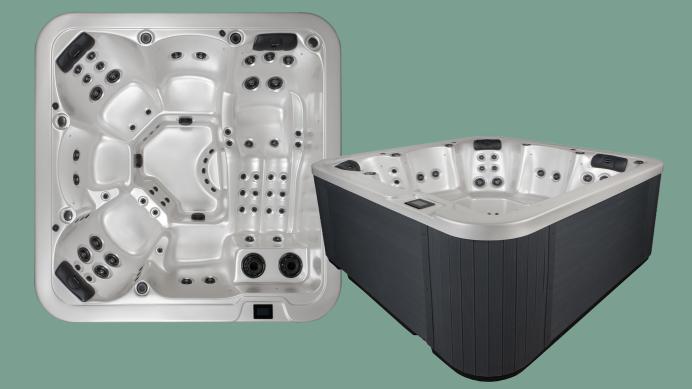
NOVITEK[®]

Consumption Test for Outdoor Hot Tubs

37.5





What? 230 cm).

Consumption measurements have been carried out in laboratory conditions, which means that external factors have been established for the entirety of the test.

How? Tubs:

- Tub.

What? How? Where?

We sent two different Hot Tub sizes for consumption measurements. A Novitek Luosto outdoor Hot Tub (190 x 190 cm), and a Malla outdoor Hot Tub (230 x

• Two different tests were performed on both Hot

- » Test 1: 72h test in "Ready" mode, with the Spa cover closed.
- » Test 2: 1h bathing simulation test, where the Spa cover was off, the Hot Tubs massages were on for 2 x 15 min and off for 2 x 15 min.

• The measurements were started when the Hot Tubs had reached the optimal temperature of 37°C. • The Hot Tubs were filled to match the normal filling height, 135mm measured from the top of the Hot

• The settings of the Hot Tubs were at the factory settings.

Where?

Tampere University, HV laboratory Tekniikankatu 8 33720 Tampere

The Hot Tub models Tested

Luosto 2.0



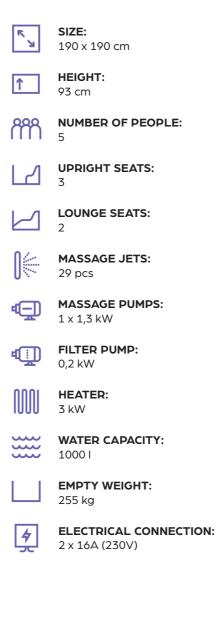
Isolation

- Walls 30mm FF-PIR
- Bottom 50mm FinnFoam XPS + 30mm FF-PIR = 80mm total isolation

What FF-PIR?

- Domestic polyurethane insulation with very effective thermal insulation capacity, thermal conductivity (lambda) Declared is 0.022 W/mK, which enables thinner insulation thicknesses.
- Completely Moisture resistant and mold-proof. The thermal insulation does not deteriorate due to convection (temperature variation) or humidity.
- The chemical resistance is very good as well
- Resistant to solvents, plasticizers, and mineral oils. •

Technical information





Malla



Isolation

- Walls 30mm FF-PIR
- Bottom 50mm FinnFoam XPS + 30mm FF-PIR = • 80mm total isolation

What FF-PIR?

- Domestic polyurethane insulation with very effective thermal insulation capacity, thermal conductivity (lambda) Declared is 0.022 W/mK, which enables thinner insulation thicknesses.
- Completely Moisture resistant and mold-proof. The thermal insulation does not deteriorate due to convection (temperature variation) or humidity.
- The chemical resistance is very good as well
- Resistant to solvents, plasticizers, and mineral oils. •

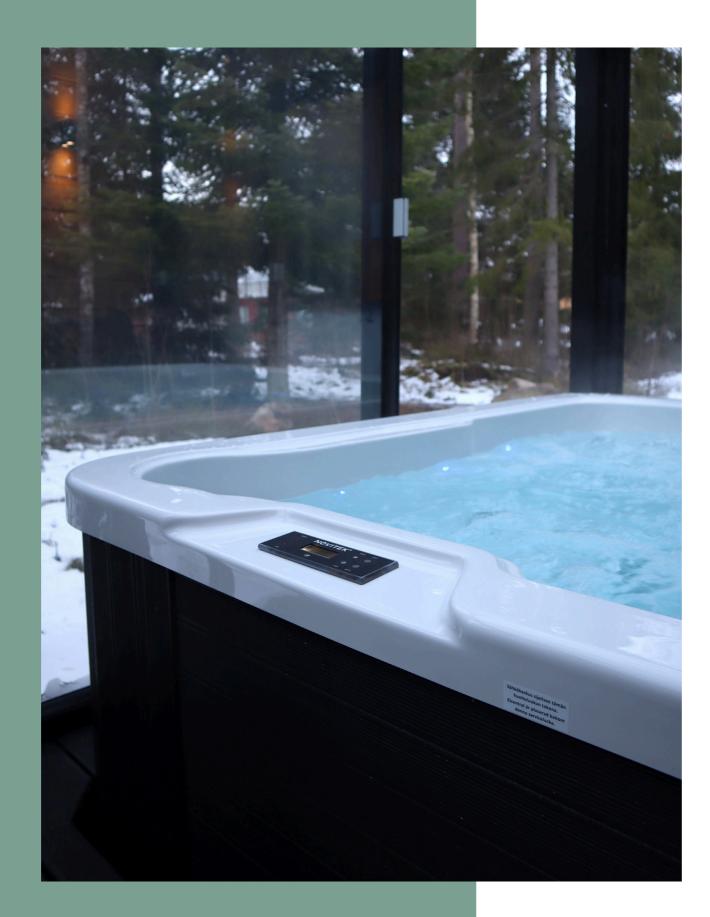
Technical information

к У	SIZE: 230 x 230 cm
1	HEIGHT: 102 cm
ണ്ണ	NUMBER OF PEOPLE:
	UPRIGHT SEATS: 5
	LOUNGE SEATS: 1
]	MASSAGE JETS: 64 pcs
۹ <u>ب</u>	MASSAGE PUMPS: 3 x 1,5 kW
۹ پ	FILTER PUMP: 0,3 kW
$\mathbb{N}\mathbb{N}$	HEATER: 3 kW
	WATER CAPACITY 1700 I
	EMPTY WEIGHT: 380 kg

4

ELECTRICAL CONNECTION: 3 x 16A (400V)





LUOSTO test results: kWh

2 x 15 min.

• Ambient temperature 6,5°C (Average temperature, Helsinki 2021) • Hot Tub water temperature 37°C

Test. 1 Base consumption

Hot Tub in "Ready" mode, with the Spa cover closed.

6,55 kWh / 24h

Test. 2 Bathing simulation

1h bathing simulation test, where the Spa cover was off, the Hot Tubs massages were on for 2 x 15 min and off for

3,15 kWh / 1h

Examples of Consumption

Basic Consumption

Yearly consumption with the cover being closed.

Consumption 2390 kWh / year

So to say "Week use"

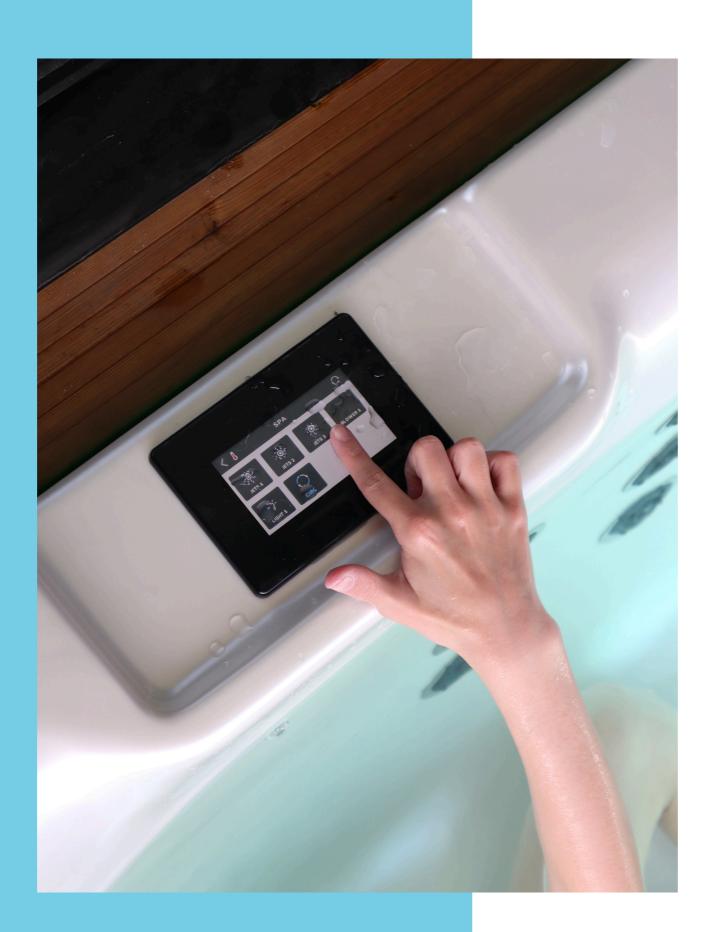
A family uses the Hot Tub 1 x 1h weekly. The Jets are on for 30min during this time.

Consumption 2554 kWh / year

Active use

A family uses the Hot Tub 3 x 2h weekly. The Jets are on for 60min during every session.

Consumption 3373 kWh / year



MALLA test results **kWh**

1h bathing simulation test, where the Spa cover was off, the Hot Tubs massages were on for 2 x 15 min and off for 2 x 15 min.

Examples of Consumption

So to say "Week use" A family uses the Hot Tub 1 x 1h weekly. The Jets are on for 30min during this time.

Active use A family uses the Hot Tub 3 x 2h weekly. The Jets are on for 60min during every session.

• Ambient temperature 6,5°C (Average temperature, Helsinki 2021) • Hot Tub water temperature 37°C

Test. 1 Base consumption

Hot Tub in "Ready" mode, with the Spa cover closed.

8,23 kWh / 24h

Test. 2 Bathing simulation

3,43 kWh / 1h

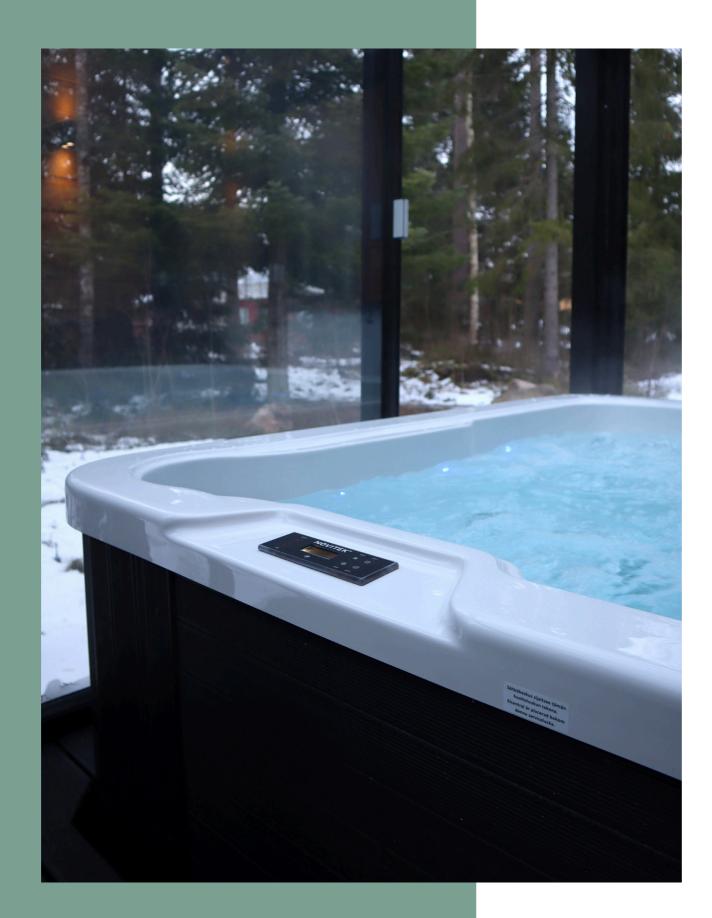
Basic Consumption

Yearly consumption with the cover being closed.

Consumption 3003 kWh / year

Consumption 3182 kWh / year

Consumption 4074 kWh / year



LUOSTO test results in euros €

Consumption 545 € / year

So to say" Week use" A family uses the Hot Tub 1 x 1h weekly. The Jets are on for 30min during this time.

Active use

Calculations made with electrical stock market value:

The July 2022 spot electricity average price of 22.83 cents/kWh, VAT 24% included, electricity transfer price excluded.

Test. 1 Basic Consumption

Hot Tub in "Ready" mode, with the Spa cover closed.

1,5€/24h

Test. 2 Bathing simulation

1h bathing simulation test, where the Spa cover was off, the Hot Tubs massages were on for 2 x 15 min and off for 2 x 15 min.

0,72€/1h

Consumption Examples

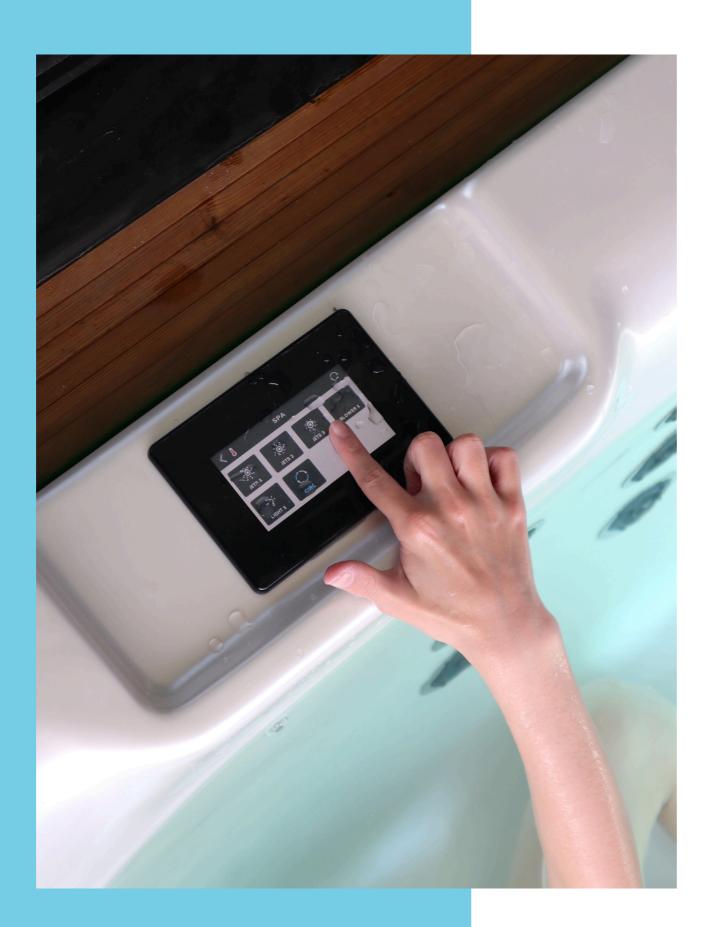
Basic Consumption

Yearly consumption with the cover closed

Consumption 583 € / year

A family uses the Hot Tub 3 x 2h weekly. The Jets are on for 60min during every session.

Consumption 770 € / year



MALLA test results in euros €

Consumption 685 € / year

So to say" Week use" A family uses the Hot Tub 1 x 1h weekly. The Jets are on for 30min during this time.

Active use

Calculations made with electrical stock market value:

The July 2022 spot electricity average price of 22.83 cents/kWh, VAT 24% included, electricity transfer price excluded.

Test. 1 Basic Consumption

Hot Tub in "Ready" mode, with the Spa cover closed.

1,88 € / 24h

Test. 2 Bathing simulation

1h bathing simulation test, where the Spa cover was off, the Hot Tubs massages were on for 2 x 15 min and off for 2 x 15 min.

0,78 € / 1h

Consumption Examples

Basic Consumption

Yearly consumption with the cover closed.

Consumption 726 € / year

A family uses the Hot Tub 3 x 2h weekly. The Jets are on for 60min during every session.

Consumption 930 € / year

LUOSTO – test certificate

Tampere University

			p. 1 (1
Test report	TAU-01522		
Test ordered by	Oy Nordic Spa Ltd.		
Device tested	Outdoor spa of the following model: - Luosto manufactured by Oy Nordic Spa Ltd. The tested spa was manufactured in 2022.		
Test(s) Description/specification	 Energy consumption measurements (T_{outdoor}=6.5°C, T_{water}=37°C) Test 1: 72 h test in 'Ready' -mode with spa cover on, (EN27125) Test 2: 1 h Bath simulation test, (customer specification; spa cover off, water jets 2*15min ON, 2*15min OFF) (both tests detailed in full test report TAU-01222) 		
Test location	Tampere University, HV laboratory Tekniikankatu 8, 33720 Tampere, Finland		
Test Result	Spa	Test 1: Average consumption in 'Ready' -mode	Test 2: Bath simulation test, 1 h
	Luosto	6.55 kWh/24 h	3.15 kWh/1 h
Tested/verified by	June 20, 2022, Kari Lahti, D.Sc. (Tech.) Senior Scientist Head of the TAU HV laboratory		
Test laboratory	Tampere University, ITC/Elecrical engineering, HV laboratory Korkeakoulunkatu 3, 33720 Tampere, Finland		
Notes	The test details are indicated in the full test report TAU-01122		
This test report re	ates only on the inc	licated test samples. Partial copying of	this report is not allowed.

POSTAL ADDRESS TELEPHONE TAU/ Electrical Engineering Korkeakoulunkatu 3 +358 294 5211 FIN-33720 TAMPERE, FINLAND

WEB

www.tuni.fi

MALLA – test certificate

Tampere University

Test report	TAU-01622		
Test ordered by	Oy Nordic Spa Ltd.		
Device tested	Outdoor spa of the follow - Malla ma The tested spa was man		
Test(s) Description/specification	Energy consumption (T _{outdoor} =6.5°C, T _{water} =37° Test 1: 72 h test in 'Read Test 2: 1 h Bath simulati cover off, water (both tests detailed in fu		
Test location	Tampere University, HV Tekniikankatu 8, 33720 1		
Test Result	Spa	Tes Average co in 'Ready	
	Malla	8.23 kW	
Tested/verified by	June 20, 2022,		
Test laboratory	Tampere University, ITC/ Korkeakoulunkatu 3, 337		
Notes	The test details are indic		
This test report rela	ates only on the inc	licated test sampl	

POSTAL ADDRESS TAU/ Electrical Engineering Korkeakoulunkatu 3 FIN-33720 TAMPERE, FINLAND TELEPHONE +358 294 5211

	p. 1 (1)
owing model: anufactured by Oy Nordic Spa Ltd. nufactured in 2022.	
on measurements	
^{ro} C) ady' -mode with spa cover on, (EN27125) tion test, (customer specification; spa r jets 2*15min ON, 2*15min OFF) ull test report TAU-01222)	
laboratory Tampere, Finland	
est 1: Test 2: onsumption Bath simulation test, 1 h dy'-mode	1
Wh/24 h 3.43 kWh/1 h	
Kari Lahti, D.Sc. (Tech.) Senior Scientist Head of the TAU HV laboratory	
C/Elecrical engineering, HV laboratory 1720 Tampere, Finland	
cated in the full test report TAU-01122	
oles. Partial copying of this report is not allowed.	

WEB www.tuni.fi



OY NORDIC SPA LTD Tehdaskatu 7, 24100 Salo, Finland mail@novitek.fi

