



 Nordic Council
of Ministers

A comparative study on water tap labels within the Nordsyn cooperation

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This publication is also available online in a web-accessible version at <https://pub.norden.org/temanord2021-524>.

Foreword

The study presented in this report has been performed by the Swedish Energy Agency within the Nordic cooperation Nordsyn, sponsored by the Nordic Council of Ministers. Nordsyn is a cooperation of Nordic agencies responsible for policy and market surveillance of ecodesign and energy labelling. The project team consisted of Stefan Nording, Ileana Hagelin and Helena Nilsson (tests), Peter Bennich (policy analysis) and supervised by Lovisa Blomqvist (Nordsyn project coordinator) and Johanna Whitlock (Head of Testlab). The aim of the project is to give input to the ongoing preparatory study on taps and to analyse how the function of taps is maintained. The idea is to give relatively objective facts in this report, but in case opinions are given these do not necessarily reflect the opinions of the Nordsyn members.

Information Rev 1

This report has been revised and replaces earlier report dated 2021-04-23. Renewed tests showed that one of the taps had shorter rinsing times for the four activities e-h. Therefore, the tap 3510, FM Mattsson 9000E, now has got the energy class B, Q_{sa} , 1,8 kWh.

Summary

This project was initiated by the Nordsyn group, with the aim to assess two different voluntary energy labelling schemes in Europe, in the context of ongoing development of test methods and a possible mandatory energy label for water taps within EU/EEA¹. The first label is the Unified Water Label (UWL), promoted by the European Bathroom Forum (EBF, representing manufacturers of water taps, shower heads etc. in Europe), and the second one is the Swedish Energy label (or Swedish Standard, SS) for water taps, developed by the Swedish Technical Committee TK519 (consisting of Swedish manufacturers and the Swedish Energy Agency).

Whereas the UWL is based on water flow only, the SS is based on both water flow and rinsing performance. The goal with the study has been to understand pros and cons of the two labels in general, and with a focus on whether the two labels can serve as a basis or inspiration for a possible mandatory energy label in the EU.

The water taps were selected from the Nordic market in agreement among the member states in the Nordsyn group, using available information on performance (such as UWL and/or Swedish labels). The ambition was to get a spread in performance, to allow for a better analysis.

When comparing the Swedish energy label and the Unified Water Label, we found that the Swedish label is better in differentiating between taps, due to the inclusion of rinsing performance. Furthermore, the results show that there is no direct correlation between water flow and rinsing performance; hence, some of the low flow taps premiered in the UWL labeling scheme turn out to be less energy efficient in the Swedish labelling scheme than taps with a higher water flow.

A closer look of the water use indicate that the Swedish label seems to promote also *water* efficiency in a better way. However, this result should be treated with some care, but calls for further exploration in the upcoming standardization work in CEN 164/WG8.

1. European Economic Area (EEA) links the EU member states and three EFTA states (Iceland, Liechtenstein, and Norway) into an internal market governed by the same basic rules

Background

Water taps is one of the energy-related products listed in the ecodesign (and energy labelling) working plan². The reason is the large expected savings of both energy and water use, according to the preparatory study final report³ published in 2014 and referenced in the Com notes to the Consultation Forum 18th December 2019: *Up to 70 TWh per year (and 1900 Mm3 of abstracted water) in 2025; up to 17 TWh per year (and 700 Mm3 of abstracted water) in 2030 – in the same order of magnitude as eco-design measures on televisions*⁴.

Hence, since 2011 the European Commission (DG Environment and DG Energy) has considered a mandatory energy label to be used across Europe. However, there already exist several voluntary labels for water taps in European countries, including Sweden, Switzerland and UK. These labels focus on different properties (flow, functionality and energy use) and are based on different test methods. It could have been anticipated that one or more labels would suit as a basis for a common EU label, but the preparatory study from 2014 and a follow-up study⁵ from 2019 made a review and concluded that no one of the existing labels would work, for various reasons.

Moreover, the "European Bathroom Forum" (EBF, an organisation of European manufacturers of water taps, shower heads etc), has been developing an alternative label, the so-called "Unified Water Label" (UWL), based on some of the existing voluntary labels. The idea was to pave the way for a common although still voluntary label in Europe, meeting the criteria set out by the alternative policy instrument "Voluntary Agreements" (VA), a type of self-regulation in ecodesign. Hence, the Commission could either continue to develop a mandatory energy label, fulfilling all the criteria set out in the energy labelling framework regulation 2017/1369, or accept a Voluntary Agreement, fulfilling all the criteria set out in the ecodesign framework directive 2009/125/EC⁶.

However, in the past years, it has been clear that neither path is without problems:

1. Existing mandatory energy labels (for other products) are based on functionality and performance, i.e. energy use normalised over a typical function or service. This requires clear definitions and test methods. For water taps etc, the Swedish Energy label is the only clear case where this is achieved; however, the definitions and the test method are national and not recognised as a European standard.
2. Other energy labels, including the UWL, are typically based solely on water flow. Accepted test methods are available which makes this an attractive choice. On the other hand, this does not capture performance or relates water flow to energy use in a clear manner and hence does not meet the basic conditions for a mandatory energy label⁷.
3. The proposed alternative of a Voluntary agreement (VA) has an additional

2. As expressed in the previous plan 2012–2014 and the latest plan for 2016–2019: [com_2016_773.en_.pdf \(europa.eu\)](#) p 5 (Water related products)

3. [MEErP Preparatory Study on Taps and Showers. Final report EU Science Hub \(europa.eu\)](#)

4. From "CF discussion note taps and showers rev2" presented at the Consultation Forum 18 Dec 2019.

5. Follow-up of the MEErP Preparatory Study on Taps and Showers Final Report, JRC, May 2019, found on [Product groups documents Product Bureau \(europa.eu\)](#)

6. Later explained more in detail in the Commission Recommendation (EU) 2016/2015 on guidelines for self-regulation measures concluded by industry

7. Attempts have been made to convert annual water use to energy use based on assumptions on annual water use and relative share of cold and hot water; however, apart from being crude assumptions, this is still disregarding the fundamental question of performance.

problem: a VA is defined and described as an alternative to mandatory *ecodesign* requirements, and not to mandatory energy labels. Furthermore, another criterion is that the market share of products covered by a VA must exceed 80%; as of late 2019 the share was only about 60% i.e. far from the limit. Thus, for these reasons it has been questioned whether a VA is a legal alternative at all.

As a culmination of the discussions of these problems, it became clear at the Consultation Forum (CF) of *ecodesign* and energylabelling of the 18th December 2019 that member states do not support further work on a VA based on the UWL due to the above flaws. Instead, it was recommended to continue to work on a mandatory energy label with a proper inclusion of performance. Furthermore, the Commission proposal to issue a standardisation mandate was supported, in particular since this would give an opportunity to include definitions and test method(s) for performance.

Thus, after due process, a standardisation mandate⁸ was issued in December 2020. The mandate was accepted by the CEN164/WG8, and the work will start in the beginning of 2021 and be finished no later than the 30th November 2023. The mandate covers taps and showers, and it is explicitly mentioned in preamble (15) that: *"... The standard should in particular address the need to ensure the necessary functional performance aspects such as rinsing efficiency or comfort in an accurate and reproducible way associated with water and energy efficiency of taps and showers."*

8. COM implementing decision C(2020) 8839

Aim of the project

As an input to the ongoing development of an EU-common energy label and the related standardisation work described in the previous section, this project has been performing tests according to the UWL and the Swedish label, respectively. Whereas the UWL is based on water flow only, the Swedish label is based both on water flow and rinsing performance.

One purpose was to compare the different test methods for energy consumption to each other. The project tested water taps for sale in the Nordic countries using both test methods and analysed the results.

Another purpose was to compare the performance of the different water taps based on the two test methods.

Objects tested

On behalf of Nordsyn, the Swedish Energy Agency (Testlab) purchased 15 mechanical mixing valves (sink taps and basin tap⁹) from different retailers across Europe. The selection was made with acceptance from the Nordsyn group.

The mixing valves were selected among listed labeled products on the EBF website¹⁰. The challenge was to find labeled products that are available on the Nordic market and to find retailers that sell the actual products. The selected list of products had to be changed due to low availability.

Table 1. Table with tested objects¹¹

Brand	Ideal Standard (3508)	KWC (3393)	La Torre (3382)	Laufen (3505)	Roca (3397)
Model	Tesi	Vita	Metro 32001 CS	Val	Victoria
RSK number / EAN number	Type A6575AA 4015413338394	-/ 7612 158 4515 85	-/-	3113810041211 / 7612742514436	A5A3025C00 / 8 414329 768091
Place of purchase	Sonono, Germany	Megabad, Germany	Ebath, Italy	Sonono, Germany	Amazon Data Services Sweden AB (366519)
Internet address	sonono.de	megabad.com	ebath.store/en/	sonono.de	amazon.com
Type of mixing valve	Basin	Basin	Basin	Basin	Basin
Date of purchase	2020-04-23	2019-11-26	2019-11-14	2020-04-23	2020-01-20

Brand	Duravit (3392)	Duravit (3507)	FM Mattsson (3509)	Hans Grohe (3391)	Hansgrohe (3506)
Model	B.3 Basin Mixer	Kiwa B2	9000E II	Axor Citterio	Metris VVTM
RSK number / EAN number	- / B3 1 03 0001 0 10	B2 1010002010 / 7612158494292	0001134061/20064 / 7391887232718	39032000 / 4011 0976 48927	31084000 / 4011097661001
Place of purchase	Megabad, Germany	Sonono, Germany	Bauhaus & Co KB	ByggHemma, Sweden	Sonono, Germany
Internet address	duravit.se	megabad.com	ebath.store/en/	sonono.de	amazon.com
Type of mixing valve	Basin	Basin	Basin	Basin	Basin
Data of purchase	2019-11-26	2020-04-23	2020-04-23	2019-11-21	2020-04-23

9. Sink taps are taps intended for kitchen and basin taps are intended for bathrooms.

10. <http://www.europeanwaterlabel.eu/findaproduct.asp?country=GB&category=4&rating=&manufacturer=&order=>

11. Pictures and more information of test samples can be found in Calculating templates. See attachments.

Brand	Bristan (3252)	Cornat (3394)	FM Mattsson (3510)	Roca (3250)	Strand (3529)
Model	Easyfit sink mixer AMR EFSNK C TO	Rieti, RIES	9000E	Targa A5A8360C00	Solid SO-1001K
RSK number / EAN number	-/504868044163	L472/ 526781TVO_AE212 /4035300636624	000115732/19352 / 7319048000013	-/-	AW20170515023 / 7350025861302
Place of purchase	eBay	Ideal Corralejo, Spain	Bauhaus & Co KB	Amazon (Europe)	ByggHemma, Sweden
Internet address	ebay.com	idealbricolaje.com	bauhaus.se	amazon.com	bygghemma.se
Type of mixing valve	Sink	Sink	Sink	Sink	Sink
Date of purchase	2019-02-25	2020-01-08	2020-04-23	2019-02-25	2020-06-08

Test methods

The following methods were used:

- SS 820000:2020 Sanitary tapware - Method for determining the energy efficiency of mechanical basins and sink mixing valves – Single lever mixer
- Two deviations have been done. Blue colouring, applicable to food colouring, has been used instead of red food colouring. The rinsing time for activity e-h has been filmed and evaluated after the tests has been ended instead of using a chronometer to record the time.
- SS-EN 817:2008 Sanitary tapware - Mechanical mixing valves (PN 10) – General technical specifications

These methods are not within Testlab accreditation.

All the mixing valves were tested according to the two test methods mentioned above.

The test of mixing valves was performed with aerators supplied by the manufacturer, except for the products listed below, where a hydraulic resistance was used to perform the flow test according to SS-EN 817:2008.

- La Torre Metro 32001 (3382)
- Roca Victoria (3397)
- FM Mattsson 9000E (3510)
- Cornat Rieti RIES (3394)

Energy classification – SS 820000:2020

See table 2 below. The energy consumption for eight defined activities (labelled [a – h] in table 2) in SS 820000:2020, are determined by measuring the flow rate, the temperature of the mixed water and the time, for the activity to evaluate rinsing performance.

Applied supply pressure are typical for the Nordic countries and is also available within Europe.

The calculation of the total energy usage (Q_{sa}) of the mixing valve according to SS820000:2020 is made by calculating the energy usage per activity (Q_a) and thereafter summarising all the eight activities.

$$Q_a = q_{m,saxtaxcp} \times (T_{sa} - T_{cw3600}) \text{ kWh}$$

$$Q_{sa} = \sum t = a_d Q_{a,j} + 3 \times \sum j = e_h Q_{a,j} \text{ kWh}$$

According to SS 820000 the definition of *economy flow* is the flow rate that is obtained when the handle is opened in its most open position by one single operation. The handle position must also be retained when the user releases the handle. A corresponding definition applies to the *economy temperature*. For activities where *economy flow* or *economy temperature* is specified and the mixing valve lacks these features, the maximum flow and the maximum temperature have been used instead.

Table 2. Presentation of the activities in test method SS 820000:2020.

Activity	Supply pressure (kPa)	Water outlet temperature (°C)	Flow rate (l/min)	Time of activity (s)	Handle position /type of rinsing
a	300 ± 20	economy	economy	60	-
b	700 ± 20	economy	economy	60	-
c	300 ± 20	-	economy	60	Between center position and full hot position
d	300 ± 20	-	economy	60	Center position
e	300 ± 20	38 ± 1	economy	-	Food coloring
f	300 ± 20	38 ± 1	basin: 3±0,1 sink: 5±0,1	-	
g	300 ± 20	50 ± 1	economy	-	Food coloring and peanut oil
h	300 ± 20	50 ± 1	basin: 3±0,1 sink: 5±0,1	-	

Based on Q_{sa} , the energy classes are defined as shown in *Figure 1* below. Note that the time to pour 4 liters of water at a standard pressure of 300 kPa is also indicated on the label.

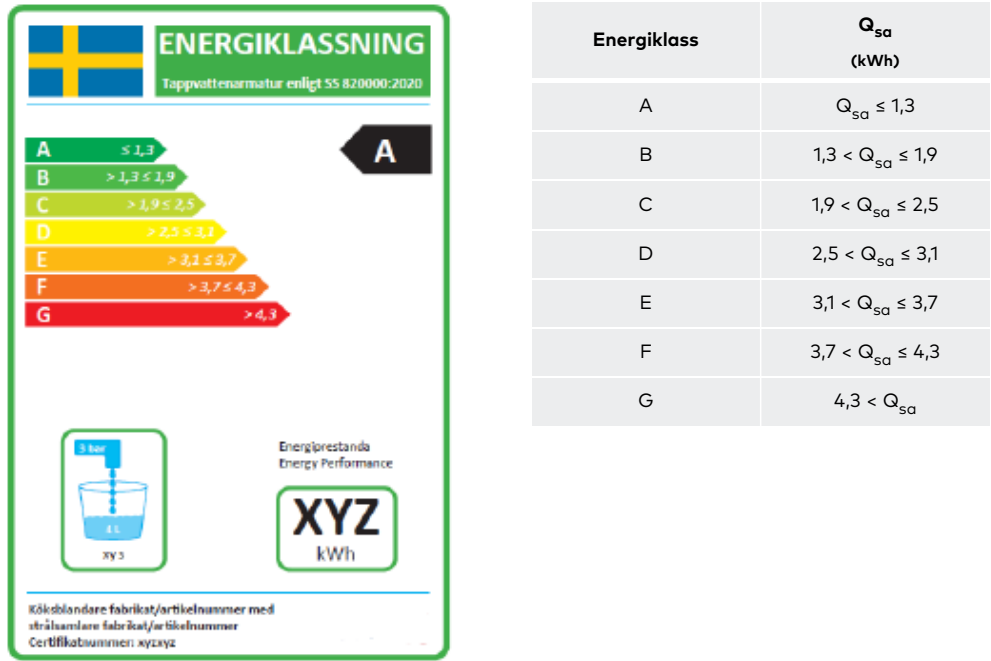


Figure 1. Energy classification according to SS 820000:2020.

Energy classification UWL (Unified Water Label)

This label does not consider any performance but concentrates on the maximum water flow of the product.

The flow rate is measured according to test method SS-EN 817:2008 [pt. 10.6]. When labeled according to the scheme the combined flow is calculated from both the hot and cold inlet. A tap with a low flow is classified in the upper part of the classes.

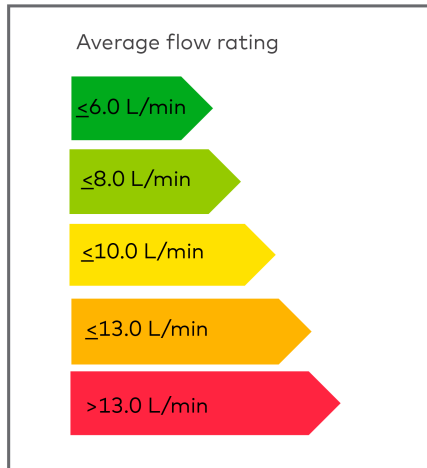


Figure 2. Unified Water Label Classification.

The measurements are made by setting the mixer lever to different settings which is controlled by measuring the mixed water temperatures on the outlet:

- Full cold position,
- 34 °C,
- 38 °C,
- 44 °C and
- Full hot position.

At a pressure of 300 ± 20 kPa, the temperature is measured on the water outlet on the mixer.

For all activities applies that the specified temperatures of supplied cold and hot water are 10 ± 1 °C and 60 ± 1 °C respectively and the flow on both cold and warm inlet is measured.

The measured combined flow on both cold and warm water is then calculated on each and one of the outlet temperatures mentioned above. The maximum measured flow is then compared to the product label.

Table with the results

Energy class according to SS 820000

In Table 3 the measured rinsing time is displayed for each activity (Activity e-h). The rinsing time measurement is repeated 10 times and the average time is calculated according to SS820000:2020 pt. 5.3.4. If the calculated relative uncertainty exceeds 10% it must be run again from the beginning of the calculated activity.

Table 3. Calculated Energy (Q_{sa}) and rinsing time per activity according to SS 820000.

Product	Brand and model	Energy class (calculated)	Energy total, Q_{sa} (kWh)	Rinsing time, colour Activity (s)		Rinsing time, colour+fat Activity (s)	
				e	f	g	h
3505	Laufen Val	A	1,1	19,9	23,0	14,6	14,4
3506	Hansgrohe Metris VVTM	B	1,4	20,9	31,5	16,4	15,8
3393	KWC Vita	A	1,0	10,3	15,4	7,4	9,9
3391	Hansgrohe Axor Cittero	A	1,2	13,9	17,5	10,3	11,1
3507	Duravit Kiwa B.2	B	1,3	17,4	20,1	11,9	16,5
3392	Duravit B3	B	1,4	14,9	20,0	9,5	13,5
3508	Tesi Ideal Standard	B	1,5	25,0	37,1	18,5	18,3
3509	FM Mattsson 9000E II	B	1,8	26,1	30,5	15,5	26,4
3529	Strand Solid-1001K	B	1,7	27,8	24,6	24,9	16,5
3250	Roca Targa A5A8360C00	B	1,7	11,4	12,6	8,3	8,6
3510	FM Mattsson 9000E	B	1,8	15,0	18,0	12,3	15,9
3382	La Torre Metro	B	1,8	10,8	19,6	8,3	17,4
3397	Roca Victoria	C	2,0	7,4	18,6	6,3	13,3
3394	Cornat Rieti RIES	A	1,0	13,4	12,0	9,4	9,1
3252	Bristan Easyfit AMR	E*	3,2	6,3	10,1	4,0	6,0

*The tap 3252, with energy class E was difficult to measure due to the high loss of pressure drop. This could clearly be noted when tested in activity "b" (SS 820000:2020) where the dynamic water pressure is 700 kPa. The required pressure could not be maintained and therefore the estimation of the calculated (Q_{sa}) is assumed based on what could be measured.

The calculated Energy (Q_{sa}) of all taps are displayed in *Figure 3* (basin mixers) and *Figure 4* (sink mixers) as a function of measured flow according to SS 820000.

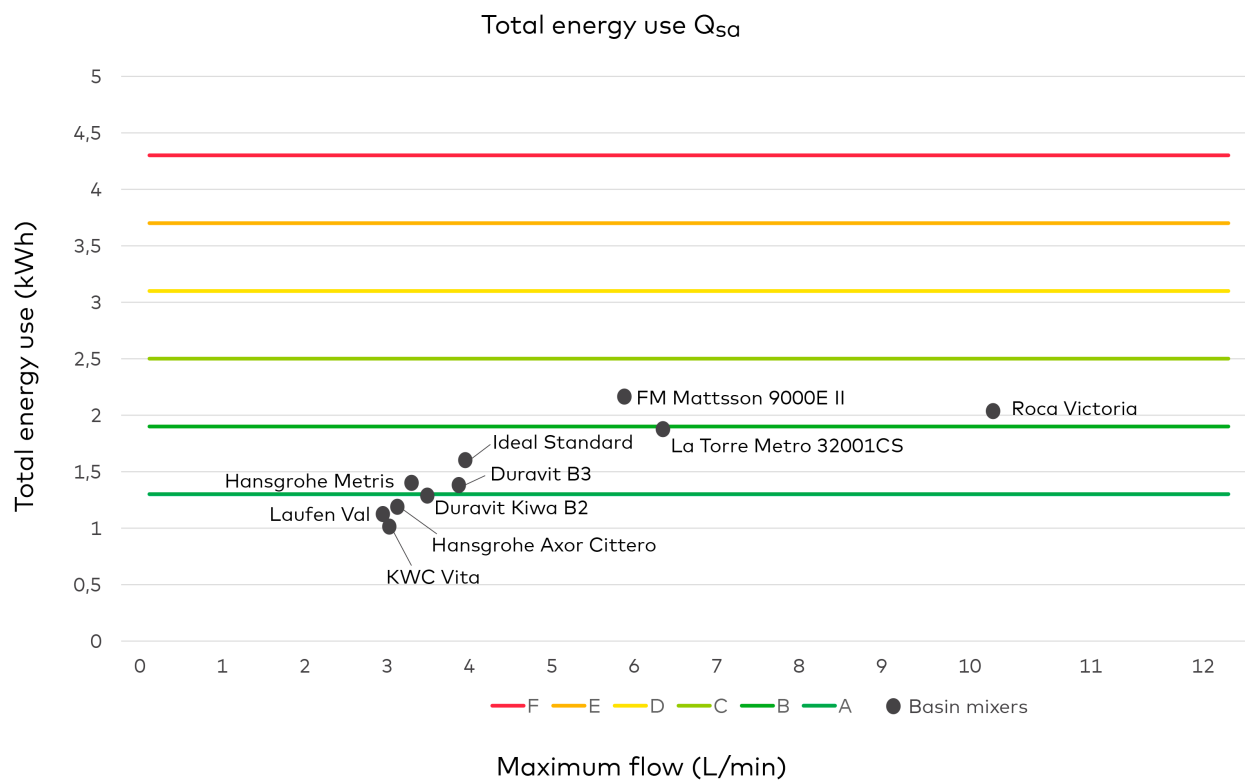


Figure 3. Calculated energy use Q_{sa} related to classification according to SS 820000:2020 (Basin mixers)

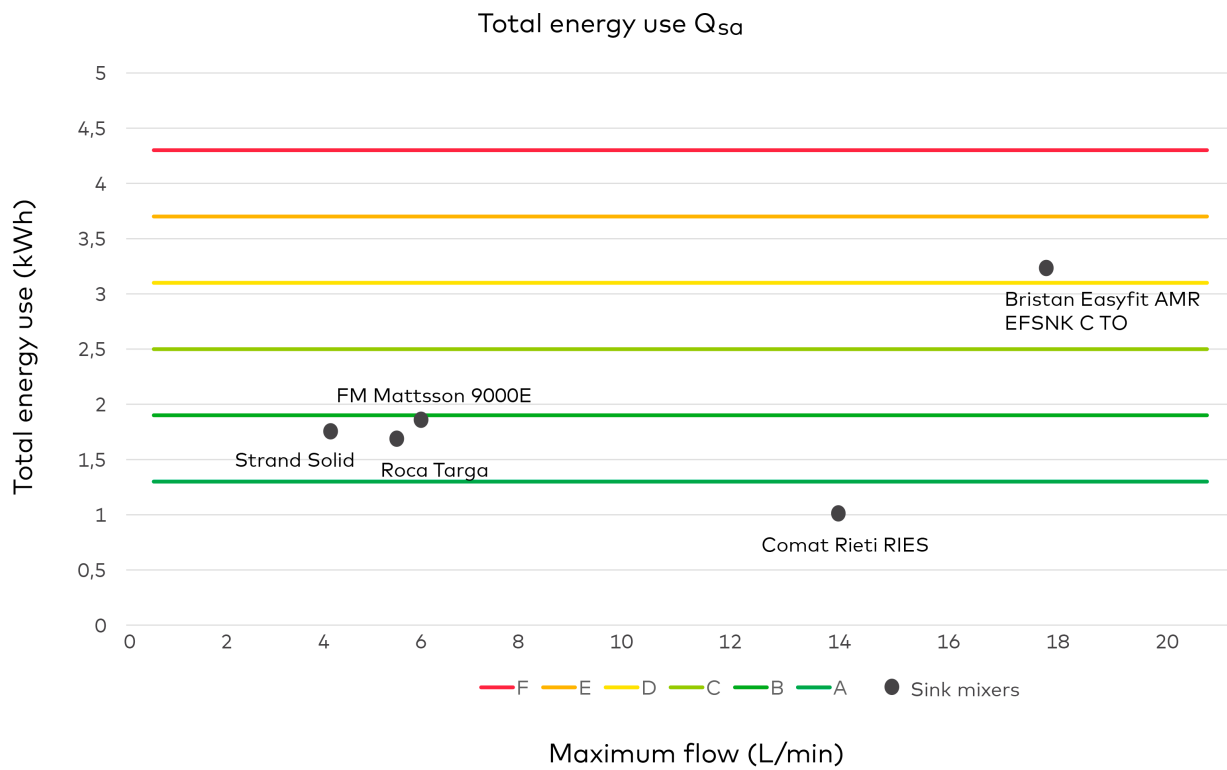


Figure 4. Calculated energy use Q_{sa} related to classification according to SS 820000:2020 (Sink mixers)

Calculated Energy usage according to UWL

The calculated Energy usage is taken from downloaded Excel spreadsheets from the European Bathroom Forum website¹². The highest measured flow is transmitted to the Excel spreadsheet when calculating the Energy usage (*Table 4*).

Table 4. Minimum and maximum flow rate according to SS-EN 817. Information regarding declared flow is collected from the European Bathroom Forums website (<http://www.europeanwaterlabel.eu>). The calculated Energy usage is taken from downloaded Excel spreadsheets from the European Bathroom Forum website¹³. The taps are presented in the same order as in *Table 3*.

Product	Brand and model	Measured flow (l/min)		Cold start	Declared flow (l/min)	Calculated Energy usage (kWh)
		Min	Max			
3505	Laufen Val	4,1	4,2	Yes	5,7	181
3506	Hansgrohe Metris VVTM	4,3	4,6	No	5,7	220
3393	KWC Vita	4,0	4,6	No	6,0	222
3391	Hansgrohe Axor Cittero	4,1	4,7	No	5,7	223
3507	Duravit Kiwa B2	4,4	4,7	No	5,3	225
3392	Duravit B3	3,4	5,0	No	5,3	239
3508	Ideal Standard Tesi	4,7	5,2	No	5,0	247
3509	FM Mattsson 9000E II	5,3	5,9	Yes	--	256
3529	Strand Solid-1001K	4,5	6,1	Yes	--	343
3250	Roca Targa A5A8360C00	6,1	6,7	No	--	418
3510	FM Mattsson 9000E	6,1	7,1	Yes	--	400
3382	La Torre Metro 32001	6,4	7,4	No	9,0	354
3397	Roca Victoria	9,8	11,6	No	12,6	556
3394	Cornat Rieti RIES	10,7	15,1	Yes	--	848
3252	Bristan Easyfit AMR	13,4	19,8	No	19,8	1236

12. <http://www.europeanwaterlabel.eu/energycalculation.asp>

13. Taps equipped with a cold start receives a 10% bonus in the UWL calculation of Energy usage.

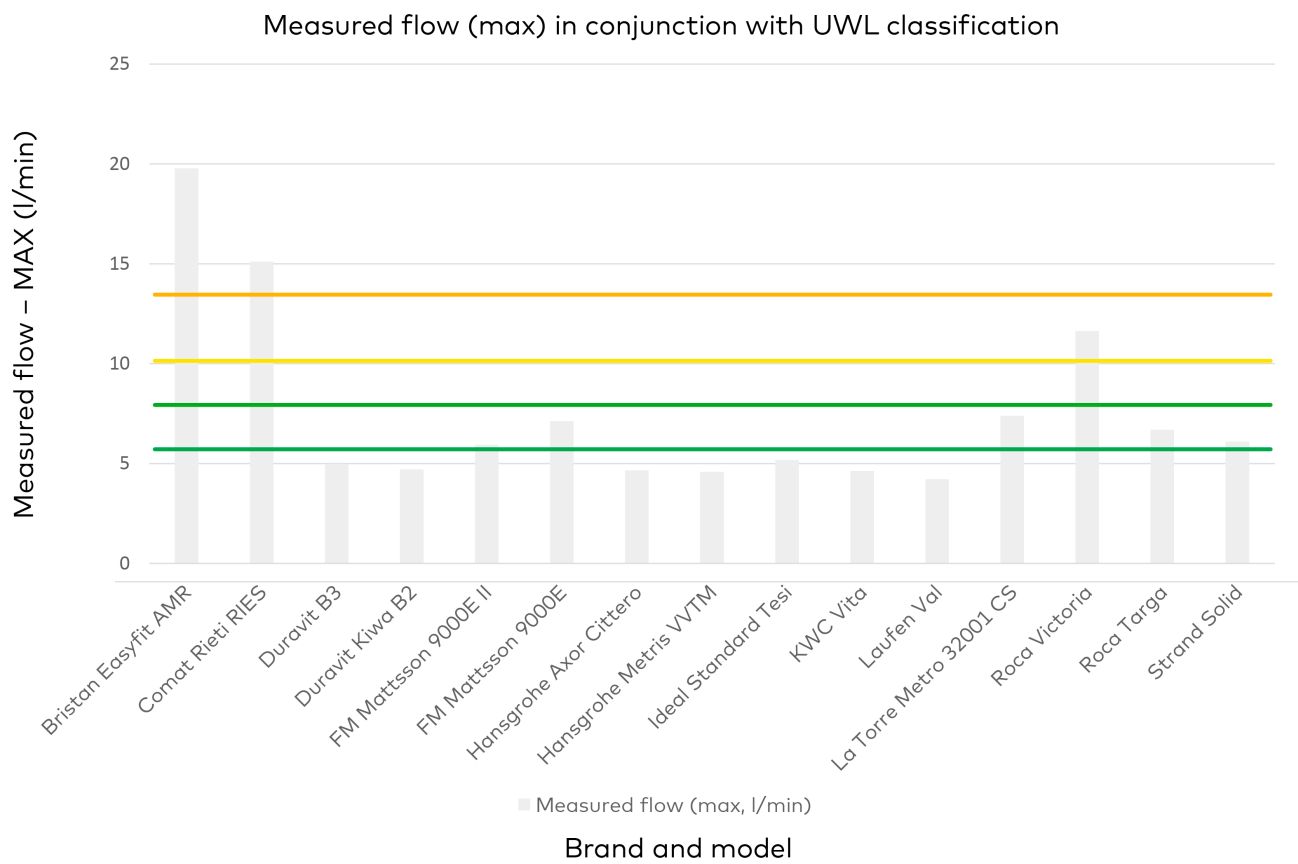


Figure 5. Measured flow according to SS-EN 817 where the maximum flow is converted to the classification according to Unified Water Label. A tap with a flow larger than 13 l/min will get a red label.

Discussion

Comparison of the energy label between the two methods

A comparison between the two label schemes is made in *Table 5*. The labels are not directly comparable as they are based on different parameters.

Table 5. Comparison of labels and classification on the tested taps. Note that the total energy Q_{sa} is calculated according to the weighted sum in eq [2] above. The taps are presented with increasing water flow according to UWL and the corresponding results according to SS are shown to the right.

Product	Brand and model	Energy class			Energy (kWh) [SS820000:2020]	
		UWL (l/min)	SS820000:2020	Σ Activity(a-d)	Σ Activity(e-h)	Qsa
3505	Laufen Val	4,2	A	0,61	0,16	1,1
3506	Hansgrohe Metris VVTM	4,6	B	0,81	0,18	1,4
3393	KWC Vita	4,6	A	0,75	0,09	1,0
3391	Hansgrohe Axor Cittero	4,7	A	0,81	0,12	1,2
3507	Duravit Kiwa B2	4,7	B	0,86	0,15	1,3
3392	Duravit B3	5	B	0,95	0,14	1,4
3508	Tesi Ideal Standard	5,2	B	0,93	0,21	1,5
3509	FM Mattsson 9000E II	5,9	B	1,01	0,26	1,8
3529	Strand Solid-1001K	6,1	B	0,87	0,28	1,7
3250	Roca Targa A5A8360C00	6,7	B	1,25	0,14	1,7
3510	FM Mattsson 9000E	7,1	B	1,14	0,23	1,8
3382	La Torre Metro 32001	7,4	B	1,39	0,14	1,8
3397	Roca Victoria	11,6	C	1,45	0,18	2,0
3394	Cornat Rieti RIES	15,1	A	0,62	0,12	1,0
3252	Bristan Easyfit AMR	19,8	E	2,79	0,14	3,2

Energy and water use

Five of the taps tested are sink mixers and ten are basin mixers. The spread of the measured energy classes (SS 820000:2020) are:

- Four taps with energy class A
- Nine taps with energy class B
- One tap with energy class C
- One tap with energy class E

Five of the measured taps are equipped with a cold start, which can be seen in figure 9 and figure 17 (in Appendix 18) where the energy is close to zero.

The aim of the project was to see if there is a convergence or divergence when testing and comparing the labels. That is, if they are closely aligned, it could be argued that a water-flow-only based label is sufficient, and a scheme including also rinsing performance add no extra value.

In this study, the number of taps is limited to 15. Despite this, we find differences between the two schemes, as seen in *Table 5*. For example, the UWL have eight taps in the top class, i.e. with a water flow less than 6 l/min. The corresponding labels in the Swedish system are three in class A and five in class B.

Furthermore, when examining the relation between water flow and energy class more closely, such as in *Table 6*, it can be seen that the tap with a *higher* flow (tap "3391" with 4.66 l/min) gets an A, whereas the tap with *lower* flow (tap "3506" with 4.59 l/min) gets a B.

Table 6. Difference on tested taps and the spread of the label schemes.

	UWL (l/min)	SS 820000:2020
3391	4,66	A / 1,17 kWh
3506	4,59	B / 1,36 kWh

The conclusion of these two observations – the spread in class A and B, and the impact of good rinsing performance – is that the Swedish label is better in differentiating between taps than the UWL label.

The sink tap from Cornat Rieti (object 3394) performs well in the Swedish label. One reason is that it is designed with cold start. This is well expressed in *Figure 4* where the labels can be examined together where the measured maximum flow of the taps is on the X-axis and the label according to the Swedish System is on the Y-axis. The taps perform well on the rinsing by having a low energy consumption in all eight activities. A tap with a high flow and good rinsing performance is of interest when filling up cookware and when rinsing the cutlery and plates in everyday life.

The scope of the UWL is more comprehensive as it is intended for both high-pressure respectively low-pressure system. Low pressure systems are common in UK and southern part of Europe where the building is equipped with a plumbing system

where the water pressure is created by the gravity of the mass of water in the water tank on the roof.

A deeper look at the water use

The Unified Water Label is based on the water flow, even though the annual energy use is calculated assuming a standard total use of water. The Swedish label, on the other hand, is focused on the energy use, reflected in the series of activities designed to estimate the rinsing performance for two different tasks while varying the temperature and the flow rate. Hence, the Swedish label does not highlight the water use in particular.

Despite this, it is possible to make an analysis of the water use based on the Swedish standard as well. *Table 7* presents the total amount of water used in the series of activities, grouped as before in the activities a-d (fixed time and pressure) and e-h (rinsing performance). The difference as compared to the energy calculation is that no weighting factor is used for the latter, and hence no sum of the two groups are presented. Instead, the water use of the two groups are compared and analyzed separately.

Table 7. The spread and difference between labels and water consumption (see text).

Product	Brand and model	Label	Water (volume) [l]		Label
		UWL (l/min)	Σ Act(a-d)	Σ Act(e-h)	SS 820000
3505	Laufen Val	4,2	16,5	4,1	A
3506	Hansgrohe Metris VVTM	4,6	17,2	4,9	B
3393	KWC Vita	4,6	16,4	2,5	A
3391	Hansgrohe Axor Cittero	4,7	17,3	3,2	A
3507	Duravit Kiwa B2	4,7	17,9	4	B
3392	Duravit B3	5	19,2	3,6	B
3508	Tesi Ideal Standard	5,2	18,8	5,6	B
3509	FM Mattsson 9000E II	5,9	24,8	6,8	B
3529	Strand Solid-1001K	6,1	22	7,4	B
3250	Roca Targa A5A8360C00	6,7	26	3,7	B
3510	FM Mattsson 9000E	7,1	29	5,9	B
3382	La Torre Metro 32001	7,4	30,1	3,7	B
3397	Roca Victoria	11,6	31,9	4,9	C
3394	Cornat Rieti RIES	15,1	17,3	3,3	A
3252	Bristan Easyfit AMR	19,8	64,9	3,8	E

The first group of activities, a-d, is directly related to the flow rate since the water volume is measured after a given time (60 s) and at a specified pressure (300 or 700 kPa). Hence, the general trend is that the higher the flow rate, the larger the volume.

For the second group of activities, e-h, the results are completely different. As can be seen, there is no obvious relation between flow rate and rinsing performance. For example, the tap 3394 (flow rate 15.1 l/min) use in total 3.3 litre and is basically as good as the tap 3391 (flow rate 4.7 l/min) that uses 3.2 litre; on the contrary, the tap 3510 (flow rate 7.1 l/min) uses as much as 5.9 litre.

At the same time, the use of water follows the Swedish energy label more closely; the taps 3394 and 3391 are both class A taps, whereas the tap 3510 is of class B.

From this we conclude that it might be argued that the Swedish energy label favours not only energy efficiency, but water efficiency as well. However, this conclusion should be treated with some care, since the design of the Swedish label did not have water efficiency in focus. It remains for the upcoming standardisation work in CEN164/WG 8 to explore this further.

Conclusions

This project has successfully compared the two different test methods and clarify how the labels relate to each other.

The Unified Water Label is based on the water flow, even though the annual energy use is calculated assuming a standard total use of water. The Swedish label, on the other hand, is focused on the energy efficiency, but preliminary results show that it favors water efficiency as well.

When comparing the Swedish energy label and the Unified Water Label, we found that the Swedish label is better in differentiating between taps, due to the inclusion of rinsing performance. Furthermore, the results show that there is no direct correlation between water flow and rinsing performance; hence, some of the low flow taps premiered in the UWL labeling scheme turn out to be less energy efficient in the Swedish labeling scheme than taps with a higher water flow.

However, if water use should be included in the Swedish label, the standard needs a revision to strike the right balance between energy and water use.

This project did not test low pressure taps as the Swedish label does not cover this type of product in the scope. In case of use for EU low pressure taps could be adopted in the scope of the Swedish label so that low pressure taps are included in the label. One advantage of the UWL is that it also includes low pressure systems, which the Swedish label does not.

A tap which guides the user to use less water is a key element for an efficient tap and adding a good rinsing performance is a good way forward. A guidance to the user can be done in different ways:

- Cold start. *The mixer lever in its starting position is mainly giving cold water.*
- Return spring. Designed with different purposes.
 - *When the user wants a higher flow. The lever is influenced by the user with an extra handgrip. When the lever is released the flow of water returns to a lower flow (economy flow).*
 - *When the user wants a higher water temperature. The lever is influenced by the user with an extra handgrip. When the lever is released the temperature of water returns to a lower water temperature (economy temperature).*
- Button. *When the user wants a higher flow. The user activates a small button with an extra handgrip. The lever can then be adjusted to a higher flow and stays there when the handgrip is released.*
- Sensor. *The tap is activated when sensing a hand in the near area of the tap. The time and temperature can be set as it is activated for a predetermined time and temperature.*

Another important technical functionality is the design of the aerator. The aerator is important to create the right formation of droplets with a specific amount of air that is mixed in the water beam. The same functionality can be created effectively with less use of hot and cold water without limiting the function (for example rinsing performance).

The Unified Water Label has many brands and models in their labelling scheme. On

the EBF website the visitor can search and filter for one or more criteria. It was hard to find models from the EBF website that were available in one or more of the Nordic countries. One of the basic ideas of the project was to detect products that are available in the Nordic region. The scope of the work to purchase taps, which originally was to buy them from Nordic internet retailers, quickly broadened to find retailers within the European region.

To conclude, this study presents interesting results which can be useful in the ongoing policy and standardization work in order to develop an effective label and a European testing method for taps.

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Stefan Nording and Peter Bennich

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The Nordic Council of Ministers
Nordens Hus
Ved Stranden 18
DK-1061 Copenhagen
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