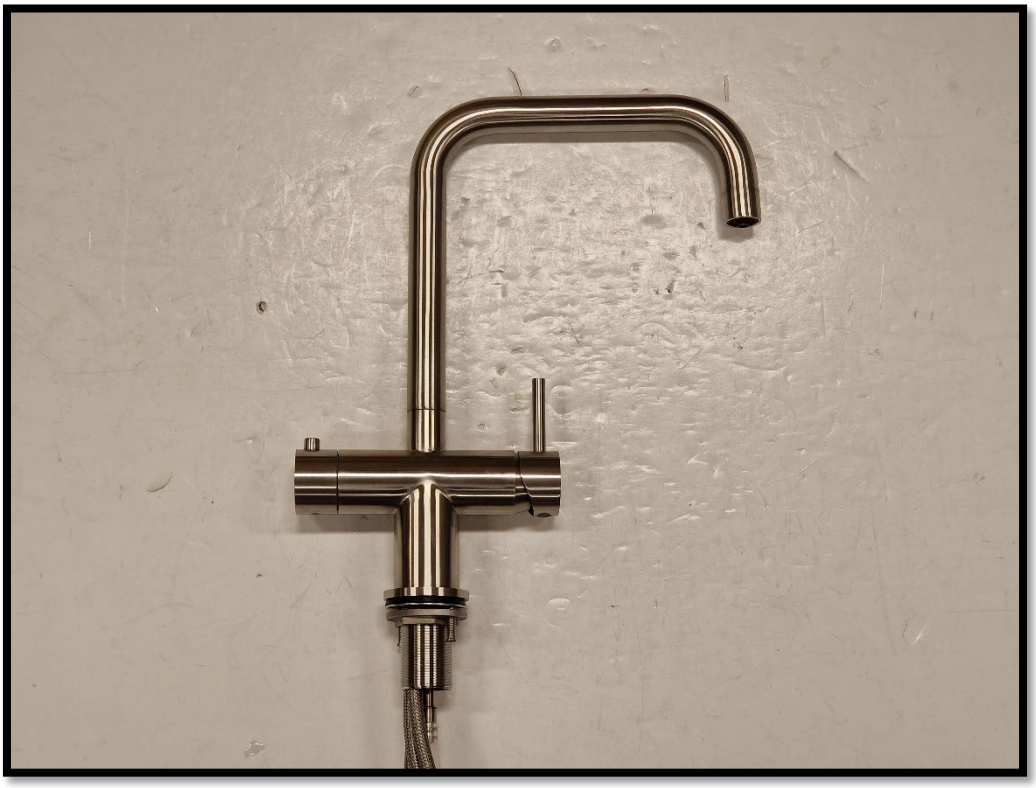

Fig. 3.1:Taurus

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	5.1	Marking	X		X	
4.2	5.2.2	Identification of inlets	X		X	
4.3	5.2.2	Identification of control device	X		X	
4.4	6.1	Chemical and hygiene requirements	- [2)]		X	
4.5	6.2	Exposed surface conditions	- [2)]			X
4.6	7	Backflow protection	X			X
4.7	9	Dimensional characteristics	X		X	
4.8	10.3	Leaktightness upstream of the obturator in the closed position	X		X	
4.9	10.4	Leaktightness downstream of the obturator	X		X	
4.10	10.5	Leaktightness of manually operated diverters	- [1)]		X	
4.11	10.6	Leaktightness and operation of diverters with automatic return	- [1)]		X	
4.12	10.7	Cross flow between inlets	X		X	
4.13	11.3	Mechanical behaviour upstream of the obturator	X		X	
4.14	11.4	Mechanical behaviour downstream of the obturator	X		X	
4.15	12.3	Determination of flow rate	X		X	
4.16	12.4	Determination of sensitivity	X		X	
4.17	13.3.2	Mechanical strength/torsional resistance – on/off mechanism	X		X	
4.18	13.3.3	Mechanical strength/torsional resistance – temperature control	X		X	
4.19	14.2	Endurance of conventional control devices	X		X	
4.20	14.3	Endurance of joystick control devices	- [1)]		X	
4.21	14.6.1	Endurance test of diverter mechanisms – manual diverter	- [1)]		X	
4.22	14.6.2	Endurance test of diverter mechanisms – automatic return	- [1)]		X	
4.23	14.7	Endurance test for swivel spouts	X		X	
4.24	15	Acoustic characteristics	X		X	
4.25		Dry weight	X			X

Table 4.2 Summary of results

Chapter	Clause in NS-EN 200	Property	Passed		Accredited test	
			Yes	No	Yes	No
4.26	10.3	Leaktightness with the obturator in the closed position	X		X	
4.27	10.4	Leaktightness downstream of the obturator	X		X	
4.28	11.3	Mechanical behaviour upstream of the obturator	X		X	
4.29	11.4	Mechanical behaviour downstream of the obturator	X		X	
4.30	13	Mechanical strength characteristics – torsion test for operating mechanism	X		X	
4.30	14.2	Endurance test for on/off control devices by rotating the control handle	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	X	

Remark: The mixers are marked “Taurus”.

4.2 Identification of inlets (NS-EN 817, Clause 5.2.1)

Method: Visual inspection

Mixer	Result	
	Passed	Not passed
Taurus	X	

Remark: The inlets are marked blue for cold water and red for hot water.

4.3 Identification of control devices (NS-EN 817, Clause 5.2.2)

Method: Visual inspection

Mixer	Result	
	Passed	Not passed
Taurus	X	

Remark: The mixers are marked red/blue on the lever.

4.4 Chemical and hygienic characteristics (NS-EN 817, Clause 6.1)

Method: NKB 4, Clause 3.3.2

Mixer	Result	
	Passed	Not passed

Remark: Not considered

4.5 Exposed surface conditions (NS-EN 817, Clause 6.2)

Method: EN 248

Mixer	Result	
	Passed	Not passed

Remark: Not considered.

4.6 Backflow protection (NS-EN 817, Clause 7)

Method: EN 1717

Mixer	Result	
	Passed	Not passed
Taurus	X	

Remark: There is an airgap between the outlet and the highest level of sink.

4.7 Dimensional characteristics (NS-EN 817, Clause 9)

Method: Measurement and visual inspection

Mixer	Result	
	Passed	Not passed
Taurus	X	

4.8 Leaktightness of the obturator in the closed position (NS-EN 817, Clause 10.3)

Method: Outlet orifice open and the obturator closed

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

4.9 Leaktightness downstream of the obturator (NS-EN 817, Clause 10.4)

Method: Outlet orifice closed and the obturator open

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

4.10 Leaktightness of manually operated diverters (NS-EN 817, Clause 10.5)

Method: Outlet orifice closed and the obturator open

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

Remark: Not applicable

4.11 Leaktightness and operation of diverters with automatic return (NS-EN 817, Clause 10.6)

Method: Flow to bath and bath to flow

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

Remark: Not applicable

4.12 Cross flow between inlets (NS-EN 817, Clause 10.7)

Method: Outlet orifice open and the obturator closed

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

4.13 Mechanical behaviour upstream of the obturator (NS-EN 817, Clause 11.3)

Method: Outlet orifice open and the obturator closed

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

4.14 Mechanical behaviour downstream of the obturator (NS-EN 817, Clause 11.5)

Method: Outlet orifice open and the obturator open

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

4.15 Determination of flow rate (NS-EN 817, Clause 12.3)

Method: Measuring the flow rate at 0,3 MPa

Mixer	Result	
	Passed	Not passed
Taurus	X	

Remark: No requirements for kitchen mixers. The recommended flow rates measured at 0,3 MPa are listed in EN 817:2024, Annex C.

Table 4.3 Measured flow rate

Taurus	Flow rate [l/s]	Recommended flow rate	
	0,3 MPa	Passed	Not passed
Fully open cold water	0,145		X
34 °C	0,164	X	
38 °C	0,164	X	
44 °C	0,164	X	
Fully open hot water	0,138		X

Measurement uncertainty ± 2 %

Remark: The tests were performed with factory installed aerator.

4.16 Determination of sensitivity (NS-EN 817, Clause 12.4)

Method: Measuring the sensitivity at 0,3 MPa

Mixer	Result	
	Passed	Not passed
Taurus	X	

Remark: See Appendix 3.

4.17 Mechanical strength/torsional resistance – On/off mechanism (NS-EN 817, Clause 13.3.2)

Method: Subjecting the handle to a given torque

Mixer	Torque [Nm]	Result	
		Passed	Not passed
Taurus	6	X	

4.18 Mechanical strength/torsional resistance – temperature control (NS-EN 817, Clause 13.3.3)

Method: Subjecting the handle to a given torque

Mixer	Torque [Nm]	Result	
		Passed	Not passed
Taurus	3	X	

4.19 Endurance of conventional control devices (NS-EN 817, Clause 14.2)

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

Mixer	Movements	Result	
		Passed	Not passed
Taurus	70 000	X	

4.20 Endurance test of joystick control devices (NS-EN 817, Clause 14.3)

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

Mixer	Movements	Result	
		Passed	Not passed
	70 000		

Remark: Not applicable

4.21 Endurance test of diverter mechanisms – Manual diverters (NS-EN 817, Clause 14.6.1)

Method: Subjecting the diverter to a specific number of movements

Mixer	Movements	Result	
		Passed	Not passed
	30 000		

Remark: Not applicable

4.22 Endurance test of diverter mechanisms – Diverters with automatic return (NS-EN 817, Clause 14.6.2)

Method: Subjecting the diverter to a specific number of movements

Mixer	Movements	Result	
		Passed	Not passed
	30 000		

Remark: Not applicable.

4.23 Endurance for swivel spouts (NS-EN 817, clause 14.7)

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

Mixer	Movements	Result	
		Passed	Not passed
Taurus	80 000	X	

4.24 Acoustic characteristics (NS-EN 817, Clause 15)

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	II	Fully open	Lap	21	20	21	25	24	25
			l/s	0,15	0,14	0,16	0,19	0,18	0,21
		Max sound pressure	Lap	21	20	21	25	24	25
			l/s	0,15	0,14	0,16	0,19	0,18	0,21

Measurement uncertainty ± 3 dB

Acoustic results are an average of 3 samples.

The test was carried out with the factory installed aerator

4.25 Dry weight

Method: Dry weight of mixer without connecting hose or copper pipe

Mixer	Result
	Weight [gram]
Taurus	1757

Remark: Weight is with supply hoses.

4.26 Leaktightness with the obturator in the closed position (NS-EN 200, Clause 10.3)

Method: Outlet orifice open and the obturator closed

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

4.27 Leaktightness downstream of the obturator (NS-EN 200, Clause 10.4)

Method: Outlet orifice closed and the obturator open

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

4.28 Mechanical behaviour upstream of the obturator (NS-EN 200, Clause 11.4)

Method: Outlet orifice open and the obturator closed

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

4.29 Mechanical behaviour downstream of the obturator (NS-EN 200, Clause 11.5)

Method: Outlet orifice open and the obturator open

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

4.30 Mechanical strength characteristics - torsion test for operating mechanism (NS-EN 200, Clause 13)

Method: Subjecting the handle to a given torque

Mixer	Torque [Nm]	Result	
		Passed	Not passed
Taurus	6	X	

4.31 Endurance test for on/off control devices by rotating the control handle (NS-EN 200, Clause 14.2)

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

Mixer	Movements	Result	
		Passed	Not passed
Taurus	200 000	X	

Oslo, 2024-11-20
SINTEF Community

Geir Lippe Stavnes
Research Engineer

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Appendix 1

NS-EN 817:2008, Clause 3.2 - Designation

Table 1	Taurus
Mixer:	
Type of valve	Mechanical mixing valve
Intended use	Kitchen sink
Mounting method	Horizontal surface
Body	Single-hole, visible
Diverter	Without separate valve for boiling water
Type of outlet	Sviwel spout with aerator
Acoustic group and classification	Group II
Water saving properties	No

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Critical equipment - testing of Sanitary Tapware

Chapter	Test	Critical equipment	
4.7	Dimensional characteristics	Blankenholm	M5232
		Mitutoyo	M5386
4.8	Leaktightness of the mixing valve upstream of the obturator		
4.9	Leaktightness of the mixing valve downstream of the obturator		
4.12	Leaktightness of the obturator: cross flow between hot water and cold water	HBM Digibar	M3772
		SigmaLite	10443
4.13	Mechanical behaviour upstream of the obturator	HBM Digibar	M3772
		SigmaLite	10443
4.14	Mechanical behaviour downstream of the obturator	HBM P4	3777
		Heinrichs EP-P-010	3829
4.15	Determination of flow rate		
4.16	Sensitivity	Heinrichs EP-P-008	3833 + 3834
		HBM P3IC	5811 + 5812
		MGCPlus	5594
4.17	Mechanical strength characteristics – torsion test for operating mechanism		
		Sartorius Excellence	M5032
		Mitutoyo	M5386
		Saltus	3770
		SINTEF Torque	3769
4.19	Mechanical endurance of the control device		
		UR5 Manometer	9897-9898
4.23	Mechanical endurance of swivel spouts	HBM Digibar	M3772
		Sartorius Excellence	M5032
		Mitutoyo	M5386
4.24	Acoustic characteristics	Nor 140	10705
		Nor 1225	10707
		Nor 1209	10706
		Heinrichs EP-P-010	3829
		HBM P4	3777
4.25	Dry weight	Sartorius Excellence	M5032
4.26	Leaktightness of the mixing valve upstream of the obturator		
4.27	Leaktightness of the mixing valve downstream of the obturator	HBM Digibar	M3772
		SigmaLite	10443
4.28	Mechanical behaviour upstream of the obturator	HBM Digibar	M3772
		SigmaLite	10443
4.29	Mechanical behaviour downstream of the obturator	HBM P4	3777
		Heinrichs EP-P-010	3829
4.30	Mechanical strength characteristics – torsion test for operating mechanism		
		SINTEF Torque	3769
4.31	Mechanical endurance characteristics of the operating mechanism		
		22 Manometer	5525-5526

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Appendix 3