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Test 107

Test report

Testing of kitchen mixers from Akvatur ApS, type Taurus 3-1 Flex

Test method EN 817:2008

SANITARY LABORATORY	**DATE** 2021-10-12
AUTHOR Dag Fredrik Nedberg	**VERSION** 1
CLIENT Akvatur ApS, Lillehøjvej 23, 8600 Silkeborg, Denmark	**CLIENT'S REFERENCE** Bent Iversen
PROJECT NO. 102000264-649	**NUMBER OF PAGES**: 12 + 3 Appendices

SUMMARY
SINTEF Community has on behalf of Akvatur ApS conducted testing of kitchen mixers with additional connection and closing valve for boiling water tank, type Taurus 3-1 Flex.

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

Supplementary testing of the closing valve for boiling water tank was conducted in accordance with NS-EN 200:2008 "*Sanitary tapware – Single taps and combination taps for water supply systems of type 1 and 2 - General technical specification*", Clause 12.1

See Table 4.1 for conducted tests.

Result: Passed

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APPENDICES

1 INTRODUCTION

SINTEF Community has on behalf of Akvatur ApS conducted testing of kitchen mixers, type Taurus 3-1 Flex.

The tests according to EN 817 and EN 200 were conducted by Dag Fredrik Nedberg (M.Sc.). The tests were performed in the Sanitary lab. (U47) between 2021-08-20 and 2021-10-01.

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 conducted in accordance with:
EN 817:2008 "*Sanitary tapware – Mechanical mixing valves (PN 10) - General technical specification*".
EN 200:2008 "*Sanitary tapware – Single taps and combination taps for water supply systems of type 1 and 2- General technical specification*", Clause 12.1

See Table 4.1 for conducted tests.

3 TEST OBJECT

The test objects from Akvatur ApS are kitchen mixers with additional connection and closing valve for boiling water tank, see Table 3.1 and Figure 3.1. The mixers were delivered with flexible hoses from Yuhuan Yaoyao Metal Hose Co., Ltd.

The mixers are manufactured by Eloira Sanitary Ware Co., Ltd. No. 68, West Longtang Rd., Shuikou Town, Kaiping, Guangdong, China. The mixers were delivered to SINTEF Community on 2021-08-20. They were selected by the customer and in good condition on arrival.

Table 3.1: Controlled mixers

Mixer	Designation	Aerator	Quantity	Figure
Taurus 3-1 Flex	Appendix 1, Table 1	Unmarked	3	3.1

Fig. 3.1: Taurus 3-1 Flex

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	- [1)]		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	- [1)]		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

Chapter	Clause in NS-EN 200	Property	Passed		Accredited test	
			Yes	No	Yes	No
4.22	12.1	Mechanical endurance of the control device	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 3-1 Flex	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 3-1 Flex	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 3-1 Flex	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 3-1 Flex	1,6	X	
Taurus 3-1 Flex – Closing valve for boiling water tank	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 3-1 Flex	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
	0,4		

Remark: Not applicable

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 3-1 Flex	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 3-1 Flex	2,5	X	
Taurus 3-1 Flex – Closing valve for boiling water tank	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 3-1 Flex	0,4	X	
Taurus 3-1 Flex – Closing valve for boiling water tank	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 3-1 Flex	X	
Taurus 3-1 Flex - Closing valve for boiling water tank	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 3-1 Flex

	Flow rate [l/s]			Result	
	0,1 MPa	0,3 MPs	0,5 MPa	Passed	Not passed
Fully open cold water	0,05	0,09	0,12	X	
34 °C	0,06	0,11	0,14	X	
38 °C	0,06	0,11	0,14	X	
42 °C	0,06	0,11	0,14	X	
Fully open hot water	0,05	0,09	0,12	X	

Measurement uncertainty ± 2 %

Table 4.3 Measured flow rate – Taurus 3-1 Flex - Closing valve for boiling water tank

	Flow rate [l/s]			Result	
	0,1 MPa	0,3 MPs	0,5 MPa	Passed	Not passed
Fully open cold water	0,05	0,10	0,12	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 3-1 Flex	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 3-1 Flex	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 3-1 Flex	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
	30 000		

Remark: Not applicable

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 swivel spout 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 3-1 Flex	X	

Remark: The mixers are equipped with a check valve on the outlet. The valve itself is not tested by SINTEF Community.

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

Method: EN ISO 3822

Mixer	Acoustic group			0,3 MPa			0,5 MPa		
				Cold	Hot	Mixed	Cold	Hot	Mixed
Taurus 3-1 Flex	I	Fully open	Lap	10	10	9	13	13	11
			l/s	0.09	0.09	0.11	0.12	0.12	0.14
		Max sound pressure	Lap	10	10	9	13	13	11
			l/s	0.09	0.09	0.11	0.12	0.12	0.14
Taurus 3-1 Flex - Closing valve for boiling water tank	I	Fully open	Lap	9	-	-	-	-	-
			l/s	0.10	-	-	-	-	-
		Max sound pressure	Lap	9	-	-	-	-	-
			l/s	0.10	-	-	-	-	-

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 without connecting hose or copper pipe

Mixer	Result
	Weight [gram]
Taurus 3-1 Flex	2258

4.22 Mechanical endurance of the control device (NS-EN 200, Clause 12.1)

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

Mixer	Movements	Result	
		Passed	Not passed
Taurus 3-1 Flex – Closing valve for boiling water tank	200 000	X	

Oslo, 2021-10-12
SINTEF Community

Dag Fredrik Nedberg

Dag Fredrik Nedberg
Advisor, M.Sc.

SINTEF Community

Appendix 1

NS-EN 817:2008, Clause 3.2 - Designation

Table 1	Taurus 3-1 Flex
Mixer:	
Type of valve	Mechanical mixing valve
Intended use	Kitchen with additional boiling water tank
Mounting method	Horizontal surface
Body	Single-hole, visible
Diverter	Without diverter
Type of outlet	Pull-out spray
Acoustic group and classification	Group I
Water saving properties	Yes

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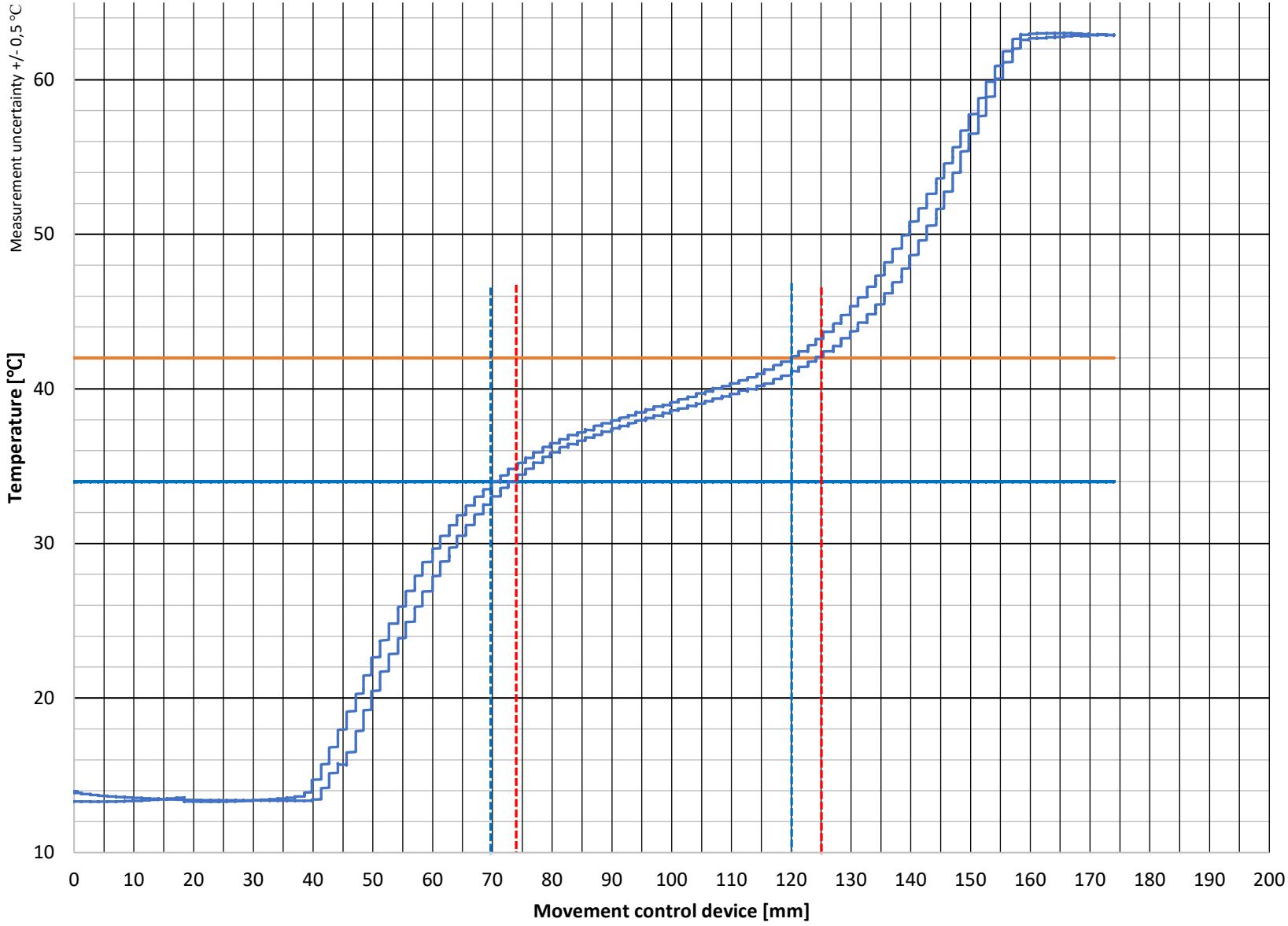
Appendix 2

Applied equipment - testing of Sanitary Tapware

		Equipment no.	*Type*
Capacity	Grundfos CR16-120		Pump
	Grundfos CR2		Pump
	Grundfos CR3		Pump
	Grundfos CR4		Pump
	Grundfos CRE4		Pump
	Heinrichs EP-H-309/UMF	3830 + 3832	Flow meter
	Heinrichs EP-P-010/UMF	3829 + 3831	Flow meter
	Heinrichs EP-P-008/UMF	3833 + 3834	Flow meter
Temperature	NBI Prod. Temp - Channel 40-45		Temperature sensor
	HMP233	M5335	Temperature sensor
Tightness	Leva M3 + P15RVA	M5344	Pump and pressure meter
	HMB Typ P4	M5807-5810	Pressure meter
	HBM/WE2108	M5332	Pressure meter
	HBM 1-TG001E	-	Logger/amplifier
	Kulite XTL-190SM-15BARA	4205	Pressure meter
	HBM P3IC	5811 + 5812	Pressure transducer
	Druck PDCR 830	M5719	Pressure meter
Measurements	Saltuz DAZ	M5650	Torque meter
	NBI Prod. Torque	M6043	Torque meter
	Blankenholm thread gauges	M5232	Thread gauge
	Mitutoyo	M5386	Slide gauge
Acoustics	Norsonic environmental analyser 121	M5502	Sound analyser
	Norsonic environmental analyser 140		Sound analyser
	Norsonic sound calibrator type 1251	M5238	Calibrator
	Norsonic type 1201/14385		Microphone
Scales	Mettler AE 260 Deltarange	M5063	Scale
	Mettler PE 1600	M4906	Scale
	Sartorius Excellence	M5032	Scale
Misc.	Metrohm 794 Basic Titrino	M5950	pH meter
	HP3497A +HBM AE3407	M5655	Logger and amplifier
	Agilent Tech. A34980A + HBM AE3407	M5612	Logger and amplifier
	Omron	M6043	Motor/angular



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Sensitivity
Taurus 3-1

Appendix 3