TECHNICKÝ SKÚŠOBNÝ® ÚSTAV PIEŠŤANY, š.p.

Krajinská cesta 2929/9, 921 01 Piešťany, Slovenská republika

SNAS Reg. No. 009/S-047

Skúšobňa TSÚ - Skúšobňa strojov a výrobných zariadení

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Test report No.: 184000083

Test name:	Test of hydraulic properties
Subject of testing:	IPS Kalyxx RedLine
Type:	Kalyxx
Manufacturer:	Swiss Aqua Technologies SK s.r.o. Šebastovská 2 080 06 Prešov Slovak Republic
Customer – Applicant:	Swiss Aqua Technologies SK s.r.o. Šebastovská 2 080 06 Prešov Slovak Republic
Nr. of order:	184000083
Testing place:	TSÚ Piešťany, š.p. Krajinská cesta 2929 92101 Piešťany Slovak Republic
Test – procedure method:	MPS 316/501.
Date of test performance:	05.04.2018 - 17.04. 2018
Distribution:	1 x – customer 1 x – TSU (SSVZ)
Date of issue:	17. 04. 2018

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-316-

Tested and elaborated by: **Ing. Stanislav Zámečník**, Test engineer

Checked and approved by: **Ing. Mário Zemko**, Technical manager of Testing Body

1. Measuring equipment and test facilities:

- Mechanical stopwatch, id. 210-316-002
- Caliper, id. 210-316-026
- Flow meter KROHNE IFS 4000/6, id. 330-316-012
- Calibrated testing vessel 1L
- Logger ALMEMO 2890-8, id. H09080221
- Temperature sensor T190-0 typ K, id. 140-316-010
- Pressure sensor DMP331, id. 120-316-051
- Pressure sensor DMP333, id. 120-316-050
- Differential pressure sensor DMD33, id. 120-316-052
- Digital thermohygrobarometer C4130, id. 412-316-001

2. Test methods:

MPS 316/501

Deviations, exceptions from test methods: none
The estimated uncertainty of measurement: unasked

3. Testing conditions:

$t_{ambient}$ = 21,1 °C
t_{watter} = 19,4 °C
RH = 60 %
p_{bar} = 1012 hPa

4. Test sample:

1 piece of IPS Kalyxx RedLine, id. 4A /18. The samle was submitted for testing to TSÚ Piešťany, š.p. on March 15, 2018. The sample was received by Ing. Zemko.

Connection type: G1/2" (on both sides)

5. Sample description:

The device is designed for the physical treatment of water. Prevents formation of limescale and corrosion. It also helps to remove them. IPS can be installed in closed and open dynamic systems.

Picture 1 IPS RedLine

6. Finding of facts, result of inspection, meassure, test & finding

6.1 Determination of pressure losses

The pressure losses were determined by water with temperature of 19,4° C and ambient temperature of 21,1° C.

$$\Delta p = a.m^2 + b.m$$

The following coefficients were determined by regression analysis from the measured values:

a = 547,82 (Pa.s^2)/l^2

b = 4,3295 (Pa.s)/l

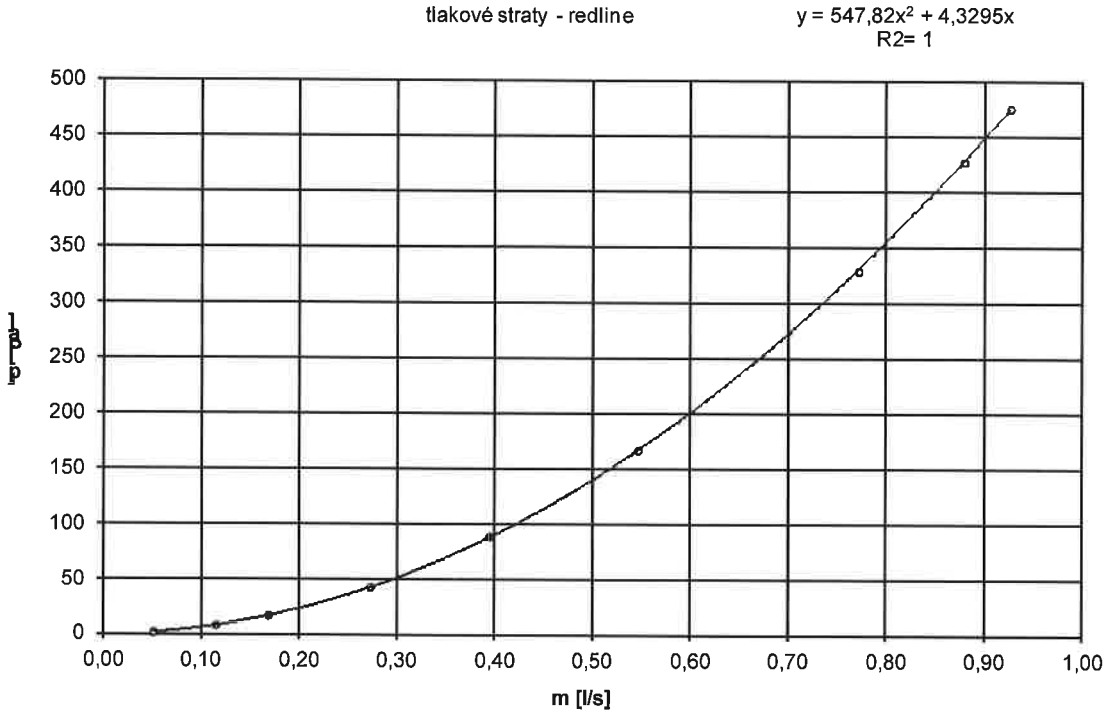


Table of measured values:

Flow (l/s)	0	0,0510	0,115	0,169	0,273	0,395	0,547	0,772	0,879	0,926
Pressure losses (Pa)	0	1,4	7,9	16,3	42,2	88,1	166,2	328,3	426,6	475,1

6.2 Pressure resistance

During the pressure resistance test, the product was exposed to 1.5x of nominal pressure (for 5 minutes) - nominal pressure declared by the manufacturer is 1MPa (1.5x1MPa).

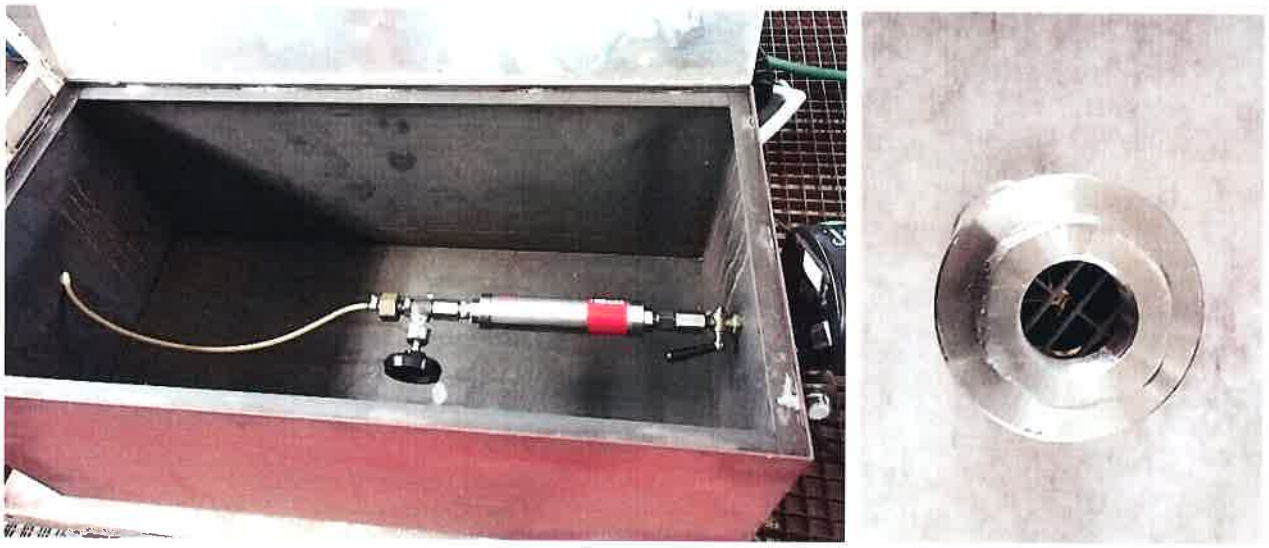
The product did not show signs of damage during the test and no leakage was detected.

6.3 Strength

The target of strength test was verifying that the product is capable to resist pressure of 1, 5 and 10 MPa. Another requirement was to measure (before and after the test) the distance between the inner component (propeller) and the inlet and determine if there is deformation effects during the test.

The product was clamped in the test cabinet and subsequently exposed to the required pressure.

During the test, the product showed no signs of damage and no leakage was detected. The distance between the center of the first component and the input section remained unchanged – 27,7 mm.



Picture 2 IPS RedLine in the test cabinet and during distance measurement.

End of the test report