



# Study on consumer understanding of draft energy labels for household washing machines, household washer-dryers and household dishwashers

*Final report*

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# **Study on consumer understanding of draft energy labels for household washing machines, household washer-dryers and household dishwashers**

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## 1. Introduction

The EU energy label, as provided for by Regulation (EU) 2017/1369, repealing Directive 2010/30/EU, aims at promoting the uptake of more efficient energy-related products. It aims to help consumers make informed choices by facilitating product comparisons among different models with different characteristics such as energy consumption during product use. The label focuses on the energy efficiency of the product, but also allows the inclusion of other environmental aspects (such as water consumption or noise level) relevant to consumers to make an informed choice.

Previous studies, conducted to support the review of Directive 2010/30/EU, resulted amongst others, in recognition that consumer understanding studies should, where appropriate, be conducted before a new or revised energy label is proposed by the Commission. This is reflected in Regulation (EU) 2017/1369 that states that where appropriate, when preparing delegated acts, the Commission shall test the design and content of the labels for specific product groups with representative groups of Union customers to ensure their clear understanding of the labels.

The aim of this study is to inform the Commission on the impact of possible different icons and layouts of the revised energy labels for household washing machines, household washer-dryers and household dishwashers on consumer understanding and choices. As a starting point, the Commission proposed a new label layout with several icons representing specific product features.

- Most of the proposed features are also represented on the current energy labels, namely the **energy consumption**, **water consumption**, **rated capacity** (in terms of the number of place settings for dishwashers and in terms of maximum load – in kilos of dry cotton clothes – for washing machines and combined washer-dryers) and **noise level**. However, while the labels currently provide an indication of the energy and water consumption per annum, in the Commission's proposal energy and water consumption are indicated per cycle, and are accompanied by an **indication of the tested programme**.
- Furthermore, the proposal includes the addition of a new icon representing the **duration of the (tested) programme**.
- Finally, some icons that are displayed on the current energy labels are no longer part of the new labels as proposed by the Commission, namely the icons indicating the **spin drying and drying efficiency** for washing machines and dishwashers, respectively.
















This study aimed to test consumer responses to the different elements of the new label designs. More specifically, the study aimed to provide insight into:

- consumer **understanding** of specific icons designed to represent the proposed product features;
- consumer **understanding** of the full label (e.g. how different elements relate to each other);

- the perceived **relevance** of the product features proposed to be represented on the proposed new labels;
- the extent to which consumers **miss** information provided in current labels that is not included in the proposed new labels;
- the impact of the labels (relative to other product information) on consumer **choice behaviour**.

For water consumption, the number of place settings (for dishwashers), maximum load (for washing machines and washer-dryers), programme duration, and noise level, three icon alternatives were developed and tested (see Table 1.1).

**Table 1.1. Icon alternatives**

Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 <b>39L</b>	 <b>39L</b>	 <b>39L</b>
Number of place settings (dishwashers)	 <b>12X</b>	 <b>12X</b>	 <b>12X</b>
Maximum load (washing machines/washer-dryers)	 <b>8kg</b>	 <b>8kg</b>	 <b>8kg</b>
Programme duration	 <b>4:00</b>	 <b>4:00</b>	 <b>4:00</b>
Noise level	 <b>72dB</b>	 <b>72dB</b>	 <b>72dB</b>

The icons were combined into full energy labels (see Table 1.2-1.4). For washer-dryers, the label provides all information both for the complete wash and dry cycle as well as for the wash cycle only (see Table 1.4). Furthermore, the labels include an indication of the tested programme (e.g. the 'ECO' programme for dishwashers, see Table 1.2). The position of this information varies across the label alternatives. Since it is not yet clear which name can best be used for the tested washing programme for washing machines and washer-dryers, two different names were tested ('ECO 40-60'

and '40-60', see alternatives 3A and 3B in Tables 1.3 and 1.4). For each product group, the name of the tested programme is displayed either with (alternative 3) or without a visual representation of a cycle (alternatives 1 and 2). In the latter case, numbers are provided with the indication "/cycle" whenever relevant.

**Table 1.2. Label alternatives: dishwashers**

Label alternative 1	Label alternative 2	Label alternative 3

**Table 1.3. Label alternatives: washing machines**

Label alternative 1	Label alternative 2	Label alternative 3A	Label alternative 3B



**Table 1.4. Label alternatives: washer-dryers**

Label alternative 1	Label alternative 2	Label alternative 3A	Label alternative 3B

All labels were developed in one of the potential new house style designs that were developed in a parallel project.<sup>1</sup>

<sup>1</sup> Study on the impact of a draft energy label on consumer understanding and purchase decisions for household refrigerating appliances. Specific contract No. ENER/C3/FV2017-438/10/FWC2015-631/02 under Framework contract No. ENER/C3/2015-631.

## 2. Methodology

To gain insight into consumer understanding of draft energy labels for household dishwashers, washing machines and washer-dryers, an online survey was administered in GfK's online panels in seven European countries. The fieldwork was conducted in July 2018. Approximately 1350 consumers per country completed the survey (9863 respondents in total), which consisted of five parts:

### *Part 1: Interpretation of the tested programme*

This first part examined consumers' interpretation of the tested programme for washing machines and washer-dryers. In this part, the tested programme was described. Respondents were asked (1) which name, according to them, would best fit the described programme (*name fit*), (2) the temperature at which they thought the laundry would be washed if they ran the described programme (*programme interpretation*), and (3) whether they would use the programme (*use intention*).

### *Part 2: Product identification and choice tasks*

In the second part of the questionnaire, respondents were either exposed to dishwashers, washing machines or washer-dryers (randomly decided). They were presented with an assortment of eight dishwashers (or washing machines, or washer-dryers) and were instructed to find product(s) with a specific feature. Half of the respondents were asked to identify product(s) with the highest level of the attribute (e.g. "the dishwasher with the best energy efficiency class") and the other half were asked to identify product(s) with the lowest level of the attribute (e.g. "the dishwasher with the worst energy efficiency class"). The products were described in terms of key product attributes and carried full energy labels (see Figure 2.1). Respondents saw only one of the label alternatives for the specific product group (randomly decided, see Table 1.2-1.4). For the features of interest (e.g. energy efficiency, energy consumption, load capacity, noise level, etc.), we measured whether respondents could accurately identify products with the highest (or lowest) level of that specific feature (**objective comprehension**). Furthermore, we asked which of the products they would choose if they were actually planning to buy a dishwasher (or washing machine, or washer-dryer) (**choice**). This task was repeated for a different product group (and different product features). This product rotation was employed to avoid strong learning effects throughout the survey. Table 2.1 shows the structure of the survey, including the product rotation.

### *Part 3: Comprehension test (isolated icons)*




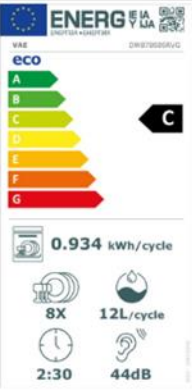

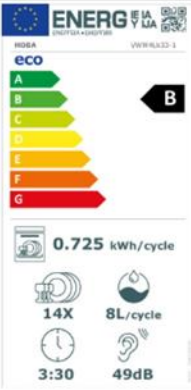





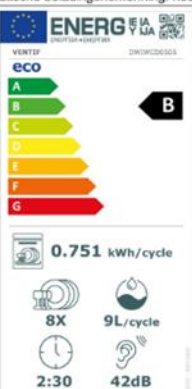

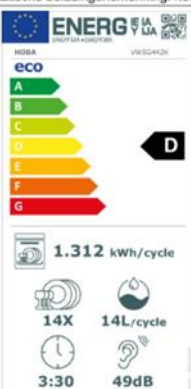

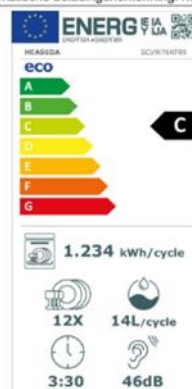
In the third part, respondents were exposed to a draft energy label for the third product group (which they had not yet been exposed to in the product identification and choice tasks, see Table 2.1). For each of the features of interest – water consumption, load capacity, programme duration, and noise level – they saw one out of three icon alternatives designed for this study (see Table 1.1 for an overview). For each feature, respondents were first asked whether they thought the icon was clear or unclear (**subjective comprehension**). Next, they were asked to identify the meaning of the icon via a multiple choice question (**objective comprehension**). Subsequently, the meaning of the icon was briefly explained to the respondent, after which the perceived clarity of the icon was assessed once more ("Now you know its meaning, do you think this symbol is clear or unclear?"). Finally, respondents were asked whether they found the information (e.g. about the water consumption) important and whether they considered it important to include the information on the energy label (**perceived relevance**).

**Figure 2.1. Product identification task: example<sup>2</sup>**

**GfK**

Which of these dishwashers uses the smallest amount of water?

*Multiple answers are possible.*

 <p><b>VAE</b> € 1092 Minimum levensduur (in jaren): 11 Aantal programma's: 10 Startuitlet: ja Automatische beladingsherkenning: ja</p> 	 <p><b>VAE</b> € 999 Minimum levensduur (in jaren): 11 Aantal programma's: 10 Startuitlet: ja Automatische beladingsherkenning: ja</p> 	 <p><b>HOBBA</b> € 496 Minimum levensduur (in jaren): 7 Aantal programma's: 5 Startuitlet: nee Automatische beladingsherkenning: nee</p> 	 <p><b>Ventif</b> € 574 Minimum levensduur (in jaren): 7 Aantal programma's: 7 Startuitlet: ja Automatische beladingsherkenning: nee</p> 
 <p><b>Heassda</b> € 949 Minimum levensduur (in jaren): 11 Aantal programma's: 5 Startuitlet: ja Automatische beladingsherkenning: nee</p> 	 <p><b>Ventif</b> € 899 Minimum levensduur (in jaren): 7 Aantal programma's: 7 Startuitlet: ja Automatische beladingsherkenning: nee</p> 	 <p><b>HOBBA</b> € 306 Minimum levensduur (in jaren): 7 Aantal programma's: 5 Startuitlet: nee Automatische beladingsherkenning: nee</p> 	 <p><b>Heassda</b> € 591 Minimum levensduur (in jaren): 11 Aantal programma's: 5 Startuitlet: ja Automatische beladingsherkenning: nee</p> 

☐ I (really) don't know

<sup>2</sup> In the actual questionnaire, all information (other than the energy label) was presented in the language of the respondent.

#### *Part 4: Comprehension test (full label)*

The fourth part tested respondents' level of understanding of aspects of the energy label other than the icons. More specifically, via a number of true/false statements, we assessed (1) respondents' interpretation of the name of the tested programme on the label (namely, 'ECO' for dishwashers, 'ECO 40-60' and '40-60' for washing machines and the wash cycle of washer-dryers, and 'wash & dry' for the complete wash and dry cycle of washer-dryers), (2) the extent to which they understood that this refers to the tested programme, and (3) the extent to which they understood that information on the label is provided per cycle (rather than e.g. per year).

#### *Part 5: Background information (for sample description, see below).*

In the last part, we assessed (1) whether the respondent had recently bought – or looked up information on – one (or more) of the product groups of interest in this study, (2) the perceived importance of the product features that are represented on the draft labels, as well as other features (e.g. purchase price, brand, design/look), (3) whether they missed information on the (draft) energy label (respondents saw the label for the product that was shown in part 3 and 4, see Table 2.1), and if so, what information they missed. Finally, we measured relevant person-related characteristics – environmental concern and product category expertise – as well as socio-demographic information (age, gender, educational level, and financial situation).

Part 2 and part 3-4 were counterbalanced between respondents: half of the respondents started with the product identification and choice tasks and the other half started with the comprehension test. Annex 1 provides the complete questionnaire.

### **2.1. Country sample**

The survey was administered in seven countries – Bulgaria, Denmark, Germany, Italy, The Netherlands, Portugal and Romania – which together cover 39.7% of the EU28-population with adequate geographical spread (see Figure 2.2).

**Figure 2.2. Country sample**



**Table 2.1. Survey structure**

Respondent group 1	Respondent group 2	Respondent group 3	Respondent group 4	Respondent group 5	Respondent group 6
NA	NA	<b>Part 1: Interpretation tested programme</b> Washing machines	<b>Part 1: Interpretation tested programme</b> Washing machines	<b>Part 1: Interpretation tested programme</b> Washer-dryers	<b>Part 1: Interpretation tested programme</b> Washer-dryers
<b>Part 2: Product identification and choice tasks</b> (sets with full labels)	<b>Part 2: Product identification and choice tasks</b> (sets with full labels)	<b>Part 2: Product identification and choice tasks</b> (sets with full labels)	<b>Part 2: Product identification and choice tasks</b> (sets with full labels)	<b>Part 2: Product identification and choice tasks</b> (sets with full labels)	<b>Part 2: Product identification and choice tasks</b> (sets with full labels)
<u>Dishwashers</u> task 1: identifying product with best/worst energy efficiency class	<u>Dishwashers</u> task 1: identifying product with largest/smallest load capacity	<u>Washing machines</u> task 1: identifying product with best/worst energy efficiency class	<u>Washing machines</u> task 1: identifying product with largest/smallest load capacity	<u>Washer-dryers</u> task 1: identifying product with best/worst energy efficiency class	<u>Washer-dryers</u> task 1: identifying product with largest/smallest load capacity
<u>Dishwashers</u> task 2: identifying product with highest/lowest energy consumption	<u>Dishwashers</u> task 2: identifying product with longest/shortest tested programme	<u>Washing machines</u> task 2: identifying product with highest/lowest energy consumption	<u>Washing machines</u> task 2: identifying product with longest/shortest tested programme	<u>Washer-dryers</u> task 2: identifying product with highest/lowest energy consumption	<u>Washer-dryers</u> task 2: identifying product with longest/shortest tested programme
<u>Dishwashers</u> task 3: identifying product with highest/lowest water consumption	<u>Dishwashers</u> task 3: identifying most/least quiet product	<u>Washing machines</u> task 3: identifying product with highest/lowest water consumption	<u>Washing machines</u> task 3: identifying most/least quiet product	<u>Washer-dryers</u> task 3: identifying product with highest/lowest water consumption	<u>Washer-dryers</u> task 3: identifying most/least quiet product
<u>Dishwashers</u> task 4: actual choice	<u>Dishwashers</u> task 4: actual choice	<u>Washing machines</u> task 4: actual choice	<u>Washing machines</u> task 4: actual choice	<u>Washer-dryers</u> task 4: actual choice	<u>Washer-dryers</u> task 4: actual choice
<u>Washer-dryers</u> task 5: identifying product with largest/smallest load capacity	<u>Washer-dryers</u> task 5: identifying product with best/worst energy efficiency class	<u>Dishwashers</u> task 5: identifying product with largest/smallest load capacity	<u>Dishwashers</u> task 5: identifying product with best/worst energy efficiency class	<u>Washing machines</u> task 5: identifying product with largest/smallest load capacity	<u>Washing machines</u> task 5: identifying product with best/worst energy efficiency class
<u>Washer-dryers</u> task 6: identifying product with longest/shortest tested programme	<u>Washer-dryers</u> task 6: identifying product with highest/lowest energy consumption	<u>Dishwashers</u> task 6: identifying product with longest/shortest tested programme	<u>Dishwashers</u> task 6: identifying product with highest/lowest energy consumption	<u>Washing machines</u> task 6: identifying product with longest/shortest tested programme	<u>Washing machines</u> task 6: identifying product with highest/lowest energy consumption
<u>Washer-dryers</u> task 7: identifying most/least quiet product	<u>Washer-dryers</u> task 7: identifying product with highest/lowest water consumption	<u>Dishwashers</u> task 7: identifying product with highest/lowest water consumption	<u>Dishwashers</u> task 7: identifying product with highest/lowest water consumption	<u>Washing machines</u> task 7: identifying most/least quiet product	<u>Washing machines</u> task 7: identifying product with highest/lowest water consumption
<u>Washer-dryers</u> task 8: actual choice	<u>Washer-dryers</u> task 8: actual choice	<u>Dishwashers</u> task 8: actual choice	<u>Dishwashers</u> task 8: actual choice	<u>Washing machines</u> task 8: actual choice	<u>Washing machines</u> task 8: actual choice
<b>Part 3: Comprehension test</b> (isolated icons)	<b>Part 3: Comprehension test</b> (isolated icons)	<b>Part 3: Comprehension test</b> (isolated icons)	<b>Part 3: Comprehension test</b> (isolated icons)	<b>Part 3: Comprehension test</b> (isolated icons)	<b>Part 3: Comprehension test</b> (isolated icons)
<u>Washing machines</u> Icon 1: water consumption	<u>Washing machines</u> Icon 1: water consumption	<u>Washer-dryers</u> Icon 1: water consumption	<u>Washer-dryers</u> Icon 1: water consumption	<u>Dishwashers</u> Icon 1: water consumption	<u>Dishwashers</u> Icon 1: water consumption
<u>Washing machines</u> Icon 2: load capacity	<u>Washing machines</u> Icon 2: load capacity	<u>Washer-dryers</u> Icon 2: load capacity	<u>Washer-dryers</u> Icon 2: load capacity	<u>Dishwashers</u> Icon 2: load capacity	<u>Dishwashers</u> Icon 2: load capacity
<u>Washing machines</u> Icon 3: programme duration	<u>Washing machines</u> Icon 3: programme duration	<u>Washer-dryers</u> Icon 3: programme duration	<u>Washer-dryers</u> Icon 3: programme duration	<u>Dishwashers</u> Icon 3: programme duration	<u>Dishwashers</u> Icon 3: programme duration
<u>Washing machines</u> Icon 4: noise level	<u>Washing machines</u> Icon 4: noise level	<u>Washer-dryers</u> Icon 4: noise level	<u>Washer-dryers</u> Icon 4: noise level	<u>Dishwashers</u> Icon 4: noise level	<u>Dishwashers</u> Icon 4: noise level
<b>Part 4: Comprehension test</b> (full label)	<b>Part 4: Comprehension test</b> (full label)	<b>Part 4: Comprehension test</b> (full label)	<b>Part 4: Comprehension test</b> (full label)	<b>Part 4: Comprehension test</b> (full label)	<b>Part 4: Comprehension test</b> (full label)
Washing machines	Washing machines	Washer-dryers	Washer-dryers	Dishwashers	Dishwashers
<b>Part 5: Background information</b>	<b>Part 5: Background information</b>	<b>Part 5: Background information</b>	<b>Part 5: Background information</b>	<b>Part 5: Background information</b>	<b>Part 5: Background information</b>

*Note* – In part 2, the display order of the product identification tasks was randomised within each product block. In part 3, the display order of the icons was randomised.

Table 2.2 shows the details per country for relevant country characteristics. The sample includes:

- three countries with a low level of **consumer concern for the environment**, two with an average level of concern and three with a high level of concern. The selection also includes two countries where there has been a big (positive) change in this figure since 2011, three where the change has been around average and two where there has been little or no change since 2011;
- two countries with a high percentage of households with **broadband internet**, three with a low broadband rate and two with an average rate;
- four countries with low **consumer empowerment** and three countries with a high level of consumer empowerment;
- three countries with a low **GDP/capita**, one country with an average GDP/capita and three countries with a high GDP/capita.

**Table 2.2.<sup>3</sup> Country sample**

Country code	Population	Region	Concern for the environment (2014)	Change in concern for the environment (2011-2014)	Broadband internet at home (2015)	Consumer empowerment	GDP per capita
	%		%	%	%	Level	Level
BG	1,5%	East	47%	28%	59%	12.5	47
DE	15,9%	West	54%	25%	88%	17.3	124
DK	1,1%	North	47%	12%	84%	17.0	125
IT	11,8%	South	59%	31%	74%	13.5	96
NL	3,3%	West	58%	18%	94%	17.3	131
PT	2,1%	South	42%	0%	69%	13.7	78
RO	4%	East	65%	34%	65%	11.1	55
EU-28	100%		55%	26%	80%	15.0	100

## 2.2. Respondent sample

In each country, approximately 1350 respondents completed the survey. Respondent samples consist of members of the general public, aged 18-70, nationally representative of each country's population with quotas on age and gender. Table 2.3 and 2.4 provide a description of the sample sizes and sample characteristics for the total sample and per country.

Respondents were incentivised as part of their membership of the GfK online panel, where they receive 'points', which can then be converted into shopping vouchers, as reward for taking part in surveys.

<sup>3</sup> Sources: Concern for the environment: Flash Eurobarometer 397, <http://ec.europa.eu/COMMFrontOffice/PublicOpinion/index.cfm/Survey/getSurveyDetail/instruments/FLASH/surveyKy/2031>; Internet access: Eurostat (2015) Households having access to the internet by type of connection (code tin00073); Consumer empowerment: Index based on [http://ec.europa.eu/consumers/consumer\\_empowerment/docs/JRC\\_report\\_consumer\\_empowerment\\_en.pdf](http://ec.europa.eu/consumers/consumer_empowerment/docs/JRC_report_consumer_empowerment_en.pdf).

**Table 2.3. Sample description: socio-demographics**

	Total	BG	DE	DK	IT	NL	PT	RO
Sample size	9863	1394	1411	1402	1441	1420	1421	1374
<u>Gender</u>								
Male	48.8%	46.3%	49.1%	47.0%	50.5%	45.9%	51.7%	51.3%
Female	51.2%	53.7%	50.9%	53.0%	49.5%	54.1%	48.3%	48.7%
<u>Age</u>								
Age: 18-24	9.6%	10.4%	6.1%	12.6%	7.1%	8.3%	10.0%	13.0%
Age: 25-34	19.3%	22.0%	22.2%	15.8%	19.4%	16.3%	20.0%	19.1%
Age: 35-44	22.0%	27.8%	12.4%	15.9%	26.8%	18.0%	27.7%	25.0%
Age: 45-54	21.6%	17.3%	29.6%	24.0%	17.9%	24.4%	18.3%	19.6%
Age: 55-70	27.6%	22.5%	29.8%	31.7%	28.8%	32.9%	24.0%	23.3%
<u>Education</u>								
Elementary school or less	3.4%	1.1%	0.2%	13.9%	6.4%	1.1%	1.0%	0.4%
Some high school	6.0%	1.7%	12.9%	7.5%	5.8%	8.3%	4.7%	1.2%
Graduated from high school	36.7%	28.6%	46.9%	14.3%	48.4%	47.3%	40.1%	29.9%
Graduated from college/university	31.6%	36.7%	28.4%	29.8%	12.9%	28.7%	39.1%	46.5%
Post-graduate degree	15.7%	27.9%	8.0%	9.9%	24.5%	6.9%	13.2%	19.6%
Other	6.5%	4.1%	3.5%	24.6%	2.0%	7.8%	2.0%	2.4%
<u>Household financial situation<sup>4</sup></u>	3.2	2.9	3.3	3.5	3.0	3.4	2.9	3.1

<sup>4</sup> Financial situation ("Would you say that making ends meet every month is...") measured on a 5-point scale from 1 = *very difficult* to 5 = *very easy*.



**Table 2.4. Sample description: other background information**

	Total	BG	DE	DK	IT	NL	PT	RO
<u>Other</u>								
Product category expertise <sup>5</sup>	3.5	3.4	3.5	3.3	3.9	3.2	3.5	3.7
Purchased [product] in past 12 months:								
Dishwasher	12.9%	9.1%	14.8%	14.4%	17.3%	11.9%	12.3%	10.2%
Washing machine	25.1%	28.0%	20.5%	17.0%	29.0%	20.2%	24.1%	37.3%
Washer-dryer	5.4%	8.3%	2.8%	7.1%	5.0%	3.6%	3.9%	7.5%
Planning to purchase [product]								
Dishwasher	19.3%	25.8%	12.0%	13.4%	21.2%	9.2%	20.5%	33.5%
Washing machine	13.6%	9.5%	13.9%	11.1%	19.3%	11.3%	12.1%	18.2%
Washer-dryer	14.4%	17.6%	7.7%	7.2%	20.1%	6.1%	13.1%	29.4%
Looked up information about [product] in the past month								
Dishwasher	17.5%	16.2%	19.4%	14.4%	21.9%	17.6%	15.1%	17.8%
Washing machine	17.1%	15.2%	14.8%	12.8%	19.8%	20.0%	16.3%	18.4%
Washer-dryer	15.6%	13.9%	17.4%	12.9%	16.2%	14.0%	12.4%	18.1%
Concern for the environment <sup>6</sup>	5.4	5.4	5.4	5.0	5.6	4.9	6.0	5.7
Importance of energy efficiency/consumption								
Extremely important	35.7%	39.7%	40.8%	29.5%	36.6%	21.1%	42.9%	39.4%
Very important	38.9%	35.6%	34.4%	33.9%	39.1%	45.1%	44.0%	39.8%
Fairly important	22.5%	21.4%	22.0%	31.2%	23.0%	30.1%	11.3%	18.6%
Not very important	2.2%	2.6%	1.9%	4.4%	1.2%	2.6%	1.3%	1.6%
Not at all important	0.7%	0.7%	0.9%	1.1%	0.0%	1.1%	0.5%	0.6%
Reason for paying attention to energy efficiency/consumption <sup>7</sup>								
Saving costs	63.0%	72.9%	58.1%	54.4%	63.2%	57.5%	64.5%	70.2%
Protecting the environment	28.5%	19.1%	33.7%	36.1%	29.4%	31.4%	27.3%	22.6%
Owning newest technologies	5.1%	6.6%	4.4%	3.8%	4.8%	4.9%	5.1%	6.0%
Other	0.8%	0.3%	0.4%	1.1%	0.8%	1.3%	1.8%	0.1%
Don't know	2.6%	1.1%	3.3%	4.5%	1.8%	4.9%	1.3%	1.0%

<sup>5</sup> Product category expertise ("I know a great deal about washing machines", "I know a great deal about washer-dryers", "I know a great deal about dishwashers", and "I know more about white goods (e.g. washing machines, dishwashers) than most other people") measured on 7-point scales from 1 = *strongly disagree* to 7 = *strongly agree*.

<sup>6</sup> Environmental concern ("In my daily activities, I am conscious about saving energy" and "I am worried about the environment") measured on 7-point scales from 1 = *strongly disagree* to 7 = *strongly agree*.

<sup>7</sup> Follow-up question for respondents who reported to find energy efficiency/consumption *at least* fairly important.



### 3. Findings: dishwashers

This chapter presents the results for dishwashers. In section 3.1, we examine differences between icon and label variants in terms of subjective (i.e. self-declared) and objective comprehension (i.e. factual understanding). Subsequently, section 3.2 describes the extent to which consumers perceive the information on the tested dishwasher label as relevant, as well as the extent to which they miss information on this label. Finally, section 3.3 examines consumers' choice behaviour.













#### 3.1. Comprehension

In this section, we present the results of the comprehension tasks. For each of the relevant features – water consumption, load capacity, programme duration, and noise level – respondents were exposed to one out of three icon alternatives (see Table 1.1). We assessed comprehension in three ways. For each feature, we first present the results of the part in which the icons were presented **in isolation**. In this part, we assessed subjective (self-declared) as well as objective (factual) comprehension for each icon. **Subjective comprehension** was assessed both before ("Do you think this symbol is clear or unclear?") and after the icon's meaning was explained to the respondent ("Now you know its meaning, do you think this symbol is clear or unclear?"). This allows us to examine the extent to which the perceived clarity of an icon improves after its meaning is explained. **Objective comprehension** was assessed via a multiple choice quiz question. We then present the results of the product identification task in which **objective comprehension** of the icons was measured **in a product context**. In this part, respondents were exposed to a small assortment of dishwashers with full labels and other product information (e.g. price information). For each of the features of interest, they were asked to identify dishwashers with either the highest or the lowest level on that feature (e.g. "Which of these dishwashers uses the smallest amount of water?").

Box 3.1 provides a summary of the comprehension results. The results are described in more detail in the following paragraphs, in which we examine differences in subjective (for isolated icons) and objective comprehension (for isolated icons and in product context) between icon alternatives.

**Box 3.1. Dishwashers: summary of results**

The table below presents the overall results per icon, combining the findings related to subjective and objective comprehension. Relatively well performing icon alternatives are shaded green, and relatively poor performing alternatives are shaded red (icon alternatives shaded yellow perform well on some comprehension measures, but not on others).

Best (green) versus worst (red) performing icons			
Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 39L	 39L	 39L
Number of place settings	 12X	 12X	 12X
Programme duration	 4:00	 4:00	 4:00
Noise level	 72dB	 72dB	 72dB

**3.1.1. Water consumption****Subjective comprehension: isolated icon**




Table 3.1 provides the subjective comprehension results for the water consumption icon. Overall, about 8 out of 10 respondents indicated that the icon was clear or very clear. Subjective understanding significantly depended on the specific icon alternative presented to the respondent.<sup>8</sup> On average, it was highest for icon alternative 1, which was considered (very) clear by 81.4% of the respondents, followed by alternatives 2 (74.7%) and 3 (71.8%). Not surprisingly, subjective understanding significantly improved when the meaning of the icon was explained to respondents.<sup>9</sup> Before the explanation, 72.6% indicated that the icon was (very) clear. This rose to 82.6% after the explanation. The relative performance of the icon alternatives did not significantly

<sup>8</sup> Differences between icon alternatives:  $p < .001$ . The  $p$ -value for the effect of icon alternatives indicates whether the differences between the icon alternatives are statistically significant, which means that they are very unlikely to have occurred by chance. A small  $p$ -value ( $<.05$ ) indicates that there are statistically significant differences in comprehension (here) across the different icon alternatives.

<sup>9</sup> Explanation effect:  $p < .001$ .




depend on whether or not their meaning was explained.<sup>10</sup> Thus, alternative 1 outperformed the other two alternatives both before and after the explanation.

**Table 3.1. Self-declared icon understanding<sup>11</sup>: water consumption**

		Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
		 39L	 39L	 39L	
Total	% (very) clear	81.4%	74.7%	71.8%	77.6%
	% (very) unclear	6.3%	8.9%	7.7%	7.7%
	Average (5-point)	4.3 <sup>a</sup>	4.1 <sup>c</sup>	4.2 <sup>b</sup>	4.2
Before explanation	% (very) clear	77.2%	69.3%	72.3%	72.6%
	% (very) unclear	7.9%	11.3%	9.5%	9.7%
	Average (5-point)	4.2 <sup>a</sup>	3.9 <sup>c</sup>	4.0 <sup>b</sup>	4.0
After explanation	% (very) clear	85.6%	80.2%	82.6%	82.6%
	% (very) unclear	4.7%	6.6%	5.8%	6.1%
	Average (5-point)	4.4 <sup>a</sup>	4.2 <sup>b</sup>	4.3 <sup>b</sup>	4.3

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ . If the superscripts are the same, the means are not significantly different (i.e. the difference is likely due to chance). If the superscripts differ (a vs. b), the difference in means very likely reflects a real difference between the alternatives rather than chance variation.

**Table 3.2. Factual icon understanding: water consumption**

	Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
What do you think this symbol indicates?	 39L	 39L	 39L	
The volume of the dishwasher	5.3%	11.4%	11.3%	9.6%
The water consumption of one wash cycle	88.2% <sup>a</sup>	78.9% <sup>b</sup>	80.4% <sup>b</sup>	82.1%
The machine determines automatically how much detergent is needed (auto-dosing system)	2.1%	3.4%	2.3%	2.6%
The machine has an intensive cleaning programme	0.4%	0.9%	1.3%	0.9%
None of the answers is correct	0.8%	0.6%	0.6%	0.7%
I (really) don't know	3.1%	4.8%	4.1%	4.1%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ . If the superscripts are the same, the percentages are not significantly different (i.e. the difference is likely due to chance). If the superscripts differ (a vs. b), the difference in percentages very likely reflect a real difference between the alternatives rather than chance variation.

<sup>10</sup> There was no icon alternative x explanation interaction:  $p = .269$ .

<sup>11</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

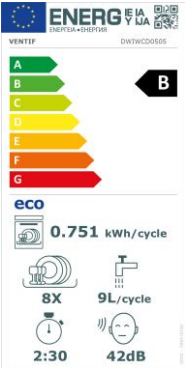
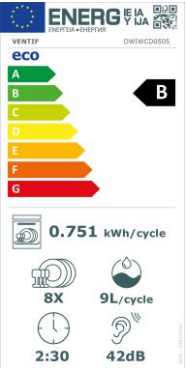

### Objective comprehension: isolated icon

Next, we examined whether consumers actually understood the meaning of the water consumption icon. Table 3.2 shows the results of the multiple choice quiz question. When the water consumption icon was presented in isolation, about 8 out of 10 respondents accurately understood that the icon represents the water consumption of one cycle. Objective comprehension significantly differed between icon alternatives.<sup>12</sup> Consistent with the subjective comprehension results, objective comprehension was higher for alternative 1 (88.2%) as compared to alternatives 2 (78.9%) and 3 (80.4%).

### Objective comprehension: in product context

Next, we examined objective comprehension in a product context. Respondents were exposed to a small assortment of eight dishwashers. For each dishwasher, an energy label was shown (respondents saw one out of three variants) as well as other product information (e.g. number of programmes, presence of automatic load detection, price information). In order to assess objective comprehension of the water consumption icon, respondents were asked to select the dishwasher(s) with either the highest or the lowest water consumption. Table 3.3 shows the results, averaged across the two groups who identified best versus worst performing products. In total, about half of the respondents (54.6%) identified the correct dishwasher(s). Objective comprehension did not differ between icon alternatives (55.0% for icon alternative 1, 57.2% for icon alternative 2, and 56.4% for icon alternative 3).<sup>13</sup>

**Table 3.3. Accurate product identification: water consumption**

Alternative 1 (N = 1100)	Alternative 2 (N = 1082)	Alternative 3 (N = 1082)	Total (N = 3264)
			
55.0% <sup>a</sup>	57.2% <sup>a</sup>	56.4% <sup>a</sup>	56.2%

*Note* – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ . If the superscripts are the same, the percentages are not significantly different (i.e. the difference is likely due to chance). If the superscripts differ (a vs. b), the difference in percentages very likely reflect a real difference between the alternatives rather than chance variation. For this and other tables, if the correct response involves the selection of multiple products (i.e. when several products have the best or worst performance), a response is considered correct if the selection includes at least one correct and no incorrect products.

<sup>12</sup> Differences between icon alternatives:  $p < .001$ .




<sup>13</sup> No differences between icon alternatives:  $p = .813$ .

### 3.1.2. Load capacity

#### Subjective comprehension: isolated icon

Table 3.4 shows the self-declared understanding of the load capacity icon. For this icon, the relative performance of the various icon alternatives strongly depended on whether the icon's meaning was explained to respondents.<sup>14</sup> Looking at the extent to which the icons are self-explanatory, alternative 2 was immediately perceived as most clear (58.2%), followed by alternative 1 (53.9%). Alternative 3 was perceived as least clear before the explanation (49.2%). In contrast, after the explanation, perceived clarity was equally high – at about 60% – for all alternatives (see Table 3.4).

**Table 3.4. Self-declared icon understanding<sup>15</sup>: load capacity**

		Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
		 12X	 12X	 12X	
Total	% (very) clear	56.4%	58.3%	54.6%	56.5%
	% (very) unclear	22.2%	17.9%	20.6%	20.1%
	Average (5-point)	3.6 <sup>ab</sup>	3.7 <sup>a</sup>	3.5 <sup>b</sup>	3.6
Before explanation	% (very) clear	53.9%	58.2%	49.2%	53.8%
	% (very) unclear	25.2%	18.3%	24.8%	22.6%
	Average (5-point)	3.5 <sup>b</sup>	3.7 <sup>a</sup>	3.4 <sup>c</sup>	3.5
After explanation	% (very) clear	58.9%	58.4%	60.0%	59.0%
	% (very) unclear	19.2%	17.5%	16.3%	17.6%
	Average (5-point)	3.6 <sup>a</sup>	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

#### Objective comprehension: isolated icon

Looking at the results on the quiz question (see Table 3.5), we find that significantly more participants identified the correct meaning of the icon when exposed to alternative 3 (44.3%) as compared to the alternatives 1 (33.3%) and 2 (29.6%).<sup>16</sup>

#### Objective comprehension: in product context

Table 3.6 shows the results of the part in which respondents were asked to identify dishwashers with either the highest or lowest load capacity among a set of 8 dishwashers. Objective comprehension (i.e. accurate identification of the product with the highest/lowest load capacity) was significantly higher for icon alternative 1 (80.0% correct) and 2 (78.3%) than for alternative 3 (71.9%).<sup>17</sup>




<sup>14</sup> Significant icon alternative x explanation interaction:  $p < .001$ .

<sup>15</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

<sup>16</sup> Differences between icon alternatives:  $p = .004$ .

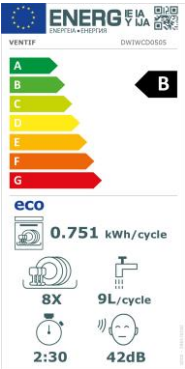
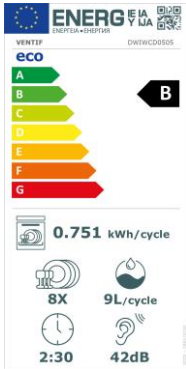

<sup>17</sup> Differences between icon alternatives:  $p < .001$ .

**Table 3.5. Factual icon understanding: load capacity**

	Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
What do you think this symbol indicates?	 12X	 12X	 12X	
That a maximum of 36 plates and 36 glasses fit into the dishwasher	7.7%	8.1%	4.7%	6.8%
That a maximum of 12 plates and 12 glasses fit into the dishwasher	41.5%	46.0%	28.4%	38.5%
That the dishwasher can properly clean and dry a maximum of 12 standard place settings	33.3% <sup>b</sup>	29.6% <sup>b</sup>	44.3% <sup>a</sup>	35.8%
That the dishwasher has 12 different wash programmes	5.2%	5.9%	8.3%	6.6%
None of the answers is correct	2.0%	1.9%	1.7%	1.9%
I (really) don't know	10.3%	8.5%	12.6%	10.5%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

**Table 3.6. Accurate product identification: load capacity**

Alternative 1 (N = 1217)	Alternative 2 (N = 1030)	Alternative 3 (N = 1062)	Total (N = 3309)
			
80.0% <sup>a</sup>	78.3% <sup>a</sup>	71.9% <sup>b</sup>	76.8%




Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 3.1.3. Programme duration

Table 3.7 provides the results for self-declared understanding of the programme duration icon. About 6 out of 10 respondents indicated that they found the icon (very) clear. Perceived clarity was slightly higher for alternatives 2 (65.5% found it (very) clear) and 3 (64.5%), as compared to alternative 1 (61.1%).<sup>18</sup>

<sup>18</sup> Differences between icon alternatives:  $p = .005$ .

**Table 3.7. Self-declared icon understanding<sup>19</sup>: programme duration**




		Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
		 4:00	 4:00	 4:00	
<i>Total</i>	% (very) clear	61.1%	65.5%	64.5%	63.9%
	% (very) unclear	19.4%	14.4%	15.9%	16.4%
	Average (5-point)	3.7 <sup>b</sup>	3.8 <sup>a</sup>	3.8 <sup>a</sup>	3.8
<i>Before explanation</i>	% (very) clear	59.6%	63.3%	63.5%	62.3%
	% (very) unclear	18.5%	14.3%	14.2%	15.5%
	Average (5-point)	3.7 <sup>b</sup>	3.8 <sup>a</sup>	3.8 <sup>a</sup>	3.8
<i>After explanation</i>	% (very) clear	62.6%	67.8%	65.5%	65.4%
	% (very) unclear	20.3%	14.6%	17.5%	17.3%
	Average (5-point)	3.7 <sup>b</sup>	3.9 <sup>a</sup>	3.8 <sup>ab</sup>	3.8

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

#### Objective comprehension: isolated icon

About half of the respondents identified the accurate meaning of the programme duration icon in the comprehension quiz (Table 3.8). There were no significant differences between the icon alternatives.<sup>20</sup>

**Table 3.8. Factual icon understanding: programme duration**

	Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
<i>What do you think this symbol indicates?</i>	 4:00	 4:00	 4:00	
The availability of a timer function to delay the start of the programme to a later time (delay start)	25.2%	25.0%	28.6%	26.3%
The durability of the machine	3.0%	3.5%	3.1%	3.2%
<u>The duration of the tested programme loaded at full capacity</u>	53.2% <sup>a</sup>	55.1% <sup>a</sup>	53.1% <sup>a</sup>	53.9%
The machine has a digital clock	6.4%	5.0%	3.9%	5.0%
None of the answers is correct	2.3%	2.0%	2.5%	2.3%
I (really) don't know	9.9%	9.4%	8.8%	9.3%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

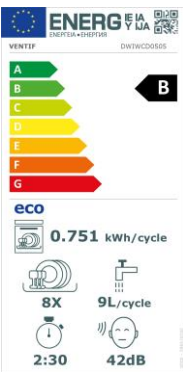
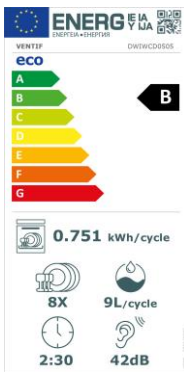

<sup>19</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

<sup>20</sup> No differences between icon alternatives:  $p = .553$ .

### Objective comprehension: in product context

Respondents were also asked to identify the dishwasher(s) with either the shortest or longest duration of the tested programme (two separate respondent groups). Table 3.9 shows the percentage of respondents who identified the correct dishwasher(s) across the two groups. Icon alternative 1 (86.2%) outperformed alternative 2 (82.7%), with alternative 3 falling in between (85.9%).<sup>21</sup>

**Table 3.9. Accurate product identification: programme duration**

Alternative 1 (N = 1217)	Alternative 2 (N = 1030)	Alternative 3 (N = 1062)	Total (N = 3309)
			
86.2% <sup>a</sup>	82.7% <sup>b</sup>	85.9% <sup>ab</sup>	85.0%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 3.1.4. Noise level

#### Subjective comprehension




Self-declared understanding of the icon representing the noise level of the dishwasher was relatively high: 85.2% thought the icon was (very) clear (see Table 3.10). There were very small yet statistically significant differences between the icon alternatives.<sup>22</sup> Alternative 2 was perceived as slightly clearer (86.8%) as compared to alternative 3 (83.5%), with alternative 1 falling in between (85.2%).

<sup>21</sup> Marginal significant differences between icon alternatives:  $p = .070$ .

<sup>22</sup> Differences between icon alternatives:  $p = .023$ .



**Table 3.10. Self-declared icon understanding<sup>23</sup>: noise level**




		Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
		 72dB	 72dB	 72dB	
<i>Total</i>	% (very) clear	85.2%	86.8%	83.5%	85.2%
	% (very) unclear	4.8%	4.0%	6.4%	5.1%
	Average (5-point)	4.4 <sup>ab</sup>	4.4 <sup>a</sup>	4.4 <sup>b</sup>	4.4
<i>Before explanation</i>	% (very) clear	83.1%	84.3%	81.9%	83.1%
	% (very) unclear	5.5%	4.7%	8.1%	6.1%
	Average (5-point)	4.3 <sup>ab</sup>	4.4 <sup>a</sup>	4.3 <sup>b</sup>	4.4
<i>After explanation</i>	% (very) clear	87.3%	89.4%	85.2%	87.3%
	% (very) unclear	4.1%	3.2%	4.8%	4.0%
	Average (5-point)	4.5 <sup>ab</sup>	4.5 <sup>a</sup>	4.4 <sup>b</sup>	4.5

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

### Objective comprehension: isolated icon

About 9 out of 10 respondents accurately identified the meaning of the noise level icon in the objective comprehension quiz. There were no differences between the icon alternatives.<sup>24</sup>

**Table 3.11. Factual icon understanding: noise level**

	Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1152)	Total (N = 3290)
<i>What do you think this symbol indicates?</i>	 72dB	 72dB	 72dB	
<u>The noise level</u>	88.3% <sup>a</sup>	89.1% <sup>a</sup>	90.3% <sup>a</sup>	89.3%
The machine is connected to Wi-Fi and can be controlled and monitored using a smartphone	2.1%	1.6%	1.4%	1.7%
The machine has a silent mode	4.4%	4.1%	2.8%	3.7%
The vibrations produced by the machine	3.1%	3.1%	3.0%	3.1%
None of the answers is correct	0.5%	0%	0.3%	0.2%
I (really) don't know	1.6%	2.1%	2.3%	2.0%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .


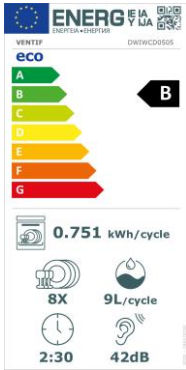

<sup>23</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

<sup>24</sup> No differences between icon alternatives:  $p = .333$ .

### Objective comprehension: in product context

When exposed to a small assortment of dishwashers with energy labels and other product information, 67.8% of the respondents accurately identified either the most or least quiet dishwasher (depending on what was asked for), see Table 3.12. This percentage did not significantly differ between icon alternatives.<sup>25</sup>

**Table 3.12. Accurate product identification: noise level**

Alternative 1 (N = 1217)	Alternative 2 (N = 1030)	Alternative 3 (N = 1062)	Total (N = 3309)
			
66.3% <sup>a</sup>	69.2% <sup>a</sup>	68.2% <sup>a</sup>	67.8%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### Preference regarding noise level

Respondents were also asked whether they preferred to have the noise level presented on the energy label in **decibels**, in **categories** (quiet, medium, noisy), or **both**. 45.1% of the respondents indicated to prefer information on the noise level in both decibels and categories, 25.7% preferred an indication in decibels, and 20.0% in categories. The remainder of the respondents (9.2%) did not have a clear preference.


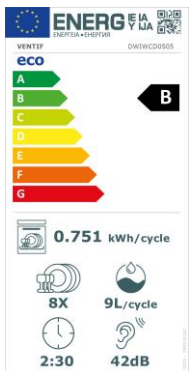

### 3.1.5. Energy efficiency class and energy consumption

In the product identification task, respondents were also asked to identify the best or worst performing dishwasher(s) in terms of energy performance. Table 3.13 shows that the percentage of respondent who identified the correct dishwasher(s) did not depend on the label alternative.<sup>26</sup> This is not surprising given that the energy efficiency scale and the way in which energy consumption information is provided did not differ between the label alternatives. Interestingly, objective understanding of the energy efficiency class (77.4% correct) was substantially higher than understanding of the energy consumption (54.6%).

<sup>25</sup> No differences between icon alternatives:  $p = .45$ .

<sup>26</sup> No differences between label alternatives:  $p = .98$  (energy efficiency class) and  $p = .37$  (energy consumption).

**Table 3.13. Accurate product identification: energy efficiency/consumption**

	Alternative 1 (N = 1100)	Alternative 2 (N = 1082)	Alternative 3 (N = 1082)	Total (N = 3264)
				
Energy efficiency class	76.6% <sup>a</sup>	79.6% <sup>a</sup>	76.2% <sup>a</sup>	77.4%
Energy consumption	53.0% <sup>a</sup>	55.3% <sup>a</sup>	55.6% <sup>a</sup>	54.6%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

### 3.1.6. Understanding of other label information

After testing comprehension of the icons in isolation, the label was presented in its entirety and respondents received a number of true/false statements to assess their understanding (1) of the 'ECO' programme as the tested (standard) programme, (2) that all information on the label pertains to this tested programme, (3) that information is provided per cycle (rather than per year). Table 3.14 shows the percentage of respondents who correctly responded to *all* statements measuring understanding of a certain information aspect (as a summary indicator), as well as the percentage correct for each individual statement.<sup>27</sup>

#### Interpretation of the 'ECO' programme

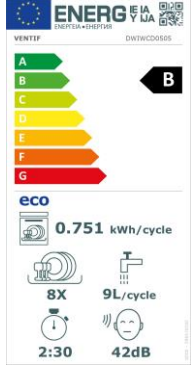
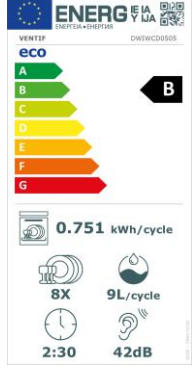
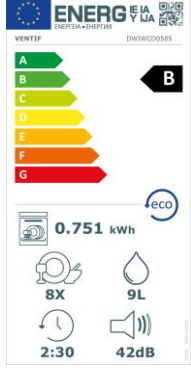
75.5% of the respondents falsely believed that 'ECO' refers to the dishwasher having an ecolabel, and 82.7% assumed that it was a special programme, not available on all dishwashers. Overall, less than 1 out of 10 respondents accurately indicated that neither of these were true. Overall, there were no differences in the percentage of correct responses across the label alternatives.

#### Understanding that information pertains to the tested programmed

More respondents accurately understood that all information on the label pertains to the tested ('ECO') programme. 23.0% of the respondents responded correctly to all three statements (see Table 3.14). This percentage was significantly higher for label alternative 2 (25.2%) as compared to label alternative 3 (21.6%), with alternative 1 falling in between (22.1%). In label alternative 2, the programme name was displayed at the top of the label, above the energy efficiency scale.

<sup>27</sup> Note that these percentages may be high due to guessing (probability that a correct answer is provided based on guessing is 50% per statement).

**Table 3.14. Understanding of other label information: true/false questions**

% of respondents who gave the <u>correct</u> answer (true/false)	Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1153)	Total (N = 3291)
				
<i>Interpretation of 'ECO'</i> (% all statements correct) <sup>28</sup>	<b>7.1%<sup>a</sup></b>	<b>7.9%<sup>a</sup></b>	<b>6.3%<sup>a</sup></b>	<b>7.1%</b>
1. The dishwasher has an ecolabel, which shows that the dishwasher does less harm to the environment than similar dishwashers (false). <sup>29</sup>	28.1% <sup>a</sup>	23.4% <sup>b</sup>	22.6% <sup>b</sup>	24.5%
2. This dishwasher has a special ECO programme, only available in some dishwashers, which uses less energy and water than other programmes (false). <sup>30</sup>	15.6% <sup>b</sup>	21.5% <sup>a</sup>	14.3% <sup>b</sup>	17.3%
<i>Understanding that the information pertains to the tested programme</i> (% all statements correct) <sup>31</sup>	<b>22.1%<sup>ab</sup></b>	<b>25.2%<sup>a</sup></b>	<b>21.6%<sup>b</sup></b>	<b>23.0%</b>
3. The top part of the label pertains to the intensive programme and the bottom part to the ECO programme (false). <sup>32</sup>	47.1% <sup>b</sup>	58.8% <sup>a</sup>	48.8% <sup>b</sup>	51.9%
4. All information on the label pertains to the ECO programme (true). <sup>33</sup>	52.9% <sup>a</sup>	50.1% <sup>a</sup>	51.2% <sup>a</sup>	51.3%
5. The label displays the energy efficiency, energy consumption and water consumption of the dishwasher when the ECO programme is being used (true). <sup>34</sup>	72.0% <sup>a</sup>	67.2% <sup>b</sup>	71.4% <sup>ab</sup>	70.1%

<sup>28</sup> No differences between label alternatives:  $p = .334$ .<sup>29</sup> Differences between label alternatives:  $p = .032$ .<sup>30</sup> Differences between label alternatives:  $p < .001$ .<sup>31</sup> Marginally significant differences between label alternatives:  $p = .074$ .<sup>32</sup> Differences between label alternatives:  $p < .001$ .<sup>33</sup> No differences between label alternatives:  $p = .474$ .<sup>34</sup> Differences between label alternatives:  $p = .046$ .

% of respondents who gave the correct answer (true/false)	Alternative 1 (N = 960)	Alternative 2 (N = 1178)	Alternative 3 (N = 1153)	Total (N = 3291)
<i>Understanding that information is provided per cycle</i> (% all statements correct) <sup>35</sup>	<b>44.2%<sup>a</sup></b>	<b>44.1%<sup>a</sup></b>	<b>36.2%<sup>b</sup></b>	<b>41.4%</b>
6. The water consumption of this dishwasher is 9 litres <u>per wash cycle</u> when the ECO programme is being used (true). <sup>36</sup>	82.2% <sup>a</sup>	77.6% <sup>b</sup>	78.8% <sup>b</sup>	79.4%
7. The energy consumption of this dishwasher is 0.751 kWh <u>per year</u> when the ECO programme is being used (false). <sup>37</sup>	51.2% <sup>b</sup>	54.2% <sup>a</sup>	45.6% <sup>b</sup>	50.3%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

### Understanding that information is provided per cycle

About 4 out of 10 respondents understood that information on the label is provided per cycle and not per year (both statements correct, see Table 3.14). There were significant differences in understanding across label alternatives. Label alternative 1 and 2 – where 'cycle' was indicated in words – yielded a higher percentage of correct responses to both statements compared to label variant 3 – where 'cycle' was represented graphically.

### 3.2. Perceived relevance and missing of information

For the features of interest – water consumption, load capacity, programme duration, and noise level, we asked respondents how important information about the feature would be to them when comparing dishwashers and how important it would be for them that the information is displayed on the energy label. Results are presented in Table 3.15. Overall, the majority of the respondents indicated that they found the features, and receiving information on them via the label, very or extremely important. Information on the water consumption of dishwashers was seen as most relevant.

<sup>35</sup> Differences between label alternatives:  $p < .001$ .

<sup>36</sup> Differences between label alternatives:  $p = .037$ .

<sup>37</sup> Differences between label alternatives:  $p < .001$ .

**Table 3.15. Perceived relevance of information**

	% not at all important / not very important	% very important / extremely important	Average (5-point)
How important would information about .... be to you when comparing dishwashers?			
water consumption	4.2%	71.0%	4.0
load capacity	8.9%	57.7%	3.7
programme duration	10.6%	54.1%	3.6
noise level	8.7%	60.5%	3.8
How important would it be to you that this information is displayed on the energy label?			
water consumption	4.4%	71.5%	4.0
load capacity	11.1%	58.7%	3.7
programme duration	11.0%	66.5%	3.7
noise level	7.9%	63.4%	3.8

Note – N = 3290.

We also asked respondents whether they missed important information on the tested label. 92.3% of the respondents reported that they did not miss any information.

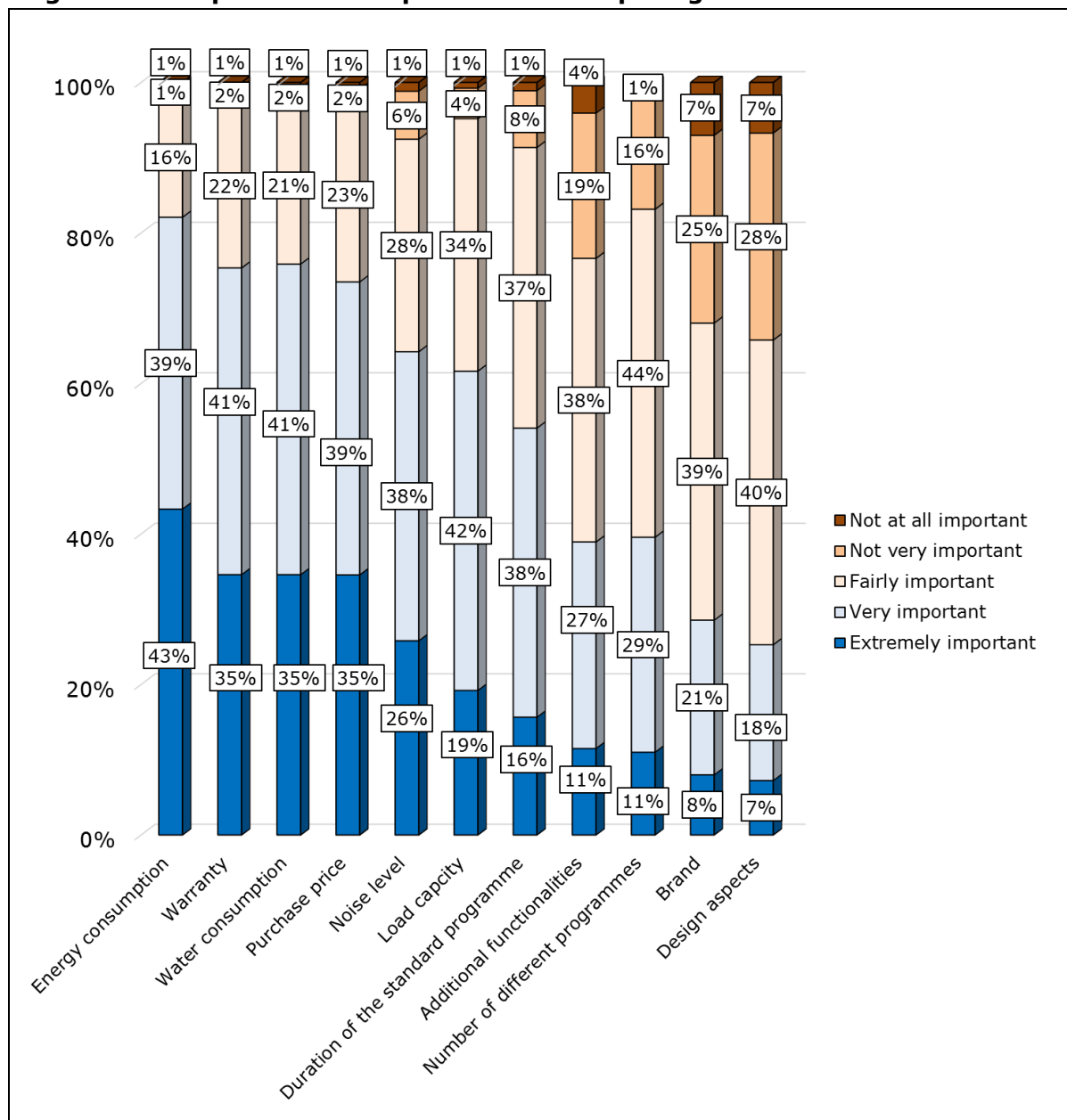
In the final part of the questionnaire, we asked respondents how important they would consider different aspects when comparing different dishwashers (see Figure 3.1).<sup>38</sup> From the four features for which comprehension was tested in this study, namely water consumption, load capacity, programme duration and noise level, the water consumption is considered (very or extremely) important by most respondents (75.9%) and the programme duration by least respondents (53.8%).

### 3.3. Product choice


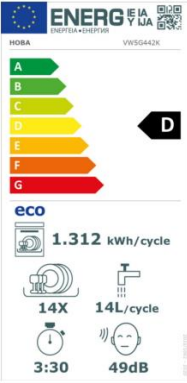



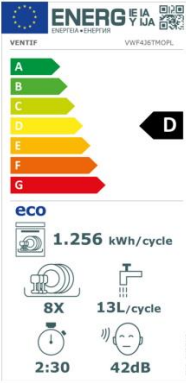



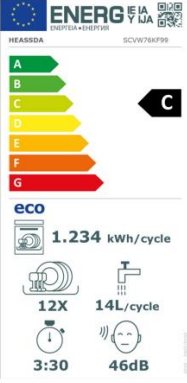



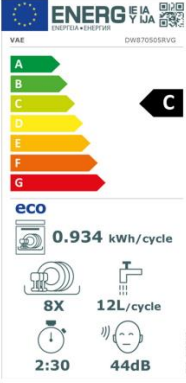


In the product identification task, respondents were exposed to a set of eight dishwashers and asked to identify dishwashers with a specific feature as a measure of objective comprehension (see section 3.1). After the product identification questions, respondents were also asked which dishwasher they would buy if they would have to make a choice among the presented dishwashers. The choice shares per dishwasher are presented in Table 3.16. In this hypothetical purchase situation, most respondents opted for the dishwashers of the (fictive) brands VAE (€1092) and Heassda (€949), which were most durable and most energy efficient, but were also relatively expensive.

<sup>38</sup> Note that this question was asked in the fifth and last part of the survey. The focus on energy performance and related aspects in the previous parts may have increased the perceived importance of these aspects in this part of the questionnaire.

**Figure 3.1. Importance of aspects when comparing dishwashers**



**Table 3.16. Choice shares per dishwasher<sup>39</sup>**

% of respondents who selected the specific dishwasher			
 <p><b>Hoba</b> € 306 Minimum levensduur (in jaren): 7 Aantal programma's: 5 Startuitlet: nee Automatische beladingsherkenning: nee</p>  <p>4.1%</p>	 <p><b>Hoba</b> € 496 Minimum levensduur (in jaren): 7 Aantal programma's: 5 Startuitlet: nee Automatische beladingsherkenning: nee</p>  <p>13.8%</p>	 <p><b>Ventif</b> € 574 Minimum levensduur (in jaren): 7 Aantal programma's: 7 Startuitlet: ja Automatische beladingsherkenning: nee</p>  <p>3.1%</p>	 <p><b>Ventif</b> € 899 Minimum levensduur (in jaren): 7 Aantal programma's: 7 Startuitlet: ja Automatische beladingsherkenning: nee</p>  <p>6.8%</p>
 <p><b>Heassda</b> € 591 Minimum levensduur (in jaren): 11 Aantal programma's: 5 Startuitlet: ja Automatische beladingsherkenning: nee</p>  <p>2.4%</p>	 <p><b>Heassda</b> € 949 Minimum levensduur (in jaren): 11 Aantal programma's: 5 Startuitlet: ja Automatische beladingsherkenning: nee</p>  <p>26.7%</p>	 <p><b>VAE</b> € 999 Minimum levensduur (in jaren): 11 Aantal programma's: 10 Startuitlet: ja Automatische beladingsherkenning: ja</p>  <p>2.6%</p>	 <p><b>VAE</b> € 1092 Minimum levensduur (in jaren): 11 Aantal programma's: 10 Startuitlet: ja Automatische beladingsherkenning: ja</p>  <p>32.0%</p>

<sup>39</sup> 8.6% of the respondents indicated that they did not know which product they would buy.



## 4. Findings: washing machines

### 4.1. Tested programme

In the first part of the questionnaire, respondents were asked to imagine a new washing machine that featured a range of different programmes. They were informed that one of the programmes that the washing machine offered was a programme for (normally soiled) cotton laundry that is washable at 40°C or 60°C according to the garment label, and that the programme cleans this laundry simultaneously in the same wash cycle. After reading the description of the programme, respondents read that, in the near future, all manufacturers will be obliged to offer this programme on their washing machines. Respondents were then asked to indicate (1) which name, according to them, would fit this programme best, (2) at which temperature they thought the laundry would be washed if they would run this programme and load the drum fully, and (3) whether they would use this programme for their daily laundry.

42% of the respondents thought the “ECO 40-60 programme” would best fit the described programme (see Table 4.1). Most respondents falsely – but perhaps not surprisingly – believed that if they were to run this programme, the laundry would be washed at a temperature between 40°C and 60°C (71.0%, Table 4.1). Only 4.3% accurately believed that the laundry would be washed at a temperature lower than 40°C. Furthermore, 81.1% of the respondents indicated that they were likely to use this programme for their daily laundry, while 10.9% indicated that they were not likely to use it (1.6% of the respondents indicated that they don’t do the laundry themselves).

**Table 4.1. Perception regarding the tested programme**













	Percentage (N = 3297)
<i>According to you, which name fits this programme best?</i>	
The “40-60 programme”	24.8%
The “ECO 40-60 programme”	42.0%
The “Standard 40-60 programme”	31.6%
Other	1.7%
<i>At which temperature do you think the laundry will be washed?</i>	
Higher than 60°C	3.7%
Between 40°C and 60°C	71.0%
At 40°C	21.1%
Lower than 40°C	4.3%

### 4.2. Comprehension

Box 4.1 provides a summary of the comprehension results. The results are described in more detail in the following paragraphs, in which we examine differences in subjective (for isolated icons) and objective comprehension (for isolated icons and in product context) between icon alternatives. For a detailed description on how comprehension was measured, see sections 2.1 and 3.1.

**Box 4.1. Washing machines: summary of results**

The table below presents the overall results per icon, combining the findings related to subjective and objective comprehension. Relatively well performing icon alternatives are shaded green, and relatively poor performing alternatives are shaded red (icon alternatives shaded yellow perform well on some comprehension measures, but not on others).

Best (green) versus worst (red) performing icons			
Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 <b>39L</b>	 <b>39L</b>	 <b>39L</b>
Maximum load	 <b>8kg</b>	 <b>8kg</b>	 <b>8kg</b>
Programme duration	 <b>4:00</b>	 <b>4:00</b>	 <b>4:00</b>
Noise level	 <b>72dB</b>	 <b>72dB</b>	 <b>72dB</b>

**4.2.1. Water consumption****Subjective comprehension: isolated icon**




The subjective comprehension results for the water consumption icon are in Table 4.2. Overall, three-quarters of the respondents indicated that the icon was clear or very clear. Self-declared understanding significantly depended on the specific icon alternative the respondent was exposed to.<sup>40</sup> On average, understanding was highest for icon alternative 1, which was considered (very) clear by 79.8% of the respondents, followed by alternatives 3 (73.9%) and 2 (70.3%), for which the level of understanding did not significantly differ. Again, and not surprisingly, subjective understanding significantly improved after respondents were informed about the meaning of the icon.<sup>41</sup> Before the explanation, about 7 in 10 respondents indicated

<sup>40</sup> Differences between icon alternatives:  $p < .001$ . The  $p$ -value for the effect of icon alternatives indicates whether the differences between the icon alternatives are statistically significant, which means that they are very unlikely to have occurred by chance. A small  $p$ -value ( $< .05$ ) indicates that there are statistically significant differences in identification/choice percentages or average comprehension scores across the different icon alternatives.

<sup>41</sup> Explanation effect:  $p < .001$ .




that the icon was (very) clear. After the explanation, 8 in 10 did so. The relative performance of the icon alternatives did not significantly depend on whether or not their meaning was explained.<sup>42</sup> Thus, alternative 1 outperformed the other two alternatives both before and after the explanation.

**Table 4.2. Self-declared icon understanding<sup>43</sup>: water consumption**

		Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
		 39L	 39L	 39L	
Total	% (very) clear	79.8%	70.3%	73.9%	74.8%
	% (very) unclear	6.2%	10.6%	9.9%	8.9%
	Average (5-point)	4.3 <sup>a</sup>	4.0 <sup>b</sup>	4.1 <sup>b</sup>	4.1
Before explanation	% (very) clear	75.2%	64.7%	68.6%	69.6%
	% (very) unclear	8.1%	13.0%	12.2%	11.0%
	Average (5-point)	4.1 <sup>a</sup>	3.9 <sup>b</sup>	3.9 <sup>b</sup>	4.0
After explanation	% (very) clear	84.2%	76.0%	79.1%	79.9%
	% (very) unclear	4.4%	8.3%	7.7%	6.7%
	Average (5-point)	4.4 <sup>a</sup>	4.2 <sup>b</sup>	4.2 <sup>b</sup>	4.3

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

**Table 4.3. Factual icon understanding: water consumption**

	Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
What do you think this symbol indicates?	 39L	 39L	 39L	
The volume of the drum	3.7%	11.7%	9.6%	8.2%
The water consumption of one wash cycle	89.3% <sup>a</sup>	79.0% <sup>b</sup>	80.9% <sup>b</sup>	83.3%
The machine determines automatically how much detergent is needed (auto-dosing system)	2.8%	2.4%	2.6%	2.6%
The machine has an intensive cleaning programme	0.5%	0.7%	0.7%	0.6%
None of the answers is correct	0.4%	1.3%	0.8%	0.8%
I (really) don't know	3.2%	4.9%	5.4%	4.5%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

<sup>42</sup> There was no icon alternative x explanation interaction:  $p = .802$ .

<sup>43</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.


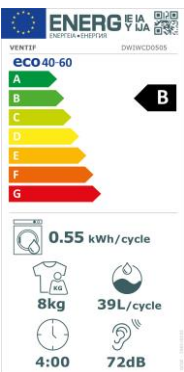
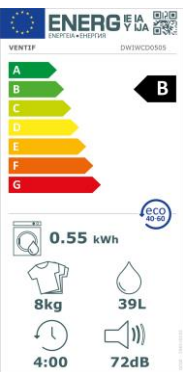
### Objective comprehension: isolated icon

Next, we examined via a multiple choice quiz question whether respondents actually understood the meaning of the water consumption icon (see Table 4.3). When the water consumption icon was presented in isolation, about 8 out of 10 respondents accurately indicated that the icon represents the water consumption of one wash cycle. Objective comprehension significantly differed between icon alternatives.<sup>44</sup> Consistent with the subjective comprehension results, objective comprehension was higher for alternative 1 (89.3%) as compared to alternatives 2 (79.0%) and 3 (80.9%).

### Objective comprehension: in product context

In order to assess objective comprehension of the water consumption icon in a product context, respondents were asked to select the washing machine(s) with either the highest or the lowest water consumption. Table 4.4 shows the results. In total, about half of the respondents identified the correct washing machine(s). The various icon alternatives performed equally well.<sup>45</sup>

**Table 4.4. Accurate product identification: water consumption**

Alternative 1 (N = 1098)	Alternative 2 (N = 1078)	Alternative 3 (N = 1130)	Total (N = 3306)
			
49.7% <sup>a</sup>	46.6% <sup>a</sup>	48.6% <sup>a</sup>	48.3%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 4.2.2. Load capacity

#### Subjective comprehension: isolated icon




Table 4.5 shows the results on self-declared understanding of the load capacity icon. Subjective understanding was high, as in total, 90.1% of the respondents perceived the load capacity icon as (very) clear. There were no differences in understanding across icon alternatives, neither before nor after the meaning of the icon was explained.<sup>46</sup>

<sup>44</sup> Differences between icon alternatives:  $p < .001$ .

<sup>45</sup> No differences between icon alternatives:  $p = .936$ .




<sup>46</sup> No differences across icon alternative:  $p = .141$ , explanation effect:  $p = .004$ . No icon alternative x explanation interaction:  $p = .775$ .

**Table 4.5. Self-declared icon understanding<sup>47</sup>: load capacity**

		Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
		 8kg	 8kg	 8kg	
<i>Total</i>	% (very) clear	90.7%	90.2%	89.4%	90.1%
	% (very) unclear	2.2%	2.3%	3.5%	2.7%
	Average (5-point)	4.6 <sup>a</sup>	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5
<i>Before explanation</i>	% (very) clear	90.4%	89.6%	89.2%	89.7%
	% (very) unclear	2.8%	2.7%	4.1%	3.2%
	Average (5-point)	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5
<i>After explanation</i>	% (very) clear	91.1%	90.8%	89.6%	90.5%
	% (very) unclear	1.7%	2.0%	2.8%	2.2%
	Average (5-point)	4.6 <sup>a</sup>	4.6 <sup>a</sup>	4.5 <sup>a</sup>	4.5

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

**Table 4.6. Factual icon understanding: load capacity**

	Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
<i>What do you think this symbol indicates?</i>	 8kg	 8kg	 8kg	
The weight of the machine	2.8%	2.1%	2.9%	2.6%
The machine senses the load and adjusts the programme accordingly (automatic load detection)	2.8%	3.5%	2.6%	3.0%
The number of garments that the machine can wash (load capacity)	20.8%	21.1%	20.5%	20.8%
<u>The maximum weight of the (dry) laundry that the machine can wash (load capacity)</u>	72.6% <sup>a</sup>	71.7% <sup>a</sup>	72.6% <sup>a</sup>	72.3%
None of the answers is correct	0.3%	0.8%	0.3%	0.5%
I (really) don't know	0.7%	0.8%	1.1%	0.9%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### Objective comprehension: isolated icon

The results of the multiple choice quiz question reveal that about 7 out of 10 respondents correctly understood that the load capacity icon represents the maximum weight of the (dry) laundry that the machine can wash (see Table 4.6). Consistent

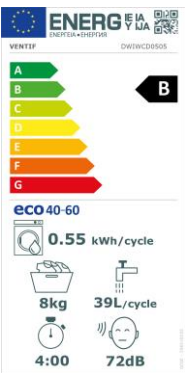
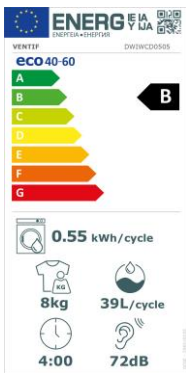

<sup>47</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

with the subjective comprehension results, there were no differences in objective comprehension of the load capacity icon across icon alternatives.<sup>48</sup>

### Objective comprehension: in product context

In the product identification task, respondents had to identify the washing machine(s) with either the highest or lowest load capacity. Table 4.7 shows the results. About 8 in 10 respondents identified the correct washing machine(s). Consistent with the results for the icons in isolation, there were no differences across icon alternatives when the information was presented in a product context.<sup>49</sup>

**Table 4.7. Accurate product identification: load capacity**

Alternative 1 (N = 1016)	Alternative 2 (N = 1140)	Alternative 3 (N = 1097)	Total (N = 3253)
			
84.0% <sup>a</sup>	82.9% <sup>a</sup>	80.8% <sup>a</sup>	82.5%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 4.2.3. Programme duration

#### Subjective comprehension: isolated icon

Table 4.8 shows the results for subjective understanding of the icon representing the duration of the tested programme. 60.2% of the respondents indicated that the programme duration icon was (very) clear. There were no differences in subjective understanding between icon alternatives<sup>50</sup>, neither before nor after the meaning of the icon was explained to respondents<sup>51</sup>.




<sup>48</sup> No differences between icon alternatives:  $p = .375$ .

<sup>49</sup> No differences between icon alternatives:  $p = .135$ .

<sup>50</sup> No differences between icon alternatives:  $p = .343$ .




<sup>51</sup> No explanation effect:  $p = .971$  and no icon alternative x explanation interaction:  $p = .221$ .

**Table 4.8. Self-declared icon understanding<sup>52</sup>: programme duration**

		Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
		 4:00	 4:00	 4:00	
<i>Total</i>	% (very) clear	60.4%	59.3%	60.9%	60.2%
	% (very) unclear	18.8%	19.3%	19.6%	19.2%
	Average (5-point)	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7
<i>Before explanation</i>	% (very) clear	58.8%	58.7%	61.4%	59.6%
	% (very) unclear	18.1%	17.8%	17.8%	17.9%
	Average (5-point)	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7
<i>After explanation</i>	% (very) clear	62.1%	59.9%	60.5%	60.8%
	% (very) unclear	19.5%	20.8%	21.3%	20.5%
	Average (5-point)	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7 <sup>a</sup>	3.7

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

**Table 4.9. Factual icon understanding: programme duration**

	Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
<i>What do you think this symbol indicates?</i>	 4:00	 4:00	 4:00	
The availability of a timer function to delay the start of the programme to a later time (delay start)	29.0%	29.7%	29.8%	29.5%
The durability of the machine	2.3%	2.2%	2.6%	2.4%
<u>The duration of the tested programme loaded at full capacity</u>	51.8% <sup>a</sup>	48.0% <sup>a</sup>	49.3% <sup>a</sup>	49.8%
The machine has a digital clock	3.9%	8.3%	5.9%	6.0%
None of the answers is correct	2.0%	1.8%	1.9%	1.9%
I (really) don't know	11.0%	10.0%	10.5%	10.5%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### Objective comprehension: isolated icon

Via a multiple choice question we examined whether respondents understood that the programme duration icon reflects the duration of the tested programme loaded at full capacity. About 5 out of 10 respondents selected the correct answer (see Table 4.9).

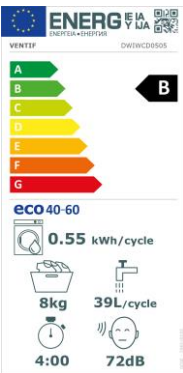
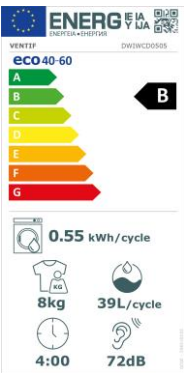
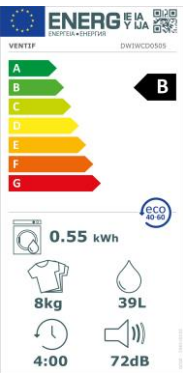
<sup>52</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

There were no differences between icon alternatives, which is consistent with the subjective comprehension results.<sup>53</sup>

### Objective comprehension: in product context

Objective comprehension was also assessed via a product identification task in which eight different washing machines were presented to respondents. Respondents had to select the washing machine(s) with either the shortest or longest programme duration. Table 4.10 shows the results. The percentage of respondents who identified the correct washing machine(s) was significantly higher when they were exposed to icon alternatives 1 (70.2%) and 2 (68.5%), as compared to alternative 3 (62.4%).<sup>54</sup>

**Table 4.10. Accurate product identification: programme duration**

Alternative 1 (N = 1016)	Alternative 2 (N = 1140)	Alternative 3 (N = 1097)	Total (N = 3253)
			
68.5% <sup>a</sup>	70.2% <sup>a</sup>	62.4% <sup>b</sup>	67.0%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 4.2.4. Noise level

#### Subjective comprehension: isolated icon

Table 4.11 shows the subjective (self-declared) comprehension results for the noise level icon. Overall, 84.8% of the respondents perceived the noise level icon as (very) clear. The relative performance of the various noise icon alternatives strongly depended on whether the icon's meaning was explained to respondents.<sup>55</sup> Self-reported understanding was immediately high for alternative 2 (87.1%), but significantly less so for alternatives 1 (82.4%) and 3 (81.5%). After the explanation, however, perceived clarity was equally high (circa 88.0%) for all icon alternatives.




<sup>53</sup> No differences between icon alternative:  $p = .307$ .

<sup>54</sup> Differences between icon alternatives:  $p < .001$ .

<sup>55</sup> Significant icon alternative x explanation interaction:  $p = .004$ .



**Table 4.11. Self-declared icon understanding<sup>56</sup>: noise level**




		Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
		 72dB	 72dB	 72dB	
<i>Total</i>	% (very) clear	84.8%	88.1%	83.5%	84.8%
	% (very) unclear	5.4%	3.6%	5.9%	5.0%
	Average (5-point)	4.3 <sup>ab</sup>	4.5 <sup>a</sup>	4.4 <sup>ab</sup>	4.4
<i>Before explanation</i>	% (very) clear	82.4%	87.1%	81.5%	83.6%
	% (very) unclear	6.8%	4.5%	7.6%	6.3%
	Average (5-point)	4.3 <sup>b</sup>	4.4 <sup>a</sup>	4.3 <sup>b</sup>	4.3
<i>After explanation</i>	% (very) clear	87.2%	89.1%	87.8%	88.0%
	% (very) unclear	4.0%	2.8%	4.2%	3.7%
	Average (5-point)	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

#### Objective comprehension: isolated icon

Objective comprehension of the separate icon, as assessed via a multiple choice quiz question, was also high. Table 4.12 shows that about 9 out of 10 respondents indicated the correct meaning of the noise level icon. There were no differences in objective comprehension between icon alternatives.<sup>57</sup>

**Table 4.12. Factual icon understanding: noise level**

	Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3 (N = 1069)	Total (N = 3303)
<i>What do you think this symbol indicates?</i>	 72dB	 72dB	 72dB	
<u>The noise level</u>	87.8% <sup>a</sup>	90.4% <sup>a</sup>	90.3% <sup>a</sup>	89.5%
The machine is connected to Wi-Fi and can be controlled and monitored using a smartphone	0.8%	1.0%	1.0%	0.9%
The machine has a silent mode	3.8%	3.4%	3.1%	3.4%
The vibrations produced by the machine	4.7%	3.3%	3.4%	3.8%
None of the answers is correct	0.3%	0.4%	0.2%	0.3%
I (really) don't know	2.5%	1.6%	2.1%	2.1%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .


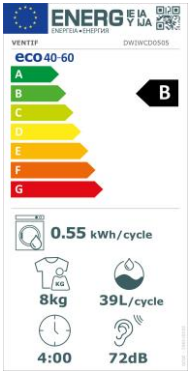
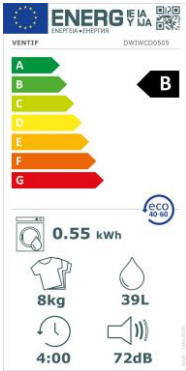
<sup>56</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

<sup>57</sup> No differences between icon alternatives:  $p = .307$ .

### Objective comprehension: in product context

Objective comprehension was also assessed in a product identification task, in which respondents were asked to identify either the most or least quiet washing machine(s) among a set of eight washing machines. Objective comprehension was significantly higher for icon alternative 1 (72.6%) and 2 (71.4%) compared to alternative 3 (52.3%, see Table 4.13).<sup>58</sup>

**Table 4.13. Accurate product identification: noise level**

Alternative 1 (N = 1016)	Alternative 2 (N = 1140)	Alternative 3 (N = 1097)	Total (N = 3253)
			
72.6% <sup>a</sup>	71.4% <sup>a</sup>	52.3% <sup>b</sup>	65.4%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### Preference regarding noise level

Respondents were also asked whether they preferred to have the noise level presented on the energy label in **decibels**, in **categories** (quiet, medium, noisy), or **both**. 47.0% of the respondents indicated to prefer information on the noise level in both decibels and categories, 24.2% preferred an indication in decibels, and 19.4% in categories. The remainder of the respondents (9.5%) did not have a clear preference.

### 4.2.5. Energy efficiency class and energy consumption

In the product identification task, respondents were also asked to identify the best or worst performing washing machine(s) in terms of energy performance. Table 4.14 shows the results. The analysis revealed that the percentage of respondents who identified the correct washing machine(s) depended on the specific label alternative when respondents were asked to identify the washing machine with either the best or worst energy efficiency class<sup>59</sup>, but not they were asked to identify the washing machine with either the highest or lowest energy consumption<sup>60</sup>. Label alternative 1 (78.9% correct) and 2 (76.7% correct) yielded a better understanding of the energy efficiency class, compared to label alternative 3 (69.4%), which is surprising because the energy efficiency scale and the way in which energy consumption information is provided did not differ between the label alternatives (see Table 4.14). Overall, and

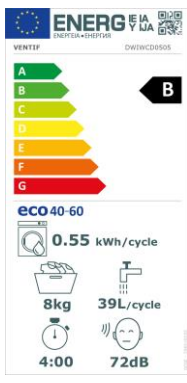
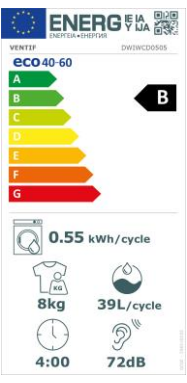

<sup>58</sup> Differences between icon alternatives:  $p < .001$ .

<sup>59</sup> Differences between icon alternatives:  $p < .001$ .

<sup>60</sup> No differences between label alternatives:  $p = .112$ .

consistent with the results for dishwashers, objective understanding of the energy efficiency class (74.9% correct) was substantially higher than understanding of the energy consumption (50.3%).

**Table 4.14. Accurate product identification: energy efficiency/consumption**

	Alternative 1 (N = 1099)	Alternative 2 (N = 1077)	Alternative 3 (N = 1129)	Total (N = 3305)
				
Energy efficiency class	78.9% <sup>a</sup>	76.7% <sup>a</sup>	69.4% <sup>b</sup>	74.9%
Energy consumption	49.0% <sup>a</sup>	49.1% <sup>a</sup>	52.7% <sup>a</sup>	50.3%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

#### 4.2.6. Understanding of other label information

In the next part of the questionnaire, respondents saw the energy label once more in its entirety and read a number of true/false statements, which aimed to assess understanding of other label aspects, namely (1) of the 'ECO 40-60' (or '40-60') programme as the tested (standard) programme, (2) that all information on the label pertains to this tested programme, (3) that information is provided per cycle (rather than per year). Table 4.15 shows the results. Whether consumers understood that all information on the label pertains to the 'ECO 40-60' (or '40-60') programme and that information is provided per cycle was tested with multiple true/false statements. The table shows the percentage of respondents who correctly responded to *all* statements measuring understanding of a certain information aspect (as a summary indicator), as well as the percentage correct per statement.<sup>61</sup>

#### Interpretation of the 'ECO 40-60'/'40-60' programme

Overall, only 2 out of 10 respondents correctly indicated that the programme indicated on the label<sup>62</sup> does *not* refer to a special programme that is available only in some washing machines (see Table 4.15). There were significant differences in the percentage of correct responses across the label alternatives. More specifically, label alternative 3B, which was the only label with '40-60' rather than 'ECO 40-60', outperformed all other label alternatives. Many consumers thus seem to associate the

<sup>61</sup> Note that these percentages may be high due to guessing (probability that a correct answer is provided based on guessing is 50% per statement).

<sup>62</sup> 'ECO 40-60' for respondents who saw either label alternative 1, 2 or 3A and just '40-60' for respondents who saw label alternative 3B.

word 'ECO' with a special programme that is available on some, but not all, washing machines.

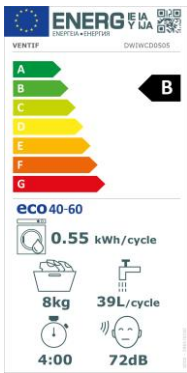
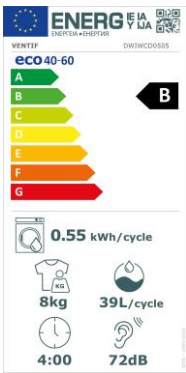

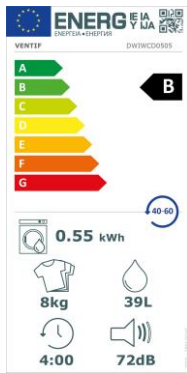
### Understanding that information pertains to the tested programmes

It was also assessed whether respondents understood that all information on the label pertains to the 'ECO 40-60' (for label alternatives 1, 2 and 3A) or '40-60' programme (for alternative 3B). About a third of the respondents responded correctly to all three true/false statements. This percentage was significantly higher for label alternative 1 (37.3%) as compared to the other label alternatives. Looking at the specific items, however, respondents who were exposed to label alternative 2 – in which the programme name is displayed at the top of the label – seemed to better understand that *all* information on the label pertains to the 'ECO 40-60' or '40-60' programme, and not just the information at the bottom part of the label (Table 4.15).

### Understanding that information is provided per cycle

Label alternative 1 (47.9% correct) best seems to communicate that the energy and water consumption are displayed per cycle (rather than per year), followed by label alternative 2 (45.6%), 3B (44.2%), and 3A (37.0%). This seems to be driven by the difference in the manner in which a 'cycle' is represented on the label, in words (label alternatives 1 and 2) versus graphically (alternatives 3A and 3B).

**Table 4.15. Understanding of other label information: true/false questions**

Alternative 1	Alternative 2	Alternative 3A	Alternative 3B			
						
% of respondents who gave the <u>correct</u> answer (true/false)		Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3A (N = 562)	Alternative 3B (N = 507)	Total (N = 3303)
<i>Interpretation of '40-60 programme'</i>		<b>17.8%<sup>b</sup></b>	<b>19.1%<sup>b</sup></b>	<b>15.3%<sup>b</sup></b>	<b>32.2%<sup>a</sup></b>	<b>20.0%</b>
1. This washing machine has a special 40-60 programme, only available in some washing machines, which uses less energy and water than other programmes (false). <sup>63</sup>		17.8% <sup>b</sup>	19.1% <sup>b</sup>	15.3% <sup>b</sup>	32.2% <sup>a</sup>	20.0%

<sup>63</sup> Differences between label alternatives:  $p < .001$

**Table 4.15. (continued)**

% of respondents who gave the <u>correct</u> answer (true/false)	Alternative 1 (N = 1162)	Alternative 2 (N = 1072)	Alternative 3A (N = 562)	Alternative 3B (N = 507)	Total (N = 3303)
<i>Understanding that the information pertains to the tested programme (% all statements correct)</i> <sup>64</sup>	<b>37.3%<sup>a</sup></b>	<b>29.9%<sup>b</sup></b>	<b>29.5%<sup>b</sup></b>	<b>30.0%<sup>b</sup></b>	<b>32.4%</b>
2. The top part of the label pertains to the average energy consumption and the bottom part to the 40-60 programme (false). <sup>65</sup>	19.6% <sup>c</sup>	35.2% <sup>a</sup>	23.7% <sup>b</sup>	25.4% <sup>b</sup>	26.3%
3. All information on the label pertains to the 40-60 programme (true). <sup>66</sup>	58.0% <sup>b</sup>	62.5% <sup>ab</sup>	52.0% <sup>c</sup>	53.3% <sup>bc</sup>	57.7%
4. The label displays the energy efficiency, energy consumption and water consumption of the washing machine when the 40-60 programme is being used (true). <sup>67</sup>	75.0% <sup>a</sup>	75.1% <sup>a</sup>	72.2% <sup>ab</sup>	70.6% <sup>b</sup>	73.9%
<i>Understanding that information is provided per cycle (% all statements correct)</i> <sup>68</sup>	<b>47.9%<sup>a</sup></b>	<b>45.6%<sup>ab</sup></b>	<b>37.0%<sup>c</sup></b>	<b>40.8%<sup>bc</sup></b>	<b>44.2%</b>
5. The water consumption of this washing machine is 39 litres <u>per wash cycle</u> when the 40-60 programme is being used (true). <sup>69</sup>	82.5% <sup>a</sup>	83.6% <sup>a</sup>	81.1% <sup>a</sup>	80.3% <sup>a</sup>	82.3%
6. The energy consumption of this washing machine is 0.55 kWh <u>per year</u> when the 40-60 programme is being used (false). <sup>70</sup>	55.5% <sup>a</sup>	51.7% <sup>ab</sup>	44.1% <sup>c</sup>	49.1% <sup>bc</sup>	51.4%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

### 4.3. Perceived relevance and missing of information

Respondents were asked how important information on the water consumption, load capacity, programme duration, and noise level, would be to them when comparing washing machines and how important it would be for them that this information is displayed on the energy label. Results are presented in Table 4.16. Overall, the majority of the respondents indicated that they found the features, and receiving

<sup>64</sup> Marginally significant differences between label alternatives:  $p = .064$ .

<sup>65</sup> Differences between label alternatives:  $p < .001$ .

<sup>66</sup> Differences between label alternatives:  $p < .001$ .

<sup>67</sup> No differences between label alternatives:  $p = .157$ .

<sup>68</sup> Differences between label alternatives:  $p < .001$ .

<sup>69</sup> No differences between label alternatives:  $p = .467$ .

<sup>70</sup> Differences between label alternatives:  $p < .001$ .

information on them via the label, very or extremely important. Information on the load capacity and water consumption of washing machines was seen as most relevant.

**Table 4.16. Perceived relevance of information**

	% not at all important / not very important	% very important / extremely important	Average (5-point)
How important would information about .... be to you when comparing washing machines?			
water consumption	4.5%	67.7%	3.9
load capacity	3.8%	70.0%	3.9
programme duration	11.8%	50.9%	3.5
noise level	10.2%	57.5%	3.7
How important would it be to you that this information is displayed on the energy label?			
water consumption	5.3%	69.0%	3.9
load capacity	6.0%	69.9%	3.9
programme duration	13.0%	52.8%	3.6
noise level	9.5%	60.4%	3.7

Note – N = 3290.

We also asked respondents whether they missed important information on the tested label. 92.5% of the respondents reported that they did not miss any information.

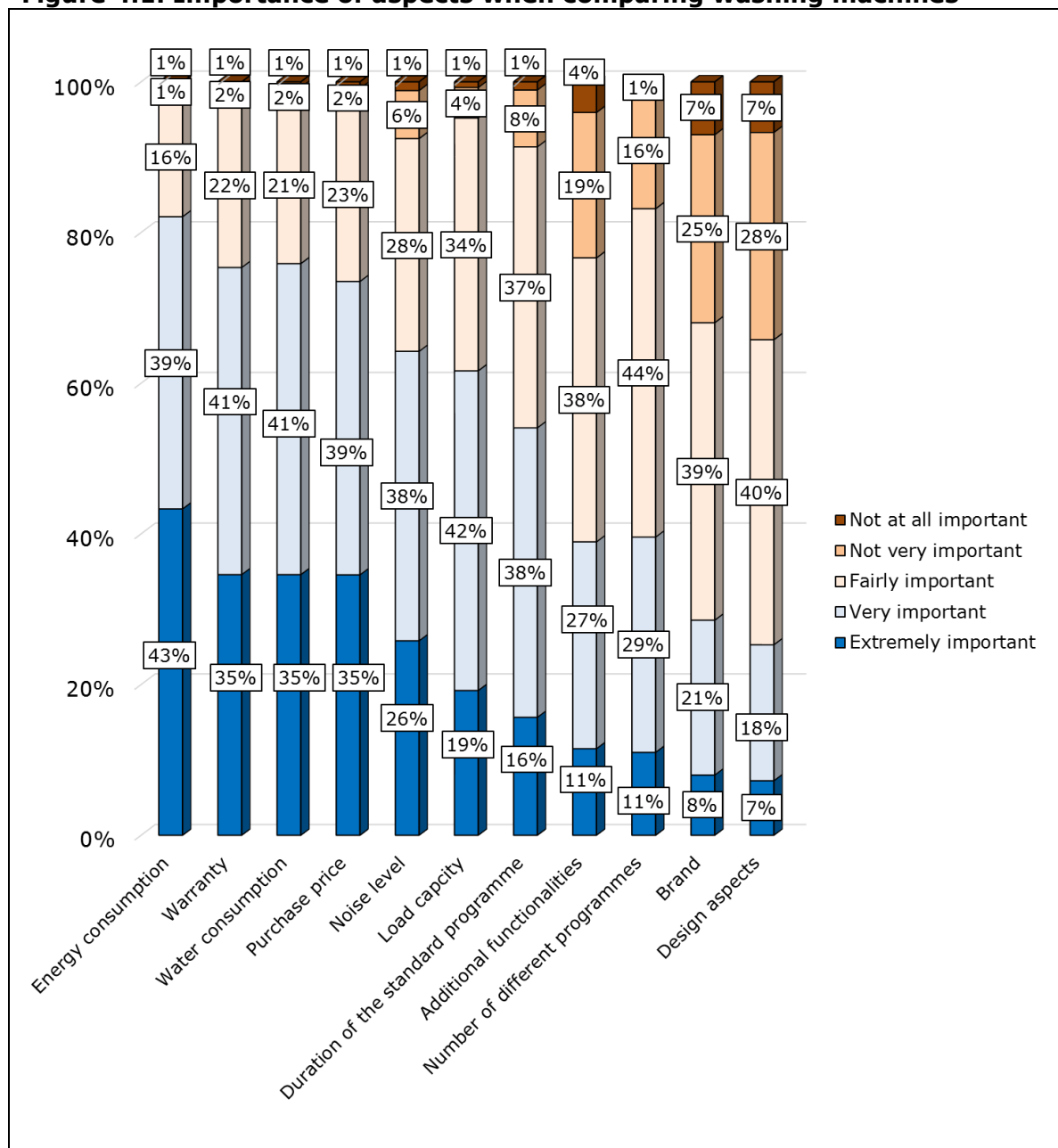
In the final part of the questionnaire, we asked respondents how important they would consider different aspects when comparing different washing machines (see Figure 4.1).<sup>71</sup> From the four features for which comprehension was tested in this study, namely water consumption, load capacity, programme duration and noise level, the water consumption is considered (very or extremely) important by most respondents (75.5%) and the programme duration by least respondents (52.1%).

#### 4.4. Product choice

After the product identification task (used to measure objective comprehension in product context), respondents were also asked which washing machines they would buy if they would have to make a choice among the presented washing machines. The choice shares per washing machine are presented in Table 4.17. In this hypothetical purchase situation, most respondents opted for the washing machines of the (fictive) brands VAE (€949; 30.8%) and Heassda (€729; 32.2%), which were most durable and most energy efficient, but were also relatively expensive.


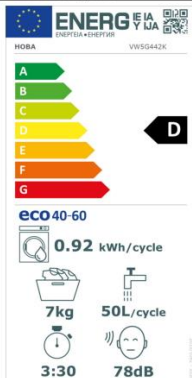

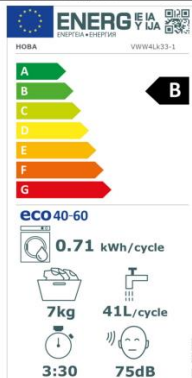

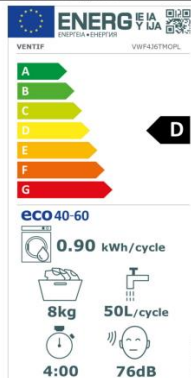

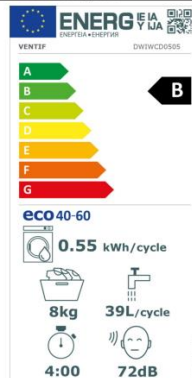

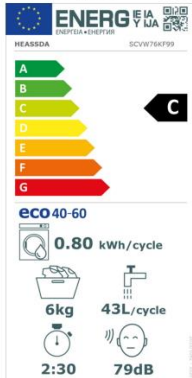

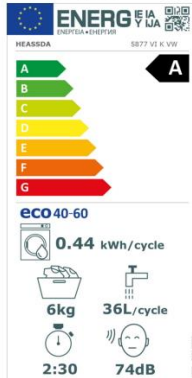

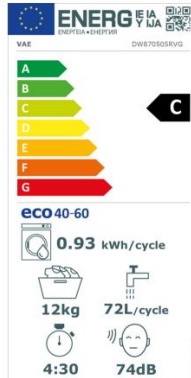

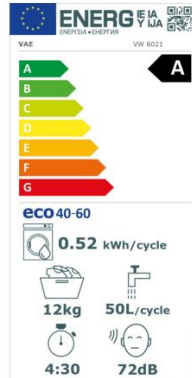
<sup>71</sup> Note that this question was asked in the fifth and last part of the survey. The focus on energy performance and related aspects in the previous parts may have increased the perceived importance of these aspects in this part of the questionnaire.

**Figure 4.1. Importance of aspects when comparing washing machines**





**Table 4.17. Choice shares per washing machine<sup>72</sup>**

% of respondents who selected the specific washing machine			
 <p><b>Hoba</b> € 269</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1400 Aantal programma's: 7 Startuitlet: nee Automatische dosering: nee</p>  <p>3.9%</p>	 <p><b>Hoba</b> € 475</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1400 Aantal programma's: 7 Startuitlet: nee Automatische dosering: nee</p>  <p>11.3%</p>	 <p><b>Ventif</b> € 495</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1400 Aantal programma's: 9 Startuitlet: ja Automatische dosering: nee</p>  <p>2.6%</p>	 <p><b>Ventif</b> € 719</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 9 Startuitlet: ja Automatische dosering: nee</p>  <p>6.8%</p>
 <p><b>Heassda</b> € 525</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 7 Startuitlet: ja Automatische dosering: nee</p>  <p>2.5%</p>	 <p><b>Heassda</b> € 729</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 7 Startuitlet: ja Automatische dosering: nee</p>  <p>32.2%</p>	 <p><b>VAE</b> € 739</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 15 Startuitlet: ja Automatische dosering: ja</p>  <p>2.4%</p>	 <p><b>VAE</b> € 949</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 15 Startuitlet: ja Automatische dosering: ja</p>  <p>30.8%</p>

<sup>72</sup> 7.8% of the respondents indicated that they did not know which product they would prefer.



## 5. Findings: washer-dryers

### 5.1. Tested programme

In the first part of the questionnaire, respondents were asked to imagine a new washer-dryer that featured a range of different programmes. They were informed that one of the programmes that the washer-dryer offered was a programme for (normally soiled) cotton laundry that is washable at 40°C or 60°C according to the garment label. The programme was briefly described (“The programme cleans this laundry simultaneously in the same wash cycle, and dries it until it is so-called ‘cupboard dry’”) and respondents were informed that, in the near future, manufacturers will be obliged to offer this programme on their washer-dryers. We then asked (1) which name, according to the respondent, would fit this programme best, (2) at which temperature they thought their laundry would be washed if they would run this programme, and (3) whether they would use this programme for their daily laundry.

The largest group of respondents (29.8%) considered the “Wash and dry programme” the best name for the programme (see Table 5.1). The majority of respondents incorrectly – but perhaps not surprisingly – assumed that, if they would run this programme, their laundry would be washed at a temperature between 40°C and 60°C (70.1%, Table 5.1). 79.3% of the respondents indicated that they were likely to use this programme, and 12.8% indicated that they were not likely to use it (the remaining 1.6% indicated that they don’t do the laundry themselves).

**Table 5.1. Name fit and programme interpretation**













	Percentage (N = 3296)
<i>According to you, which name fits this programme best?</i>	
The “Wash and dry programme”	29.8%
The “40-60 and dry programme”	23.0%
The “Standard 40-60 and dry programme”	20.8%
The “ECO 40-60 and dry programme”	24.7%
Other	1.7%
<i>At which temperature do you think the laundry will be washed during the wash cycle?</i>	
Higher than 60°C	3.3%
Between 40°C and 60°C	70.1%
At 40°C	21.8%
Lower than 40°C	4.9%

### 5.2. Comprehension

Box 5.1 provides a summary of the comprehension results. The results are described in more detail in the following paragraphs, in which we examine differences in subjective (for isolated icons) and objective comprehension (for isolated icons and in product context) between icon alternatives. For a detailed description on how comprehension was measured, see sections 2.1 and 3.1.

**Box 5.1. Washer-dryers: summary of results**

The table below presents the overall results per icon, combining the findings related to subjective and objective comprehension. Relatively well performing icon alternatives are shaded green, and relatively poor performing alternatives are shaded red (icon alternatives shaded yellow perform well on some comprehension measures, but not on others).

Best (green) versus worst (red) performing icons			
Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 <b>39L</b>	 <b>39L</b>	 <b>39L</b>
Maximum load	 <b>8kg</b>	 <b>8kg</b>	 <b>8kg</b>
Programme duration	 <b>4:00</b>	 <b>4:00</b>	 <b>4:00</b>
Noise level	 <b>72dB</b>	 <b>72dB</b>	 <b>72dB</b>

**5.2.1. Water consumption****Subjective comprehension: isolated icon**




Table 5.2 provides the self-declared comprehension results for the water consumption icon. Overall, about 8 out of 10 respondents indicated that the icon was clear or very clear. Subjective understanding significantly depended on the specific icon alternative presented to the respondent.<sup>73</sup> On average, it was highest for icon alternative 1, which was considered (very) clear by 83.0% of the respondents, followed by alternatives 3 (79.0%) and 2 (76.0%). Not surprisingly, subjective understanding significantly improved when the meaning of the icon was explained to respondents.<sup>74</sup> Before the explanation, 75.0% indicated that the icon was (very) clear, 83.9% did so after the explanation. The relative performance of the icon alternatives did not significantly depend on whether or not their meaning was explained, however.<sup>75</sup> Thus, alternative 1 outperformed the other two alternatives both before and after the explanation.

<sup>73</sup> Differences between icon alternatives:  $p < .001$ .

<sup>74</sup> Explanation effect:  $p < .001$ .




<sup>75</sup> No significant icon alternative x explanation interaction:  $p = .055$ .

**Table 5.2. Self-declared icon understanding<sup>76</sup>: water consumption**

		Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
		 39L	 39L	 39L	
<i>Total</i>	% (very) clear	83.0%	76.0%	79.0%	79.4%
	% (very) unclear	5.1%	8.5%	8.0%	7.1%
	Average (5-point)	4.3 <sup>a</sup>	4.1 <sup>b</sup>	4.2 <sup>b</sup>	4.2
<i>Before explanation</i>	% (very) clear	79.1%	70.7%	74.8%	75.0%
	% (very) unclear	6.3%	10.5%	9.8%	8.9%
	Average (5-point)	4.2 <sup>a</sup>	4.0 <sup>c</sup>	4.1 <sup>b</sup>	4.1
<i>After explanation</i>	% (very) clear	86.8%	81.3%	83.2%	83.9%
	% (very) unclear	3.9%	6.5%	6.2%	5.5%
	Average (5-point)	4.5 <sup>a</sup>	4.3 <sup>b</sup>	4.3 <sup>b</sup>	4.3

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

**Table 5.3. Factual icon understanding: water consumption**

	Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
<i>What do you think this symbol indicates?</i>	 39L	 39L	 39L	
The volume of the drum	3.8%	8.6%	7.7%	6.6%
<u>The water consumption of one wash cycle</u>	90.5% <sup>a</sup>	82.8% <sup>b</sup>	84.1% <sup>b</sup>	85.9%
The machine determines automatically how much detergent is needed (auto-dosing system)	2.2%	2.6%	2.8%	2.5%
The machine has an intensive cleaning programme	0.5%	0.5%	0.7%	0.6%
None of the answers is correct	0.7%	0.3%	1.2%	0.7%
I (really) don't know	2.3%	5.3%	3.4%	3.6%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### Objective comprehension: isolated icon

Next, we examined whether consumers actually understood the meaning of the water consumption icon via a multiple choice quiz question (Table 5.3). 85.9% of the respondents provided the correct answer ("The water consumption of one cycle"). Objective (i.e. factual) comprehension significantly differed between icon




<sup>76</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.

alternatives.<sup>77</sup> Consistent with the subjective comprehension results, objective comprehension was higher for alternative 1 (90.5%) as compared to alternatives 2 (82.8%) and 3 (84.1%).

### Objective comprehension: in product context

In the product identification task, respondents were presented with a small assortment of washer-dryers and were asked to identify the washer-dryer(s) with either the highest or the lowest water consumption (separate respondent groups). Respondents were explicitly instructed to look at the information on the complete wash and dry cycle.<sup>78</sup> Table 4.4 shows the results, averaged across the two groups. In total, about a quarter of the respondents identified the correct washer-dryer(s). The proportion of respondents who selected the correct washer-dryer(s) from the product set significantly differed across the icon alternatives.<sup>79</sup> Accurate identification of products based on the water consumption icon was significantly higher for icon alternatives 1 (29.6% correct) and 2 (29.1%), as compared to icon alternative 3 (24.5%).

**Table 5.4. Accurate product identification: water consumption**

Alternative 1 (N = 1079)	Alternative 2 (N = 1130)	Alternative 3 (N = 1084)	Total (N = 3293)
			
29.6% <sup>a</sup>	29.1% <sup>a</sup>	24.5% <sup>b</sup>	27.7%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 5.2.2. Load capacity

#### Subjective comprehension: isolated icon

Table 5.5 shows the level of (self-declared) understanding of the load capacity icon per icon alternative. In total, about 9 out of 10 respondents indicated that the icon




<sup>77</sup> Differences between icon alternatives:  $p < .001$ .

<sup>78</sup> "The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying."

<sup>79</sup> Differences between icon alternatives:  $p = .009$ .




was (very) clear. The perceived clarity of the icon was independent of the specific alternative that was presented to the respondent.<sup>80</sup>

**Table 5.5. Self-declared icon understanding<sup>81</sup>: load capacity**

		Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
		 8kg	 8kg	 8kg	
<i>Total</i>	% (very) clear	89.1%	88.4%	89.1%	88.9%
	% (very) unclear	3.1%	2.7%	2.9%	2.9%
	Average (5-point)	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5
<i>Before explanation</i>	% (very) clear	88.8%	89.1%	88.7%	88.9%
	% (very) unclear	4.0%	2.4%	3.3%	3.2%
	Average (5-point)	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5
<i>After explanation</i>	% (very) clear	89.4%	87.6%	89.4%	88.8%
	% (very) unclear	2.3%	2.9%	2.6%	2.6%
	Average (5-point)	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5 <sup>a</sup>	4.5

*Note* – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

**Table 5.6. Factual icon understanding: load capacity**

	Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
<i>What do you think this symbol indicates?</i>	 8kg	 8kg	 8kg	
The weight of the machine	2.8%	2.0%	2.7%	2.5%
The machine senses the load and adjusts the programme accordingly (automatic load detection)	4.2%	3.6%	4.5%	4.1%
The number of garments that the machine can wash and dry (load capacity)	20.2%	22.2%	22.3%	21.5%
<u>The maximum weight of the (dry) laundry that the machine can both wash and dry in one cycle (load capacity)</u>	70.6% <sup>a</sup>	69.9% <sup>a</sup>	68.5% <sup>a</sup>	69.7%
None of the answers is correct	0.9%	1.0%	1.3%	1.0%
I (really) don't know	1.4%	1.4%	0.7%	1.2%

*Note* – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

<sup>80</sup> No differences between icon alternatives:  $p = .744$ ; no explanation effect:  $p = .700$ ; no significant icon alternative x explanation interaction:  $p = .368$ .

<sup>81</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) *very unclear* to (5) *very clear*.




### Objective comprehension: isolated icon

The multiple choice comprehension question, which measured factual comprehension, was answered correctly by about 7 out of 10 respondents (see Table 5.6). Consistent with the subjective comprehension results, there were no differences in the level of understanding between the icon alternatives.<sup>82</sup>

### Objective comprehension: in product context

In the product identification task, respondents were exposed to eight washer-dryers with product descriptions and full energy labels, and instructed to select the washer-dryer(s) with either the highest or lowest load capacity. About 7 out of 10 respondents selected the correct product(s). The proportion did not significantly differ across icon alternatives (see Table 5.7).<sup>83</sup>

**Table 5.7. Accurate product identification: load capacity**

Alternative 1 (N = 1044)	Alternative 2 (N = 1120)	Alternative 3 (N = 1137)	Total (N = 3301)
			
68.5% <sup>a</sup>	69.6% <sup>a</sup>	68.7% <sup>a</sup>	69.0%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 5.2.3. Programme duration




About two third of the respondents considered the icon that represented the duration of the tested programme to be (very) clear (65.6%, see Table 5.8). Self-declared understanding of this icon did not differ across icon alternatives (see Table 5.8)<sup>84</sup>, neither before nor after respondents were informed about the meaning of the icon.

<sup>82</sup> No differences between icon alternatives:  $p = .538$ .

<sup>83</sup> No differences between icon alternatives:  $p = .822$ .

<sup>84</sup> No differences between icon alternatives:  $p = .899$ .

**Table 5.8. Self-declared icon understanding<sup>85</sup>: programme duration**




		Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
		 4:00	 4:00	 4:00	
Total	% (very) clear	66.0%	65.0%	65.8%	65.6%
	% (very) unclear	15.7%	15.6%	15.4%	15.6%
	Average (5-point)	3.9 <sup>a</sup>	3.8 <sup>a</sup>	3.8 <sup>a</sup>	3.8
Before explanation	% (very) clear	64.5%	63.9%	64.7%	64.4%
	% (very) unclear	15.6%	15.0%	14.4%	15.0%
	Average (5-point)	3.8 <sup>a</sup>	3.8 <sup>a</sup>	3.8 <sup>a</sup>	3.8
After explanation	% (very) clear	67.5%	66.1%	67.0%	66.9%
	% (very) unclear	15.8%	16.3%	16.5%	16.2%
	Average (5-point)	3.9 <sup>a</sup>	3.8 <sup>a</sup>	3.8 <sup>a</sup>	3.9

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

#### Objective comprehension: isolated icon

Table 5.9 presents the results of the objective (multiple choice) comprehension question. 56.7% of the respondents selected the correct answer ("The duration of the tested programme loaded at full capacity"). Differences in factual icon understanding between the icon alternatives were not significant (see Table 5.9).<sup>86</sup>

**Table 5.9. Factual icon understanding: programme duration**

	Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
What do you think this symbol indicates?	 4:00	 4:00	 4:00	
The availability of a timer function to delay the start of the programme to a later time (delay start)	26.2%	23.8%	25.8%	25.3%
The durability of the machine	2.6%	2.1%	2.7%	2.5%
<u>The duration of the tested programme loaded at full capacity</u>	55.8% <sup>a</sup>	57.5% <sup>a</sup>	57.0% <sup>a</sup>	56.7%
The machine has a digital clock	4.8%	5.0%	4.0%	4.6%
None of the answers is correct	1.7%	2.0%	2.3%	2.0%
I (really) don't know	8.9%	9.6%	8.3%	8.9%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

<sup>85</sup> "Do you think this symbol is clear or unclear?" measured on a 5-point scale from (1) very unclear to (5) very clear.




<sup>86</sup> No differences between icon alternatives:  $p = .748$ .



### Objective comprehension: in product context

In contrast to the results of the isolated testing of the icon alternatives, there were significant differences in objective comprehension between the icon alternatives when the information was presented in a product context (see Table 5.10).<sup>87</sup> More specifically, respondents were better able to identify the washer-dryer with the shortest or longest tested programme (depending on what was asked for) when they were exposed to alternative 3 (48.2% correct) as compared to alternatives 1 (42.6%) and 2 (43.0%).

**Table 5.10. Accurate product identification: programme duration**

Alternative 1 (N = 1044)	Alternative 2 (N = 1120)	Alternative 3 (N = 1137)	Total (N = 3301)
			
42.6% <sup>b</sup>	43.0% <sup>b</sup>	48.2% <sup>a</sup>	44.7%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### 5.2.4. Noise level

#### Subjective comprehension

Self-declared understanding of the noise level icon was relatively high. In total, about 9 out of 10 respondents considered the icon clear or very clear (87.3%). The perceived clarity of the icon differed between icon alternatives.<sup>88</sup> More specifically, alternative 2 was perceived as slightly more clear (89.2%) as compared to alternatives 1 (85.9%) and 3 (87.1%). Furthermore, perceived clarity improved after the meaning of the icon was explained to respondents, from 85.2% to 89.3%.<sup>89</sup> However, the relative performance of the three icon alternatives was the same before and after the explanation.<sup>90</sup>

<sup>87</sup> Differences between icon alternatives:  $p = .006$ .




<sup>88</sup> Differences between icon alternatives:  $p = .008$ .

<sup>89</sup> Explanation effect:  $p < .001$ .

<sup>90</sup> No significant icon alternative x explanation interaction:  $p = .117$ .



**Table 5.11. Self-declared icon understanding<sup>91</sup>: noise level**




		Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
		 72dB	 72dB	 72dB	
<i>Total</i>	% (very) clear	85.9%	89.2%	87.1%	87.3%
	% (very) unclear	5.6%	2.9%	4.9%	4.5%
	Average (5-point)	4.4 <sup>b</sup>	4.5 <sup>a</sup>	4.4 <sup>b</sup>	4.4
<i>Before explanation</i>	% (very) clear	83.5%	87.5%	84.8%	85.2%
	% (very) unclear	7.3%	3.5%	6.3%	5.8%
	Average (5-point)	4.3 <sup>b</sup>	4.5 <sup>a</sup>	4.4 <sup>b</sup>	4.4
<i>After explanation</i>	% (very) clear	87.9%	90.9%	89.4%	89.3%
	% (very) unclear	3.9%	2.3%	3.4%	3.2%
	Average (5-point)	4.5 <sup>b</sup>	4.6 <sup>a</sup>	4.5 <sup>ab</sup>	4.5

Note – Averages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

#### Objective comprehension: isolated icon

Factual understanding of the noise level icon was high. In total, 90.2% of the respondents identified the accurate answer (“The noise level”) in the multiple choice question (see Table 5.12). This did not differ across icon alternatives.<sup>92</sup>

**Table 5.12. Factual icon understanding: noise level**

	Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3 (N = 1075)	Total (N = 3270)
<i>What do you think this symbol indicates?</i>	 72dB	 72dB	 72dB	
<u>The noise level</u>	89.8% <sup>a</sup>	91.3% <sup>a</sup>	89.7% <sup>a</sup>	90.2%
The machine is connected to Wi-Fi and can be controlled and monitored using a smartphone	1.2%	1.0%	1.5%	1.2%
The machine has a silent mode	3.1%	3.3%	2.3%	2.9%
The vibrations produced by the machine	3.3%	2.1%	4.0%	3.2%
None of the answers is correct	0.6%	0.4%	0.3%	0.4%
I (really) don't know	1.9%	2.0%	2.2%	2.1%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .




<sup>91</sup> “Do you think this symbol is clear or unclear?” measured on a 5-point scale from (1) very unclear to (5) very clear.

<sup>92</sup> No differences between icon alternatives:  $p = .421$ .

### Objective comprehension: in product context

In the product identification task, in which respondents were exposed to a set of washer-dryers with energy labels and other product information, about half of the respondents accurately identified either the most quiet or most noisy washer-dryer (depending on what was asked for, see Table 5.13). Consistent with the results for the isolated noise level icon, there were no differences in objective comprehension across the various icon alternatives.<sup>93</sup>

**Table 5.13. Accurate product identification: noise level**

Alternative 1 (N = 1044)	Alternative 2 (N = 1120)	Alternative 3 (N = 1137)	Total (N = 3301)
			
49.4% <sup>a</sup>	48.3% <sup>a</sup>	50.6% <sup>a</sup>	49.4%

Note – Percentages with different superscripts indicate statistically significant differences at  $p < .05$ .

### Preference regarding noise level

Respondents were also asked whether they preferred to have the noise level presented on the energy label in **decibels**, in **categories** (quiet, medium, noisy), or **both**. 44.1% of the respondents indicated to prefer information on the noise level in both decibels and categories, 28.1% preferred an indication in decibels, and 19.3% in categories. The remainder of the respondents (8.5%) did not have a clear preference.




### 5.2.5. Energy efficiency class and energy consumption

In the product identification task, respondents were also asked to identify the best or worst performing washer-dryer(s) in terms of energy performance. Table 5.14 shows that the percentage of respondent who identified the correct washer-dryer (s) did not depend on the specific label alternative.<sup>94</sup> This is not surprising given that the energy efficiency scale and the way in which energy consumption information is provided did not differ between the label alternatives. Consistent with the results for dishwashers and washing machines, objective understanding of the energy efficiency class (74.9% correct) was again substantially higher than understanding of the energy consumption (30.2%).

<sup>93</sup> No differences between icon alternatives:  $p = .352$ .

<sup>94</sup> No differences between label alternatives:  $p = .112$  (energy efficiency class) and  $p = .655$  (energy consumption).

**Table 5.14. Accurate product identification: energy efficiency/consumption**

	Alternative 1 (N = 1100)	Alternative 2 (N = 1082)	Alternative 3 (N = 1082)	Total (N = 3264)
				
Energy efficiency class	70.0% <sup>a</sup>	73.7% <sup>a</sup>	69.5% <sup>a</sup>	71.7%
Energy consumption	29.0% <sup>a</sup>	30.8% <sup>a</sup>	30.7% <sup>a</sup>	30.2%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

### 5.2.6. Understanding of other label information

In the fourth part of the questionnaire, respondents received a number of true/false statements which aimed to test consumer understanding of other label information, namely (1) whether they accurately interpreted the 'ECO 40-60' (or '40-60') programme, (2) whether they understood that the 'ECO 40-60' (or '40-60') programme was the tested programme, (3) whether they understood that the left part of the label pertains to a wash and dry cycle and the right part to a wash cycle, and (4) whether they understood that the information is provided per cycle (rather than per year). The findings are presented in Table 5.15. Understanding of each 'type' of information was assessed via multiple true/false statements. The table shows the percentage of respondents who correctly responded to *all* statements measuring understanding of a certain information aspect (as a summary indicator), as well as the percentage correct for each individual statement.<sup>95</sup>

#### Interpretation of the 'ECO 40-60'/'40-60' programme

About 9 in 10 respondents thought the 'ECO 40-60' or '40-60' programme is a *special* programme only available in some washer-dryers, which uses less energy and water than other programmes. This proportion was significantly lower (about 8 in 10) for alternative 3B, which was the only label with '40-60' rather than 'ECO 40-60' as compared to the other label alternatives (see Table 5.15). Thus, many consumers seem to assume that ECO refers to a special programme, not available on all washer-dryers.

#### Understanding that information pertains to the tested programmes

The extent to which respondents understood that all information on the label pertains to the tested programmes indicated on the label ('wash and dry' and 'ECO 40-60'/'40-60') was assessed via four true/false statements. About 10% of the respondents

responded correctly to all four statements, showing accurate understanding. Understanding was significantly higher for label alternative 2 – with the programme name displayed at the top of the label, above the energy efficiency scale – as compared to label alternatives 1 and 3A, with label alternative 3B falling in between.

### Understanding that the left part pertains to a wash and dry cycle and the right part pertains to a wash cycle

Respondents read three true/false statements relating to the information displayed on the left (wash and dry) versus right (washing-only) part of the label. Alternatives 1 and 2 aim to make this clear via two separate icons, one representing the wash and dry cycle (with a water drop and heat waves) and one representing the wash cycle (with a water drop only, see Table 5.15). In contrast, alternatives 3A and 3B use an 'integrated' icon in which the two types of cycles are displayed in a single washer-dryer icon (left and right). Looking at the individual statements (statements 2 and 2, see Table 5.15), a higher proportion of respondents accurately indicated that the left part of the label pertained to a wash and dry cycle rather than a drying-only cycle when the separate icons were shown (in alternatives 1 and 2) as compared to the integrated icon (alternatives 3A and 3B). However, respondents who were exposed to alternative 3A and 3B in turn seemed to better understand that the information on the right side of the label pertains to a washing-only cycle. Overall, understanding was higher for alternative 3B (almost 40% responded correctly to *all three* statements) than for all other alternatives (about 30%, see Table 5.15).

### Understanding that information is provided per cycle

Overall, there were no differences between the label alternatives in the extent to which respondents understood that the information on the label is provided per cycle (rather than per year).

**Table 5.15. Understanding of other label information: true/false questions**

Alternative 1	Alternative 2	Alternative 3A	Alternative 3B

<sup>95</sup> Note that these percentages may be high due to guessing (probability that a correct answer is provided based on guessing is 50% per statement).

**Table 5.15. (continued)**

% of respondents who gave the <u>correct</u> answer (true/false)	Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3A (N = 530)	Alternative 3B (N = 545)	Total (N = 3270)
<i>Interpretation of 'ECO 40-60'/'40-60' programme</i>	<b>10.0%<sup>b</sup></b>	<b>9.3%<sup>b</sup></b>	<b>10.6%<sup>b</sup></b>	<b>19.1%<sup>a</sup></b>	<b>11.4%</b>
1. This washer-dryer has a special 40-60 programme, only available in some washer-dryers, which uses less energy and water than other programmes (false). <sup>96</sup>	10.0% <sup>b</sup>	9.3% <sup>b</sup>	10.6% <sup>b</sup>	19.1% <sup>a</sup>	11.4%
<i>Understanding that the information pertains to the tested programmes (% all statements correct)<sup>97</sup></i>	<b>8.8%<sup>b</sup></b>	<b>11.6%<sup>a</sup></b>	<b>8.3%<sup>b</sup></b>	<b>9.2%<sup>ab</sup></b>	<b>9.7%</b>
2. The top part of the label pertains to the average energy consumption and the bottom part to the wash and dry programme (false). <sup>98</sup>	27.3% <sup>b</sup>	34.2% <sup>a</sup>	24.9% <sup>b</sup>	27.2% <sup>b</sup>	29.1%
3. All information on the label pertains to the wash and dry programme (false) <sup>99</sup>	31.6% <sup>b</sup>	34.2% <sup>ab</sup>	33.2% <sup>ab</sup>	38.0% <sup>a</sup>	33.8%
4. The left side of the label displays the energy efficiency, energy consumption and water consumption of the washer-dryer when the wash and dry programme is being used (true). <sup>100</sup>	73.7% <sup>a</sup>	74.4% <sup>a</sup>	72.8% <sup>a</sup>	71.6% <sup>a</sup>	73.4%
5. The right side of the label displays the energy efficiency, energy consumption and water consumption of the wash cycle of the washer-dryer when the ECO 40-60/40-60 programme is being used (true). <sup>101</sup>	77.7% <sup>a</sup>	76.4% <sup>a</sup>	71.5% <sup>b</sup>	67.9% <sup>b</sup>	74.7%
<i>Understanding that the left part pertains to a wash and dry cycle and the right part pertains to a wash cycle<sup>102</sup></i>	<b>30.7%<sup>b</sup></b>	<b>29.9%<sup>b</sup></b>	<b>29.1%<sup>b</sup></b>	<b>39.8%<sup>a</sup></b>	<b>31.7%</b>
6. The information on the right side of the label pertains to a wash cycle (so washing-only) (true). <sup>103</sup>	50.7% <sup>c</sup>	48.1% <sup>c</sup>	55.7% <sup>b</sup>	64.8% <sup>a</sup>	53.0%
7. The information on the left side of the label pertains to a dry cycle (so drying-only) (false). <sup>104</sup>	69.1% <sup>a</sup>	69.4% <sup>a</sup>	58.7% <sup>b</sup>	62.9% <sup>b</sup>	66.5%
8. The information on the left side of the label pertains to a complete wash and dry cycle (true). <sup>105</sup>	74.4% <sup>b</sup>	77.6% <sup>a</sup>	68.9% <sup>c</sup>	70.1% <sup>bc</sup>	73.8%

<sup>96</sup> Differences between label alternatives:  $p < .001$ <sup>97</sup> Marginally significant differences between label alternatives:  $p = .064$ .<sup>98</sup> Differences between label alternatives:  $p < .001$ .<sup>99</sup> No differences between label alternatives:  $p = .119$ .<sup>100</sup> No differences between label alternatives:  $p = .611$ .<sup>101</sup> Differences between label alternatives:  $p < .001$ .<sup>102</sup> Differences between label alternatives:  $p < .001$ .<sup>103</sup> Differences between label alternatives:  $p < .001$ .<sup>104</sup> Differences between label alternatives:  $p < .001$ .

**Table 5.15. (continued)**

% of respondents who gave the <u>correct</u> answer (true/false)	Alternative 1 (N = 1155)	Alternative 2 (N = 1040)	Alternative 3A (N = 530)	Alternative 3B (N = 545)	Total (N = 3270)
<i>Understanding that information is provided per cycle (% all statements correct)<sup>106</sup></i>	<b>13.4%<sup>a</sup></b>	<b>13.3%<sup>a</sup></b>	<b>11.3%<sup>a</sup></b>	<b>14.7%<sup>a</sup></b>	<b>13.2%</b>
9. The water consumption of this washer-dryer is 80 litres <u>per wash and dry cycle</u> when the wash and dry programme is being used (true). <sup>107</sup>	78.6% <sup>a</sup>	77.0% <sup>a</sup>	72.8% <sup>b</sup>	75.1% <sup>ab</sup>	76.6%
10. The energy consumption of this washer-dryer is 4.69 kWh <u>per year</u> when the wash and dry programme is being used (false). <sup>108</sup>	55.6% <sup>a</sup>	56.8% <sup>a</sup>	46.2% <sup>b</sup>	50.8% <sup>b</sup>	53.7%
11. The energy consumption of the washer-dryer is 4.69 kWh <u>per wash cycle</u> when the ECO 40-60/40-60 programme is being used (true). <sup>109</sup>	37.1% <sup>a</sup>	33.9% <sup>a</sup>	35.5% <sup>a</sup>	38.4% <sup>a</sup>	36.0%

Note – Percentages with different superscripts (in rows) indicate statistically significant differences at  $p < .05$ .

### 5.3. Perceived relevance and missing of information

In the questionnaire, it was explained to respondents that the energy label for the washer-dryer displays the energy efficiency of a complete wash (left side) and dry cycle as well as the energy efficiency of a wash cycle (right side). Respondents were then asked whether they, if they were looking for a washer-dryer, would find it useful that the energy label displays this information for both the wash and dry cycle as well as for the wash cycle only. About three-quarters of the respondents indicated to find it useful that this information is displayed on a single label (76.6%), 6.5% would prefer a label that only displays this information for the complete wash and dry cycle, and 2.9% would prefer a label that only displays this information for the wash cycle. 13.3% of the respondents would prefer two separate labels.

For the features of interest – water consumption, load capacity, programme duration, and noise level, we asked respondents how important information about the feature would be to them when comparing washer-dryers and how important it would be for them that the information is displayed on the energy label. Results are presented in Table 5.16. Overall, the majority of the respondents indicated that they found these features, and receiving information on them via the label, very or extremely important. Information on the water consumption and load capacity of washer-dryers was seen as most relevant.

<sup>105</sup> Differences between label alternatives:  $p < .001$ .

<sup>106</sup> No differences between label alternatives:  $p < .450$ .

<sup>107</sup> Marginally significant differences between label alternatives:  $p = .056$ .

<sup>108</sup> Differences between label alternatives:  $p < .001$ .

<sup>109</sup> No differences between label alternatives:  $p = .280$ .

**Table 5.16. Perceived relevance of information**

	% not at all important / not very important	% very important / extremely important	Average (5-point)
How important would information about .... be to you when comparing washer-dryers?			
water consumption	5.0%	68.4%	3.9
load capacity	4.6%	69.2%	3.9
programme duration	10.9%	54.1%	3.6
noise level	9.6%	57.8%	3.7
How important would it be to you that this information is displayed on the energy label?			
water consumption	5.3%	71.0%	4.0
load capacity	5.7%	69.5%	3.9
programme duration	12.0%	56.5%	3.6
noise level	9.7%	61.4%	3.8

Note – N = 3270.

We also asked respondents whether they missed important information on the tested label. 94.5% of the respondents reported that they did not miss any information.

In the final part of the questionnaire, we asked respondents how important they would consider different aspects when comparing different washer-dryers (see Figure 5.1).<sup>110</sup> Looking at the four features (water consumption, load capacity, programme duration and noise level) for which comprehension was tested in this study, the water consumption is considered (very or extremely) important by most respondents (74.3%) and the programme duration by least respondents (72.4%).

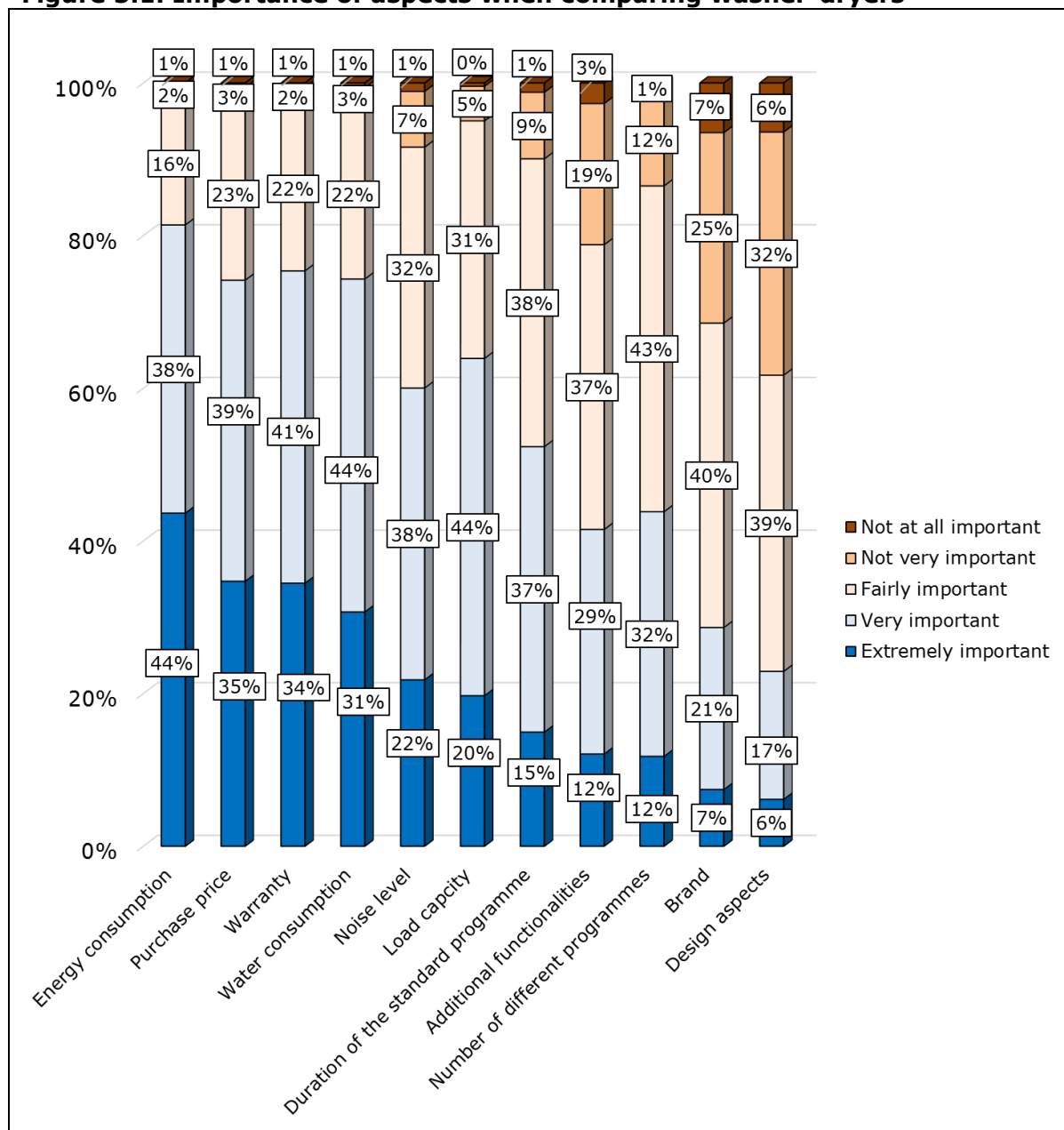
#### 5.4. Product choice

In the product identification task, respondents were exposed to a set of eight washer-dryers and asked to identify washer-dryers with a specific feature as a measure of objective comprehension. After the product identification questions, respondents were also asked which washer-dryer they would buy if they would have to make a choice among the presented washer-dryers. The choice shares per washer-dryer are presented in Table 5.17. In this hypothetical purchase situation, most respondents opted for the washer-dryer of the (fictive) brands VAE (€1178) and Heassda (€969), which were most durable and most energy efficient, but were also relatively expensive.

<sup>110</sup> Note that this question was asked in the fifth and last part of the survey. The focus on energy performance and related aspects in the previous parts may have increased the perceived importance of these aspects in this part of the questionnaire.



















**Figure 5.1. Importance of aspects when comparing washer-dryers**





**Table 5.17. Choice shares per washer-dryer<sup>111</sup>**

% of respondents who selected the specific dishwasher			
 <p><b>Hoba</b> € 429</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1400 Aantal programma's: 7 Startuitlet: nee Automatische dosering: nee Anti-kreuk: nee</p>  <p>4.0%</p>	 <p><b>Hoba</b> € 555</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1400 Aantal programma's: 7 Startuitlet: nee Automatische dosering: nee Anti-kreuk: nee</p>  <p>11.8%</p>	 <p><b>Ventif</b> € 598</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1400 Aantal programma's: 9 Startuitlet: ja Automatische dosering: nee Anti-kreuk: nee</p>  <p>3.2%</p>	 <p><b>Ventif</b> € 899</p> <p>Minimum levensduur (in jaren): 7 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 9 Startuitlet: ja Automatische dosering: nee Anti-kreuk: ja</p>  <p>7.3%</p>
 <p><b>Heassda</b> € 599</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 7 Startuitlet: ja Automatische dosering: nee Anti-kreuk: nee</p>  <p>2.5%</p>	 <p><b>Heassda</b> € 969</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 7 Startuitlet: ja Automatische dosering: nee Anti-kreuk: ja</p>  <p>26.4%</p>	 <p><b>VAE</b> € 999</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 12 Startuitlet: ja Automatische dosering: ja Anti-kreuk: ja</p>  <p>2.9%</p>	 <p><b>VAE</b> € 1178</p> <p>Minimum levensduur (in jaren): 12 Maximum centrifugesnelheid (in tpm): 1600 Aantal programma's: 12 Startuitlet: ja Automatische dosering: ja Anti-kreuk: ja</p>  <p>33.1%</p>

<sup>111</sup> 8.9% of the respondents indicated that they did not know which product they would prefer.

## 6. Conclusion and recommendations

The objective of this study was to inform the design of a revised energy label for household washing machines, household washer-dryers and household dishwashers. This study tested consumer understanding of newly developed icons representing the water consumption, load capacity, programme duration, and noise level of the appliance, as well as the extent to which consumers perceived these features as relevant. For each feature, three icon alternatives were developed and tested. In addition, we tested understanding of other information presented on the label, such as the indication of the tested programme. The next sections summarise the results of the study. In section 6.1, we discuss the perceived relevance of the product features of interest. Section 6.2 provides a summary of the overall comprehension results, as well as the results per product group. Finally, section 6.3 provides an overview of the comprehension results related to other label information.

### 6.1. Perceived relevance of the features

For each of the features of interest in this study (i.e. water consumption, load capacity, programme duration and noise level), Table 6.1 provides an overview of the percentage of respondents who found it (very or extremely) important that the information is displayed on the energy label. For all features and all product groups, the majority of respondents considered it important that the energy label displays this information. For dishwashers, most respondents considered information on the water consumption relevant to include on the label (71.5%, see Table 6.1). For washing machines and washer-dryers, water consumption (69.0% and 71.0%, respectively) as well as load capacity (69.9% and 69.5%, respectively) were perceived as most important to include on the label.

**Table 6.1. Perceived importance**

	% of respondents who find it important that the feature is displayed on the energy label		
	Dishwashers	Washing machines	Washer-dryers
Water consumption	71.5%	69.0%	71.0%
Load capacity	58.7%	69.9%	69.5%
Programme duration	66.5%	52.8%	56.5%
Noise level	63.4%	60.4%	61.4%

### 6.2. Comprehension of the icons

Table 6.2 and 6.3 provide an overview of the comprehension results across all product types. A distinction is made between **subjective comprehension** (i.e. does the consumer *think* s/he understands the meaning of the icon, does s/he perceive the icon as being clear?) and **objective comprehension** (i.e. does the consumer *actually* understand the meaning of the icon?). Objective comprehension was assessed for icons presented **in isolation** (multiple choice quiz question) as well as for icons embedded in full labels in the **context of a (small) product assortment** (product identification task).

For the icons representing water consumption and noise level, the results revealed a clear gap between subjective and objective comprehension. While a large majority of respondents indicated that they understood, or thought they understood, the meaning of the icons (typically in the range of 75% to 90%), at most about two-third of the respondents correctly identified the appliance(s) that they were supposed to find in the product identification tasks. It seems that many respondents had difficulty actually searching for and comparing the right information. However, this gap was particularly large for the washer-dryers, which may be explained by the fact that this label displays double information. Respondents may have looked at the wrong part of the label in the product identification task, explaining their relatively poor performance.

**Table 6.2. Best (green) vs. worst (red) performing icons: all product groups**
















Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 <b>39L</b>	 <b>39L</b>	 <b>39L</b>
Number of place settings (dishwashers)	 <b>12X</b>	 <b>12X</b>	 <b>12X</b>
Maximum load (washing machines and washer-dryers)	 <b>8kg</b>	 <b>8kg</b>	 <b>8kg</b>
Programme duration	 <b>4:00</b>	 <b>4:00</b>	 <b>4:00</b>
Noise level	 <b>72dB</b>	 <b>72dB</b>	 <b>72dB</b>

Table 6.2 and 6.3 provide an overview of the best performing icon alternatives. Table 6.3 shows the comprehension results separately for subjective comprehension (icons in isolation) and objective comprehension (icons in isolation and in product context), and Table 6.2 shows the integrated findings. For the water consumption icon, icon alternative 1 clearly outperformed the other two icon alternatives (see Table 6.2). For the icons representing maximum load (for washing machines and washer-dryers) and the duration of the tested programme, all icon alternatives performed more or less equally well. For the maximum load icon, there were no differences across the alternatives on any of the comprehension measures. For the programme duration icon, the results were less clear-cut. Icon alternatives 1 and 2 performed better in terms of subjective comprehension (perceived clarity), whereas alternative 3

performed better in terms of objective comprehension (i.e. ability to identify the correct product among a small product assortment; see Table 6.2). Overall, alternative 2 of the icon representing the number of place settings best communicated its intended meaning. However, icon alternatives 1 and 3 performed at least equally well on specific comprehension aspects (see Table 6.2). Finally, and similarly, alternative 2 of the noise level icon performed best overall, and clearly outperformed alternative 3 on all aspects. Icon alternative 1 yielded better product identification in a product context, but only for washing machines.

**Table 6.3. Best performing icons: subjective vs. objective comprehension**

	Subjective comprehension (icons in isolation)	Objective comprehension	
		Icons in isolation	Icons in product context
Water consumption	Alternative 1 (all products)	Alternative 1 (all products)	Alternative 1 + 2
Number of place settings (dishwashers)	Alternative 2	Alternative 3	Alternative 1 + 2
Maximum load (washing machines and washer-dryers)	No differences	No differences	No differences
Programme duration	Alternative 2 + 3	No differences	Alternative 1
Noise level	Alternative 2 (all products)	No differences	Alternative 1

### Comprehension results per product group

This section provides a summary of the comprehension results per product group.













Table 6.4, 6.6 and 6.8 summarise the subjective comprehension results for dishwashers, washing machines and washer-dryers, respectively. Subjective comprehension was measured by asking whether respondents thought the icon was clear or unclear (immediate understanding). Subsequently, the meaning of the icon was explained to respondents, after which the perceived clarity of the icon was assessed once more ("Now you know its meaning, do you think the icon is clear or unclear?"). Icon alternatives that were immediately clear – i.e. at least 80% of respondents reported to find the alternative clear or very clear – are shaded yellow in Table 6.4. Icon alternatives that reached this 80% benchmark after the explanation was provided are shaded green.

Furthermore, the blue border around an icon indicates that the specific icon alternative is perceived as most clear relative to the other icon alternatives representing the feature. If multiple icon alternatives have a blue border (row-wise), there were no differences in the perceived clarity of these alternatives.

Table 6.5, 6.7 and 6.9 summarise the results on objective comprehension for dishwashers, washing machines, and washer-dryers, respectively, which was assessed














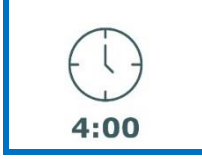






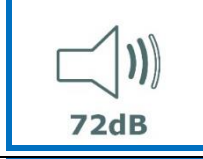


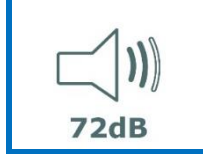
for icons presented in isolation (multiple choice quiz question) as well as for icons embedded in full labels in the context of a small assortment of eight dishwashers (product identification task). The blue border around an icon alternative indicates that the alternative outperforms other alternatives that represent the same feature. If multiple icon alternatives have a blue border (row-wise), there were no differences in the actual understanding of these alternatives.

**Table 6.4. Dishwashers: subjective comprehension**

Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 39L	 39L	 39L
Number of place settings	 12X	 12X	 12X
Programme duration	 4:00	 4:00	 4:00
Noise level	 72dB	 72dB	 72dB













*Note* – Icon alternatives shaded yellow are immediately understood (self-declared) by at least 80% of the respondents. Icon alternatives shaded green are perceived as clear by at least 80% of the respondent after explanation of the icon. Icon alternatives with a blue border outperform other alternatives for the same feature.

**Table 6.5. Dishwashers: objective comprehension**

Icons		Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	Isolated icon			
	Icon in product context			
Number of place settings	Isolated icon			
	Icon in product context			
Programme duration	Isolated icon			
	Icon in product context			
Noise level	Isolated icon			
	Icon in product context			













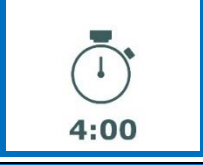
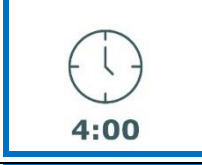
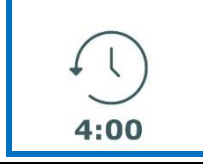

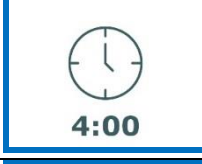



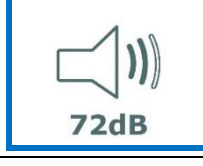



Note – Icon alternatives with a blue border outperform other alternatives for the same feature.

**Table 6.6. Washing machines: subjective comprehension**

Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 <b>39L</b>	 <b>39L</b>	 <b>39L</b>
Maximum load	 <b>8kg</b>	 <b>8kg</b>	 <b>8kg</b>
Programme duration	 <b>4:00</b>	 <b>4:00</b>	 <b>4:00</b>
Noise level	 <b>72dB</b>	 <b>72dB</b>	 <b>72dB</b>

*Note* – Icon alternatives shaded yellow are immediately understood (self-declared) by at least 80% of the respondents. Icon alternatives shaded green are perceived as clear by at least 80% of the respondent after explanation of the icon. Icon alternatives with a blue border outperform other alternatives for the same feature.













**Table 6.7. Washing machines: objective comprehension**

Icons		Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	Isolated icon			
	Icon in product context			
Maximum load	Isolated icon			
	Icon in product context			
Programme duration	Isolated icon			
	Icon in product context			
Noise level	Isolated icon			
	Icon in product context			

Note – Icon alternatives with a blue border outperform other alternatives for the same feature.














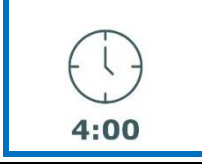
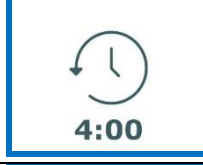

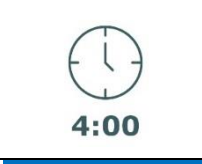
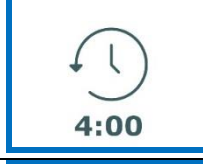








**Table 6.8. Washer-dryers: subjective comprehension**

Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 39L	 39L	 39L
Maximum load	 8kg	 8kg	 8kg
Programme duration	 4:00	 4:00	 4:00
Noise level	 72dB	 72dB	 72dB

*Note* – Icon alternatives shaded yellow are immediately understood (self-declared) by at least 80% of the respondents. Icon alternatives shaded green are perceived as clear by at least 80% of the respondent after explanation of the icon. Icon alternatives with a blue border outperform other alternatives for the same feature.

**Table 6.9. Washer-dryers: objective comprehension**

Icons		Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	Isolated icon			
	Icon in product context			
Maximum load	Isolated icon			
	Icon in product context			
Programme duration	Isolated icon			
	Icon in product context			
Noise level	Isolated icon			
	Icon in product context			

Note – Icon alternatives with a blue border outperform other alternatives for the same feature.

### 6.3. Comprehension of other label information

In order to test whether respondents also understood other information on the label, such as the indication of the tested programme and the information per cycle (rather than per year), respondents were exposed to one of the full labels (see Table 6.10-6.12) and responded to a number of true/false statements. Understanding of those aspects is quite low, in general, with the percentage of respondents who responded

correctly to *all* statements related to a specific label aspect (e.g. understanding that the information is provided per cycle) ranging between 8.8% and 47.9%.

**Table 6.10. Label alternatives: dishwashers**

Label alternative 1	Label alternative 2	Label alternative 3

**Table 6.11. Label alternatives: washing machines**

Label alternative 1	Label alternative 2	Label alternative 3A	Label alternative 3B

**Table 6.12. Label alternatives: washer-dryers**

Label alternative 1	Label alternative 2	Label alternative 3A	Label alternative 3B

Some label aspects contributed to (somewhat) higher levels of understanding:

- Label alternative 2 (see Table 6.10-6.12) with the tested programme indicated at the top of the label (above the energy efficiency scale) seemed to communicate more clearly that all information on the label pertains to the tested programme, as compared to other label alternatives.
- Label alternative 1 and 2 – where ‘cycle’ was indicated in words – seemed to communicate more clearly that the energy and water consumption are displayed per cycle compared to label variant 3 – where ‘cycle’ was represented graphically.

The washer-dryer label was more complex than the labels for the other two product groups as it contained information on both the complete wash and dry cycle as well as the wash cycle only. The results of the product identification task, which revealed relatively poor product identification for washer-dryers, seem to confirm this. To further explore whether the double information on the label has a detrimental effect on consumer understanding, we examined whether consumers were less able to identify the product with the best (or worst) energy performance when they were exposed to washer-dryer labels as compared to washing machine labels.<sup>112</sup> Accurate identification of the product with the highest (or lowest) energy consumption was lower among respondents who saw washer-dryers (30.2%; Table 5.14) than among respondents who saw washing machines (50.3%; Table 4.14). It thus seems that a substantial group of respondents looked at the wrong part of the washer-dryer label. Nonetheless, a vast majority of respondents (76.6%) reported to prefer a single label

<sup>112</sup> Respondents who were exposed to washer-dryers were explicitly instructed to look at the information on the complete wash and dry cycle (“The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying.”)

that displays both information on the complete wash and dry cycle and the wash only cycle.

Finally, we examined which representation of the washer-dryer functions facilitated understanding of the 'wash and dry' and 'wash-only' parts of the label: separate icons (see label alternatives 1 and 2 in Table 6.12) or an integrated icon (see alternatives 3A and 3B in Table 6.12). A higher proportion of respondents accurately indicated that the left part of the label pertained to a wash and dry cycle rather than a drying-only cycle when the separate icons were shown (in alternatives 1 and 2) as compared to the integrated icon (alternatives 3A and 3B). However, respondents who were exposed to alternative 3A and 3B in turn seemed to better understand that the information on the right side of the label pertains to a washing-only cycle. Overall, understanding was slightly higher for alternative 3B than for all other alternatives.

## Annex. Questionnaire

### Energy labels for dishwashers, washing machines and washer-dryers: Questionnaire

#### GENERAL INTRODUCTION

##### *Screen 1 [General introduction]*

*All respondents:*

Thank you for taking part in this important study for the European Commission.

When you purchase a domestic appliance, like a washing machine, dishwasher, refrigerator, vacuum cleaner or television, you have a wide choice and an enormous amount of information to compare. To facilitate a quick and easy comparison of models in terms of energy efficiency and other relevant criteria such as durability, many domestic appliances that are sold in the European Union carry an EU energy label. This energy label is compulsory in all EU countries.

This questionnaire is about the EU energy label. It consists of three parts and takes about 15 minutes to complete.

##### *Screen 2*

This questionnaire is about the energy label for white goods, such as washing machines and dishwashers. To remain in step with developments and continue to provide information that consumers find useful, this label will soon be updated.

*For scripter:*

<i>Value of X1</i>	<i>Product type</i>	<i>Number of respondents per country</i>
<i>1</i>	<i>Dishwashers</i>	<i>450</i>
<i>2</i>	<i>Washing machines</i>	<i>450</i>
<i>3</i>	<i>Washer-dryers</i>	<i>450</i>

*Scripter: Respondents are **randomly assigned** to the levels of **X1**.*

#### **PART 1. TESTED PROGRAMME**

##### *Screen 3*

*If X1 = 1 (dishwashers), then skip this screen.*

*If X1 = 2 (washing machines), then:*

But first, imagine a new washing machine that features a range of different wash programmes. The machine offers programmes for cotton laundry (at various temperatures), synthetic and mixed laundry (at 40°C), and delicates (at 20°C or 30°C), as well as special programmes such as an easy iron programme or an anti-allergy programme.

*If X1 = 3 (washer-dryers), then:*

But first, imagine a new washer-dryer that features a range of different wash programmes. For the wash cycle, the machine offers programmes for cotton laundry (at various temperatures), synthetic and mixed laundry (at 40°C), and delicates (at 20°C or 30°C), as well as special programmes such as an easy iron programme or an anti-allergy programme. The machine also offers programmes for the drying process and programmes combining washing and drying.

##### *Screen 4*

*If X1 = 1 (dishwashers), then skip this screen.*

*If X1 = 2 (washing machines), then:*

One of the programmes that the washing machine offers is a programme for (normally soiled) cotton laundry that is washable at 40°C or 60°C according to the garment label. The programme cleans this laundry simultaneously in the same wash cycle. In the near future, manufacturers of washing machines will be obliged to offer this programme on their washing machines.

**Q1.** According to you, which name fits this programme best?

- 1 The "40-60" programme
- 2 The "ECO 40-60" programme
- 3 The "Standard 40-60" programme
- 4 Other, namely...

**Q2.** Imagine that you would run this programme and load the drum fully. At which temperature do you think your laundry will be washed then?

- 1 higher than 60°C
- 2 between 40°C and 60°C
- 3 at 40°C
- 4 lower than 40°C

**Q3.** Would you use this programme for your daily laundry?

- 1 Definitely
- 2 I think so
- 3 I think not
- 4 Definitely not
- 5 I (really) don't know
- 6 I don't do the laundry

*If X1 = 3 (washer-dryers), then:*

One of the programmes that the washer-dryer offers is a programme for (normally soiled) cotton laundry that is washable at 40°C or 60°C according to the garment label. The programme cleans this laundry simultaneously in the same wash cycle, and dries it until it is so-called 'cupboard dry' (i.e. dry enough to be stored directly in your cupboard). In the near future, manufacturers of washer-dryers will be obliged to offer this programme on their washer-dryers.

**Q1.** According to you, which name fits this programme best?

- 1 The "Wash and dry" programme
- 2 The "40-60 and dry" programme
- 3 The "Standard 40-60 and dry" programme
- 4 The "ECO 40-60 and dry" programme
- 5 Other, namely...

**Q2.** Imagine that you would run this programme. At which temperature do you think your laundry will be washed during the wash cycle?

- 1 higher than 60°C
- 2 between 40°C and 60°C
- 3 at 40°C
- 4 lower than 40°C

**Q3.** Would you use this programme for your daily laundry?

- 1 Definitely

- 2 I think so  
 3 I think not  
 4 Definitely not  
 5 I (really) don't know  
 6 I don't do the laundry

For scripter:

Value of X2	Order	Number of respondents per country
1	First Part 1, then Part 2	675
2	First Part 2, then Part 1	675
Value of X3	Label configuration	Number of respondents per country
1	Variant 1	450
2	Variant 2	450
3	Variant 3	450
Value of X4 (nested in X3)	Label configuration (subtypes)	Number of respondents per country
1	Variant 3A	225
2	Variant 3B	225
Value of X5	Question order	Number of respondents per country
1	Order 1	675
2	Order 2	675
Value of X6	Choice questions	Number of respondents per country
1	Group 1	675
2	Group 2	675

Scripter: Respondents are **randomly assigned** to the levels of **X2**, **X3**, **X5** and **X6**.

Respondents assigned to **X3 = 3** (variant 3) are randomly assigned to the levels of **X4**.

Each respondent will be exposed to all product types (all values of **X1**). The order depends on the value of **X7** as follows:

Value of X7	Product order			Number of respondents per country
	Part 1A	Part 1B	Part 2&3	
1	Dishwashers (X1 = 1)	Washing machines (X1 = 2)	Washer-dryers (X1 = 3)	450
2	Washing machines (X1 = 2)	Washer-dryers (X1 = 3)	Dishwashers (X1 = 1)	450
3	Washer-dryers (X1 = 3)	Dishwashers (X1 = 1)	Washing machines (X1 = 2)	450

If X2 = 1, then first show PART 1 (CHOICE), and then PART 2 (COMPREHENSION).

If X2 = 2, then first show PART 2 (COMPREHENSION), and then PART 1 (CHOICE).

If X7 = 1, then X1 = 1 (PART 1A), X1 = 2 (PART 1B), X1 = 3 (PART 2).

If X7 = 2, then X1 = 2 (PART 1A), X1 = 3 (PART 1B), X1 = 1 (PART 2).



If  $X7 = 3$ , then  $X1 = 3$  (PART 1A),  $X1 = 1$  (PART 1B),  $X1 = 2$  (PART 2).

## **PART 2. PRODUCT IDENTIFICATION AND CHOICE TASKS**

### **PART 2A.**

Screen 5 [Introduction choice task 1A]

If  $X2 = 2$ :

This is the second part of the questionnaire.

If  $X2 = 1$ , then skip this text.

All respondents:

Now, imagine that you visit a store to buy a [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer]. On the next screen, you will see eight [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] that are available in the store. Each [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] carries an energy label.

We will ask you to find a [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] with a specific feature. It is possible that there are multiple [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] with that feature. If you can't find the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] you are looking for, you can select the option "I (really) don't know" at the bottom.

If you can't read the information on the energy label, you can zoom in by simultaneously pressing the "Ctrl" and "+" buttons. (After you have completed the task, you can zoom out again by simultaneously pressing the "Ctrl" and "-" buttons.)

Screen 6-9 [Choice task 1A]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "SET1\_P1\_V1.jpg" until "SET1\_P8\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "SET1\_P1\_V2.jpg" until "SET1\_P8\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "SET1\_P1\_V3.jpg" until "SET1\_P8\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "SET2\_P1\_V1.jpg" until "SET2\_P8\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "SET2\_P1\_V2.jpg" until "SET2\_P8\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 1$ , then display "SET2\_P1\_V3A.jpg" until "SET2\_P8\_V3A.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 2$ , then display "SET2\_P1\_V3B.jpg" until "SET2\_P8\_V3B.jpg"


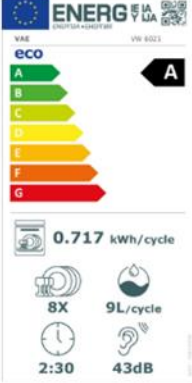

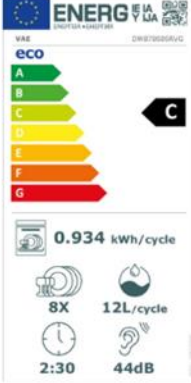

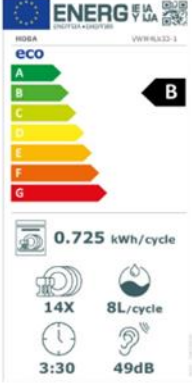

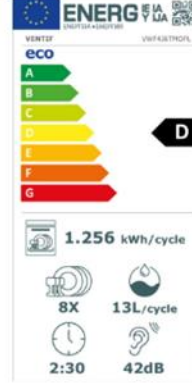

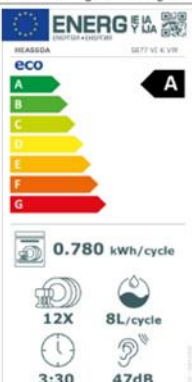

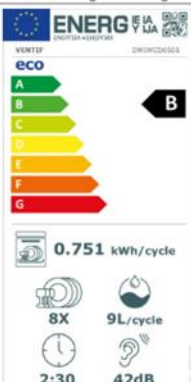

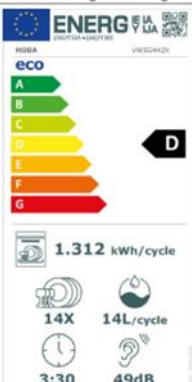

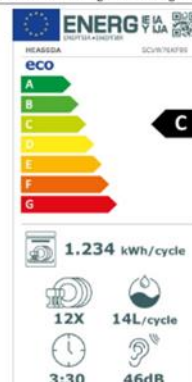
If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "SET3\_P1\_V1.jpg" until "SET3\_P8\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "SET3\_P1\_V2.jpg" until "SET3\_P8\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 1$ , then display "SET3\_P1\_V3A.jpg" until "SET3\_P8\_V3A.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 2$ , then display "SET3\_P1\_V3B.jpg" until "SET3\_P8\_V3B.jpg"

Example of graphical representation product set (note that this is the old energy label):

 <p><b>VAE</b> € 1092 Minimum levensduur (in jaren): 11 Aantal programma's: 10 Startuitlet: ja Automatische beladingsherkenning: ja</p> 	 <p><b>VAE</b> € 999 Minimum levensduur (in jaren): 11 Aantal programma's: 10 Startuitlet: ja Automatische beladingsherkenning: ja</p> 	 <p><b>HOBBA</b> € 496 Minimum levensduur (in jaren): 7 Aantal programma's: 5 Startuitlet: nee Automatische beladingsherkenning: nee</p> 	 <p><b>Ventif</b> € 574 Minimum levensduur (in jaren): 7 Aantal programma's: 7 Startuitlet: ja Automatische beladingsherkenning: nee</p> 
 <p><b>Heassda</b> € 949 Minimum levensduur (in jaren): 11 Aantal programma's: 5 Startuitlet: ja Automatische beladingsherkenning: nee</p> 	 <p><b>Ventif</b> € 899 Minimum levensduur (in jaren): 7 Aantal programma's: 7 Startuitlet: ja Automatische beladingsherkenning: nee</p> 	 <p><b>HOBBA</b> € 306 Minimum levensduur (in jaren): 7 Aantal programma's: 5 Startuitlet: nee Automatische beladingsherkenning: nee</p> 	 <p><b>Heassda</b> € 591 Minimum levensduur (in jaren): 11 Aantal programma's: 5 Startuitlet: ja Automatische beladingsherkenning: nee</p> 

Scripter: please randomize order of products within the product set.

If  $X_5 = 1$ :

If  $X_1 = 3$ , then The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying.

Scripter: Please leave this text on the screen for Q4-Q6.

If  $X_1 < 3$ , then skip this text.

**Q4.** Which of these [if  $X_1 = 1$ , then dishwashers; if  $X_1 = 2$ , then washing machines; if  $X_1 = 3$ , then washer-dryers] has [if  $X_6 = 1$ , then the best; if  $X_6 = 2$ , then the worst] energy efficiency class? Multiple answers possible.

Scripter: Please record the time spent on the screen and store this in the data.

**Q5.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] uses [if  $X6 = 1$ , then the largest; if  $X6 = 2$ , then the smallest] amount of energy? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

**Q6.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] uses [if  $X6 = 1$ , then the smallest; if  $X6 = 2$ , then the largest] amount of water? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

*Scripter: randomize Q4 t/m Q6 (and store display order in data set), Q7 is always the last question.*

*Scripter: Respondents should be able to select one or more products from the choice set OR response option "I (really) don't know".*

**Q7.** If you would have to make a choice among these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers], which one would you buy?

*Scripter: Please record the time spent on the screen and store this in the data.*

*Scripter: Respondents should be able to select one product from the choice set OR response option "I (really) don't know".*

*If  $X5 = 2$ :*

*If  $X1 = 3$ , then The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying.*

*Scripter: Please leave this text on the screen for Q4-Q6.*

*If  $X1 < 3$ , then skip this text.*

**Q4.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] has [if  $X6 = 1$ , then the largest; if  $X6 = 2$ , then the smallest] load capacity\*? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

*If  $X1 = 1$ : \* The load capacity of a dishwasher is expressed as the maximum number of standard place settings (i.e. crockery, glass and cutlery for use by one person) that the machine can clean and dry.*

*If  $X1 = 2$ : \* The load capacity of a washing machine is expressed as the maximum weight of the (dry) laundry that the machine can wash.*

*If  $X1 = 3$ : \* The load capacity of a washer-dryer is expressed as the maximum weight of the (dry) laundry that the machine can both wash and dry in a complete cycle.*

**Q5.** Which machine's (tested) programme takes [if  $X6 = 1$ , then the shortest; if  $X6 = 2$ , then the longest] amount of time? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

**Q6.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] is [if  $X6 = 1$ , then the least; if  $X6 = 2$ , then the most] quiet? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

Scripter: randomize Q4 t/m Q6 (and store display order in data set), Q7 is always the last question.

Scripter: Respondents should be able to select one or more products from the choice set OR response option "I (really) don't know".

**Q7.** If you would have to make a choice among these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers], which one would you buy?

Scripter: Please record the time spent on the screen and store this in the data.

Scripter: Respondents should be able to select one product from the choice set OR response option "I (really) don't know".

## **END OF PART 2A.**

### **PART 2B.**

Screen 10 [Introduction choice task 1B]

Now, imagine that you visit a store to buy a [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer]. On the next screen, you will see eight [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] that are available in the store. Each [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] carries an energy label.

We will ask you to find a [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] with a specific feature. It is possible that there are multiple [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] with that feature. If you can't find the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] you are looking for, you can select the option "I (really) don't know" at the bottom.

Screen 11-14 [Choice task 1B]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "SET1\_P1\_V1.jpg" until "SET1\_P8\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "SET1\_P1\_V2.jpg" until "SET1\_P8\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "SET1\_P1\_V3.jpg" until "SET1\_P8\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "SET2\_P1\_V1.jpg" until "SET2\_P8\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "SET2\_P1\_V2.jpg" until "SET2\_P8\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 1$ , then display "SET2\_P1\_V3A.jpg" until "SET2\_P8\_V3A.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 2$ , then display "SET2\_P1\_V3B.jpg" until "SET2\_P8\_V3B.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "SET3\_P1\_V1.jpg" until "SET3\_P8\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "SET3\_P1\_V2.jpg" until "SET3\_P8\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 1$ , then display "SET3\_P1\_V3A.jpg" until "SET3\_P8\_V3A.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 2$ , then display "SET3\_P1\_V3B.jpg" until "SET3\_P8\_V3B.jpg"

Scripter: please randomize order of products within the product set.

If  $X5 = 2$ :

If  $X1 = 3$ , then The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying.

Scripter: Please leave this text on the screen for Q8-Q10.

If  $X1 < 3$ , then skip this text.

**Q8.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] has [if  $X6 = 1$ , then the best; if  $X6 = 2$ , then the worst] energy efficiency class? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

**Q9.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] uses [if  $X6 = 1$ , then the largest; if  $X6 = 2$ , then the smallest] amount of energy? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

**Q10.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] uses [if  $X6 = 1$ , then the smallest; if  $X6 = 2$ , then the largest] amount of water? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

*Scripter: randomize Q8 t/m Q10 (and store display order in data set), Q11 is always the last question.*

*Scripter: Respondents should be able to select one or more products from the choice set OR response option "I (really) don't know".*

**Q11.** If you would have to make a choice among these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers], which one would you buy?

*Scripter: Please record the time spent on the screen and store this in the data.*

*Scripter: Respondents should be able to select one product from the choice set OR response option "I (really) don't know".*

*If  $X5 = 1$ :*

*If  $X1 = 3$ , then The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying.*

*Scripter: Please leave this text on the screen for Q8-Q10.*

*If  $X1 < 3$ , then skip this text.*

**Q8.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] has [if  $X6 = 1$ , then the largest; if  $X6 = 2$ , then the smallest] load capacity\*? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

*If  $X1 = 1$ : \* The load capacity of a dishwasher is expressed as the maximum number of standard place settings (i.e. crockery, glass and cutlery for use by one person) that the machine can clean and dry.*

*If  $X1 = 2$ : \* The load capacity of a washing machine is expressed as the maximum weight of the (dry) laundry that the machine can wash.*

*If  $X1 = 3$ : \* The load capacity of a washer-dryer is expressed as the maximum weight of the (dry) laundry that the machine can both wash and dry in a complete cycle.*

**Q9.** Which machine's (tested) programme takes [if  $X6 = 1$ , then the shortest; if  $X6 = 2$ , then the longest] amount of time? *Multiple answers possible.*

*Scripter: Please record the time spent on the screen and store this in the data.*

**Q10.** Which of these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] is [if  $X6 = 1$ , then the least; if  $X6 = 2$ , then the most] quiet? Multiple answers possible.

Scripter: Please record the time spent on the screen and store this in the data.

Scripter: randomize Q8 t/m Q10 (and store display order in data set), Q11 is always the last question.

Scripter: Respondents should be able to select one or more products from the choice set OR response option "I (really) don't know".

**Q11.** If you would have to make a choice among these [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers], which one would you buy?

Scripter: Please record the time spent on the screen and store this in the data.

Scripter: Respondents should be able to select one product from the choice set OR response option "I (really) don't know".

## **END OF PART 2B.**

## **END OF PART 2.**

## **PART 3. COMPREHENSION TEST (ISOLATED ICONS)**

Screen 15 [Introduction Part 2]

If  $X2 = 1$ :

The second part of this questionnaire is about a new energy label for [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers].

If  $X2 = 2$ , then skip this screen.

Screen 16 [Trust]

Imagine that you are in a store to buy a [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer]. You see this energy label of the [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] that the store sells.

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "FULL1\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "FULL1\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "FULL1\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "FULL2\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "FULL2\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 1$ , then display "FULL2\_V3A.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 2$ , then display "FULL2\_V3B.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "FULL3\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "FULL3\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 1$ , then display "FULL3\_V3A.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 2$ , then display "FULL3\_V3B.jpg"

**Q12.** Would you trust the information on this label to be correct?

Certainly not	1	2	3	4	5	Certainly so
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**Q13.** Would you believe that this is the official EU energy label?

Certainly not	1	2	3	4	5	Certainly so
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**Screen 17 [Comprehension of icons in isolation]**

On the next screens, you will see various symbols that may be used on a new energy label for [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers]. You will see the symbols one by one.

We are interested in your opinion regarding how clear or unclear these symbols are. If you think a symbol is not clear, please do not hesitate to indicate that. Your answers help us in improving the label design to ensure that it is well understood by consumers in Europe.

*Scripter: randomize order of blocks 1, 2, 3, and 4 (and store display order in data set).*

**BLOCK 1****Screen 18 [Water consumption icon]**

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I1\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I1\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I1\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I1\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I1\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I1\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I1\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I1\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I1\_V3.jpg"

*Example:*



*All respondents:*

**Q14.** Do you think this symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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**Q15.** What do you think this symbol indicates?

- 1 The volume of the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$  OR 3, then drum]
- 2 The water consumption of one wash cycle
- 3 The machine determines automatically how much detergent is needed (auto-dosing system)
- 4 The machine has an intensive cleaning programme
- 5 None of the answers is correct
- 6 I (really) don't know

**Screen 19 [Water consumption icon]**

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I1\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I1\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I1\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I1\_V1.jpg"



If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I1\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I1\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I1\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I1\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I1\_V3.jpg"

Example:



The symbol represents the water consumption of one wash cycle in litres. This symbol thus indicates how many litres of water the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] uses for one wash.

All respondents:

**Q16.** Now you know its meaning, do you think the symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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Screen 20 [Perceived importance]

All respondents:

Imagine that you are planning to buy a new [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer].

	Not at all important	Not very important	Fairly important	Very important	Extremely important
<b>Q17.</b> How important would information about water consumption be to you when comparing [if $X1 = 1$ , then dishwashers; if $X1 = 2$ , then washing machines; if $X1 = 3$ , then washer-dryers]?	1	2	3	4	5
<b>Q18.</b> How important would it be to you that this information is displayed on the energy label?	1	2	3	4	5

END OF BLOCK 1

BLOCK 2

Screen 21 [Capacity]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I2\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I2\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I2\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I2\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I2\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I2\_V3.jpg"



If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I2\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I2\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I2\_V3.jpg"

Example:



All respondents:

**Q19.** Do you think this symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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**Q20.** What do you think this symbol indicates? It indicates...

If  $X1 = 1$ :

- 1 that a maximum of 36 plates and 36 glasses fit into the dishwasher
- 2 that a maximum of 12 plates and 12 glasses fit into the dishwasher
- 3 that the dishwasher can properly clean and dry a maximum of 12 standard place settings\*
- 4 that the dishwasher has 12 different wash programmes
- 5 None of the answers is correct
- 6 I (really) don't know

\* mouse roll-over "standard place settings": i.e. crockery, glass and cutlery for use by one person, for soup, main course and dessert.

If  $X1 = 2$ :

**Q20.** What do you think this symbol indicates? It indicates...

- 1 The weight of the machine
- 2 The machine senses the load and adjusts the programme accordingly (automatic load detection)
- 3 The number of garments that the machine can wash (load capacity)
- 4 The maximum weight of the (dry) laundry that the machine can wash (load capacity)
- 5 None of the answers is correct
- 6 I (really) don't know

If  $X1 = 3$ :

- 1 The weight of the machine
- 2 The machine senses the load and adjusts the programme accordingly (automatic load detection)
- 3 The number of garments that the machine can wash and dry (load capacity)
- 4 The maximum weight of (dry) laundry that the machine can both wash and dry in one cycle (load capacity)
- 5 None of the answers is correct
- 6 I (really) don't know

Screen 22 [Capacity]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I2\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I2\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I2\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I2\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I2\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I2\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I2\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I2\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I2\_V3.jpg"

Example:



The symbol represents the load capacity of the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer]. If  $X1 = 1$ , then: The load capacity of a dishwasher is expressed as the maximum number of standard place settings (i.e. crockery, glass and cutlery for use by one person, for soup, main course and dessert). If  $X1 = 2$ , then: The load capacity of a washing machine is expressed as the maximum weight in kilograms of the (dry) laundry that the machine can wash. If  $X1 = 3$ , then: The load capacity of a washer-dryer is expressed as the maximum weight in kilograms of the (dry) laundry that the machine can both wash and dry in one cycle.

All respondents:

**Q21.** Now you know its meaning, do you think the symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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Screen 23 [Perceived importance]

All respondents:

Imagine that you are planning to buy a new [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer].

	Not at all important	Not very important	Fairly important	Very important	Extremely important
<b>Q22.</b> How important would information about the load capacity be to you when comparing [if $X1 = 1$ , then dishwashers; if $X1 = 2$ , then washing machines; if $X1 = 3$ , then washer-dryers]?	1	2	3	4	5
<b>Q23.</b> How important would it be to you that this information is displayed on the energy label?	1	2	3	4	5

END OF BLOCK 2

BLOCK 3

Screen 24 [Programme duration]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I3\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I3\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I3\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I3\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I3\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I3\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I3\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I3\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I3\_V3.jpg"

Example:



All respondents:

**Q24.** Do you think this symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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**Q25.** What do you think this symbol indicates?

- 1 The availability of a timer function to delay the start of the programme to a later time (delay start)
- 2 The durability of the machine
- 3 The duration of the tested programme loaded at full capacity
- 4 The machine has a digital clock
- 5 None of the answers is correct
- 6 I (really) don't know

Screen 25 [Programme duration]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I3\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I3\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I3\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I3\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I3\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I3\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I3\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I3\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I3\_V3.jpg"

Example:



This symbol represents the duration of the (tested) programme loaded at full capacity. This symbol thus indicates the amount of time it takes for the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] to complete the programme.

**Q26.** Now you know its meaning, do you think the symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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Screen 26 [Perceived importance]

All respondents:

Imagine that you are planning to buy a new [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer].

	Not at all important	Not very important	Fairly important	Very important	Extremely important
<b>Q27.</b> How important would information about the duration of the (tested) programme be to you when comparing [if $X1 = 1$ , then dishwashers; if $X1 = 2$ , then washing machines; if $X1 = 3$ , then washer-dryers]?	1	2	3	4	5
<b>Q28.</b> How important would it be to you that this information is displayed on the energy label?	1	2	3	4	5

END OF BLOCK 3

BLOCK 4

Screen 27 [Noise level]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I4\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I4\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I4\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I4\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I4\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I4\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I4\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I4\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I4\_V3.jpg"

Example:



All respondents:

**Q29.** Do you think this symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
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**Q30.** What do you think this symbol indicates?

- 1 The noise level
- 2 The machine is connected to Wi-Fi and can be controlled and monitored using a smartphone
- 3 The machine has a silent mode
- 4 The vibrations produced by the machine
- 5 None of the answers is correct
- 6 I (really) don't know

Screen 28 [Noise level]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "EL1\_I4\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "EL1\_I4\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "EL1\_I4\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "EL2\_I4\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "EL2\_I4\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$ , then display "EL2\_I4\_V3.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "EL3\_I4\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "EL3\_I4\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$ , then display "EL3\_I4\_V3.jpg"

Example:



This symbol indicates the maximum noise level of the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] in decibel. This symbol thus indicates how quiet (or noisy) the [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer] is.

**Q31.** Now you know its meaning, do you think the symbol is clear or unclear?

Very unclear	1	2	3	4	5	Very clear
--------------	---	---	---	---	---	------------

Screen 29 [Perceived importance]

All respondents:

Imagine that you are planning to buy a new [if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer].

	Not at all important	Not very important	Fairly important	Very important	Extremely important
<b>Q32.</b> How important would information about the noise level be to you when comparing [if $X1 = 1$ , then dishwashers; if $X1 = 2$ , then washing machines; if $X1 = 3$ , then washer-dryers]?	1	2	3	4	5

<b>Q33.</b> How important would it be to you that this information is displayed on the energy label?	1	2	3	4	5
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END OF BLOCK 4

#### **PART 4. COMPREHENSION TEST (FULL LABELS)**

Screen 30 [Introduction product-specific comprehension questions]

On the next screens, you will see the energy label for [if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers] again in its entirety.

Now, you will read a number of statements. Please indicate, for each statement, whether you think the statement is true or false. If you do not know the answer, please do not hesitate to tick the "I (really) don't know" box. Your answers help us in improving the label design to ensure that it is well understood by consumers in Europe.

Screen 31-41 [Product-specific comprehension questions]

If  $X1 = 1$  (Dishwashers) &  $X3 = 1$ , then display "FULL1\_V1.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 2$ , then display "FULL1\_V2.jpg"

If  $X1 = 1$  (Dishwashers) &  $X3 = 3$ , then display "FULL1\_V3.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 1$ , then display "FULL1\_V1.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 2$ , then display "FULL1\_V2.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 1$ , then display "FULL1\_V3A.jpg"

If  $X1 = 2$  (Washing machines) &  $X3 = 3$  &  $X4 = 2$ , then display "FULL1\_V3B.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 1$ , then display "FULL1\_V1.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 2$ , then display "FULL1\_V2.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 1$ , then display "FULL1\_V3A.jpg"

If  $X1 = 3$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 2$ , then display "FULL1\_V3B.jpg"

If  $X1 = 1$  (Dishwashers):

**Q34\_1.** The top part of the label pertains to the intensive programme and the bottom part to the ECO programme (FALSE).

**Q34\_2.** All information on the label pertains to the ECO programme (TRUE).

**Q34\_3.** The dishwasher has an ecolabel, which shows that the dishwasher does less harm to the environment than similar dishwashers (FALSE).

**Q34\_4.** This dishwasher has a special ECO programme, only available in some dishwashers, which uses less energy and water than other programmes (FALSE).

**Q34\_5.** The label displays the energy efficiency, energy consumption and water consumption of the dishwasher when the ECO programme is being used (TRUE).

**Q34\_6.** The water consumption of this dishwasher is 9 litres per wash cycle when the ECO programme is being used (TRUE).

**Q34\_7.** The energy consumption of this dishwasher is 0.751 kWh per year when the ECO programme is being used (FALSE).

Scripter: please randomize the order of the statements.

1 True

2 False

3 I (really) don't know

If  $X1 = 2$  (Washing machines):

**Q34\_1.** The top part of the label pertains to the average energy consumption and the bottom part to the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) (FALSE).

**Q34\_2.** All information on the label pertains to the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) (TRUE).

**Q34\_3.** The washing machine has a special (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme), only available in some washing machines, which uses less energy and water than other wash programmes (FALSE).

**Q34\_4.** The label displays the energy efficiency, energy consumption and water consumption of the washing machine when the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) is being used (TRUE).

**Q34\_5.** The water consumption of this washing machine is 39 litres per wash cycle when the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) is being used (TRUE).

**Q34\_6.** The energy consumption of this washing machine is 0.55 kWh per year when the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) is being used (FALSE).

*Scripter: please randomize the order of the statements.*

1 True

2 False

3 I (really) don't know

If  $X1 = 3$  (Washer-dryers):

**Q34\_1.** The information on the right side of the label pertains to a wash cycle (so washing-only) (TRUE).

**Q34\_2.** The information on the left side of the label pertains to a dry cycle (so drying-only) (FALSE).

**Q34\_3.** The information on the left side of the label pertains to a complete wash and dry cycle (TRUE).

**Q34\_4.** The top part of the label pertains to the average energy consumption and the bottom part of the label pertains to the wash and dry programme (FALSE).

**Q34\_5.** All information on the label pertains to the wash and dry programme (FALSE).

**Q34\_6.** The washer-dryer has a special (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme), only available in some washer-dryers, which uses less energy and water than other programmes (FALSE).

**Q34\_7.** The left side of the label displays the energy efficiency, energy consumption and water consumption of the washer-dryer when the wash and dry programme is being used (TRUE).

**Q34\_8.** The right side of the label displays the energy efficiency, energy consumption and water consumption of the wash cycle of the washer-dryer when the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) is being used (TRUE).

**Q34\_9.** The water consumption of this washer-dryer is 80 litres per wash and dry cycle when the wash and dry programme is being used (TRUE).

**Q34\_10.** The energy consumption of this washer-dryer is 4.69 kWh per year when the wash and dry programme is being used (FALSE).

**Q34\_11.** The energy consumption of the washer-dryer is 4.69 kWh per wash cycle when the (if  $X4 = 2$ , then 40-60 programme; if  $X4 \neq 2$ , then ECO 40-60 programme) is being used (TRUE).

*Scripter: please randomize the order of the statements.*

1 True

2 False

3 I (really) don't know

Screen 42

If  $X1 < 3$ , skip this screen.

*If X1 = 3 (Washer-dryers) & X3 = 1, then display "FULL1\_V1.jpg"*

*If X1 = 3 (Washer-dryers) & X3 = 2, then display "FULL1\_V2.jpg"*

*If X1 = 3 (Washer-dryers) & X3 = 3 & X4 = 1, then display "FULL1\_V3A.jpg"*

*If X1 = 3 (Washer-dryers) & X3 = 3 & X4 = 2, then display "FULL1\_V3B.jpg"*

*If X1 = 3 (Washer-dryers):*

The energy label shown here displays the energy efficiency of a complete wash and dry cycle on a scale from A to G (left side) and the energy efficiency of a wash cycle (so only washing, not drying) on a scale from A to G (right side).

**Q35.** If you were looking for a washer-dryer, would you find it useful that the energy label displays this information both for the complete wash and dry cycle as well as for the wash cycle only?

1 Yes, I find it useful that this information is displayed on a single label

2 No, I would prefer a label that only displays this information for the complete wash and dry cycle

3 No, I would prefer a label that only displays this information for the wash cycle

4 No, I would prefer two separate labels: one with the information for the complete wash and dry cycle and one with the information for the wash cycle

5 Other, namely...

*Screen 43*

*All respondents:*

Our last question regarding the energy label for [*if X1 = 1, then dishwashers; if X1 = 2, then washing machines; if X1 = 3, then washer-dryers*] is about the noise level.

Currently, the energy label provides information on the maximum noise level of the [*if X1 = 1, then dishwasher; if X1 = 2, then washing machine; if X1 = 3, then washer-dryer*], expressed in decibels (e.g. 60dB). This allows consumers to spot even small differences in the noise level between machines.

However, it is also possible to classify [*if X1 = 1, then dishwashers; if X1 = 2, then washing machines; if X1 = 3, then washer-dryers*] into three broader categories – quiet, medium, and noisy – and show on the label the category that the particular [*if X1 = 1, then dishwasher; if X1 = 2, then washing machine; if X1 = 3, then washer-dryer*] belongs to. [*if X1 = 1, then For example, dishwashers with a maximum noise level lower than 42dB are classified as "night mode", dishwashers with a noise level between 42 and 47dB are classified as "whispering", and dishwashers with a noise level above 47dB are classified as "normal"; if X1 = 2, then For example, washing machines with a maximum noise level lower than 72dB are classified as "quiet", washing machines with a noise level between 72 and 77dB are classified as "normal", and washing machines with a noise level above 77dB are classified as "loud"; if X1 = 3, then For example, washer-dryers with a maximum noise level lower than 72dB are classified as "quiet", washer-dryers with a noise level between 72 and 77dB are classified as "normal", and washer-dryers with a noise level above 77dB are classified as "loud"*], which might facilitate interpretation.

**Q36.** If you were looking for a [*if X1 = 1, then dishwasher; if X1 = 2, then washing machine; if X1 = 3, then washer-dryer*], which information would you prefer to find on the label?

1 An indication of the noise level in decibels

2 An indication of the noise level in categories (quiet, medium, noisy)

3 An indication of the noise level both in decibels and categories (quiet, medium, noisy)

4 I do not have a clear preference



**END OF PART 4**

**PART 5. BACKGROUND INFORMATION**

Screen 44 [Product category experience]

All respondents:

Finally, in this third and last part, we would like to ask you a few general questions.

All respondents:

**Q37.** Have you purchased a dishwasher, washing machine or washer-dryer in the past 12 months? *Multiple answers possible.*

- 1 A dishwasher
- 2 A washing machine
- 3 A washer-dryer
- 4 No, none of these

All respondents:

**Q38.** Are you currently planning to purchase a dishwasher, washing machine or washer-dryer? *Multiple answers possible.*

- 1 A dishwasher
- 2 A washing machine
- 3 A washer-dryer
- 4 No, none of these

Screen 45 [Product category experience]

If  $Q38 < 4$ :

**Q39.** Have you looked up information about [*if  $Q38 = 1$ , then dishwashers; if  $Q38 = 2$ , then washing machines; if  $Q38 = 3$ , then washer-dryers*] in the past month?

- 1 Yes, extensively
- 2 Yes, a little
- 3 No, none

*Scripter: if multiple response options are selected in Q39, please repeat this question for all options selected.*

Screen 46 [Importance of energy-aspects relative to other features]

All respondents:

Imagine that you currently intend to purchase a [*if  $X1 = 1$ , then dishwasher; if  $X1 = 2$ , then washing machine; if  $X1 = 3$ , then washer-dryer*].

**Q40.** For each of the following aspects, please indicate how important you would consider that aspect when comparing different types and models of [*if  $X1 = 1$ , then dishwashers; if  $X1 = 2$ , then washing machines; if  $X1 = 3$ , then washer-dryers*].

- A. Brand
- B. Purchase price
- C. Load capacity
- D. Number of different programmes
- E. Duration of the standard programme
- F. Additional functionalities (e.g. *if  $X1 = 1$  (dishwasher), then delayed start option, automatic load sensing if  $X1 = 2$  (washing machine), then delayed start option, automatic dosing, automatic load sensing if  $X1 = 3$  (washer-dryer), then delayed start option, automatic dosing, anti-crease*)
- G. Energy consumption/energy efficiency

- H. Water consumption
- I. Noise level
- J. The machine's design/look
- K. Warranty

Scripter: randomize order of product attributes

- 1 Extremely important
- 2 Very important
- 3 Fairly important
- 4 Not very important
- 5 Not at all important

Screen 47 [Missing of information]

When you purchase a [if  $X7 = 1$ , then washer-dryer; if  $X7 = 2$ , then dishwasher; if  $X7 = 3$ , then washing machine], you typically have a wide choice and a large amount of information to compare. The EU energy label helps consumers to quickly and easily find and compare information on the energy performance as well as other aspects of different products. Below, the energy label is shown once more in its entirety.

If  $X7 = 1$  (Washer-dryers) &  $X3 = 1$ , then display "FULL3\_V1.jpg"

If  $X7 = 1$  (Washer-dryers) &  $X3 = 2$ , then display "FULL3\_V2.jpg"

If  $X7 = 1$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 1$ , then display "FULL3\_V3A.jpg"

If  $X7 = 1$  (Washer-dryers) &  $X3 = 3$  &  $X4 = 2$ , then display "FULL3\_V3B.jpg"

If  $X7 = 2$  (Dishwashers) &  $X3 = 1$ , then display "FULL1\_V1.jpg"

If  $X7 = 2$  (Dishwashers) &  $X3 = 2$ , then display "FULL1\_V2.jpg"

If  $X7 = 2$  (Dishwashers) &  $X3 = 3$ , then display "FULL1\_V3.jpg"

If  $X7 = 3$  (Washing machines) &  $X3 = 1$ , then display "FULL2\_V1.jpg"

If  $X7 = 3$  (Washing machines) &  $X3 = 2$ , then display "FULL2\_V2.jpg"

If  $X7 = 3$  (Washing machines) &  $X3 = 3$  &  $X4 = 1$ , then display "FULL2\_V3A.jpg"

If  $X7 = 3$  (Washing machines) &  $X3 = 3$  &  $X4 = 2$ , then display "FULL2\_V3B.jpg"

**Q41.** Do you miss important information on this label?

- 1 No
- 2 Yes

Screen 48 [Missing of information]

If  $Q41 = 1$ , skip this screen.

If  $Q41 = 2$ :

**Q42.** What information do you miss?

[Text box]

Screen 49 [Self-reported product category expertise]

All respondents:

**Q43.** Please indicate how much you agree or disagree with the following statements.

		Strongly disagree					Strongly agree	
		1	2	3	4	5	6	7
1	I know a great deal about washing machines.	1	2	3	4	5	6	7
2	I know a great deal about washer-dryers.	1	2	3	4	5	6	7
3	I know a great deal about dishwashers.	1	2	3	4	5	6	7
4	I know more about white goods (e.g. washing machines, dishwashers) than most other people.	1	2	3	4	5	6	7

## Screen 50 [Pro-environmental self-identity]

**Q44.** Please indicate how much you agree or disagree with the following statements.

		Strongly disagree					Strongly agree	
1	In my daily activities, I am conscious about saving energy.	1	2	3	4	5	6	7
2	I am worried about the environment.	1	2	3	4	5	6	7

## Screen 51

**Q45.** How important is energy consumption to you when you buy households products, such as dishwashers and washing machines?

- 1 Extremely important
- 2 Very important
- 3 Fairly important
- 4 Not very important
- 5 Not at all important

## Screen 52

If Q45 < 4:

**Q46.** There are various reasons why people pay attention to energy consumption and/or energy efficiency when buying household products, such as dishwashers and washing machines. What would be the most important reason for you, personally?

- 1 I want to save costs (a lower electricity bill)
- 2 I want to protect the environment and combat climate change
- 3 I want to keep up with the times and own the newest technologies
- 4 Other, namely...
- 5 I (really) don't know

## Screen 53 [Socio-demographics]

All respondents:

**Q47.** What is your gender?

- 1 Man
- 2 Woman

All respondents:

**Q48.** What is your age?

All respondents:

**Q49.** At what stage did you complete your full-time studies?

- 1 Elementary (primary) school or less
- 2 Some high (secondary) school
- 3 Graduation from high (secondary) school
- 4 Graduation from college, university or other third-level institute
- 5 Post-graduate degree (Masters, PhD)
- 6 Still studying full-time
- 7 Other qualification
- 8 Prefer not to answer

All respondents:

**Q50.** Thinking about your household's financial situation, would you say that making ends meet every month is:

- 1 Very difficult

- 2 Fairly difficult
- 3 Neither easy nor difficult
- 4 Fairly easy
- 5 Very easy
- 6 Don't know

**END OF PART 5**



# Study on consumer understanding of draft energy labels for household washing machines, household washer-dryers and household dishwashers

## *Management Summary*

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*Date: 20 August 2018*

The information and views set out in this study are those of the author(s) and do not necessarily reflect the official opinion of the European Commission.

# **Study on consumer understanding of draft energy labels for household washing machines, household washer-dryers and household dishwashers**

Specific contract No. FWC ENER/C3/2015-631/04 under  
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CentERdata consortium

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## 1. Study purpose

The EU energy label, as provided for by Regulation (EU) 2017/1369, repealing Directive 2010/30/EU, aims at promoting the uptake of more efficient energy-related products. It aims to help consumers make informed choices by facilitating product comparisons among different models with different characteristics such as energy consumption during product use. The label focuses on the energy efficiency of the product, but also allows the inclusion of other environmental aspects (such as water consumption or noise level) relevant to consumers to make an informed choice.

The purpose of the present study is to inform the design of new energy labels for dishwashers, washing machines, and washer-dryers. More specifically, the study aimed to test understanding of new icon and label designs among a large, heterogenous sample of European consumers, and to assess the perceived relevance of the information provided.
















## 2. Icon and label designs tested

For this study, draft icons and labels for the three product groups were developed in consultation with the Commission. The design process included the (re-)design of icons representing the water consumption, number of place settings (for dishwashers), maximum load (for washing machines and washer-dryers), programme duration, and noise level (see Table 1). For each feature, three different icon alternatives were developed and tested. The icons were combined into full energy labels (see Table 2-4). For washer-dryers, the label provided all information both for the complete wash and dry cycle as well as for the wash cycle only (see Table 4). Furthermore, the labels included an indication of the tested programme (e.g. the 'ECO' programme for dishwashers, see Table 2). The position of this information varied across the label alternatives. Two different names for the tested programme were included in this study ('ECO 40-60' and '40-60', see alternatives 3A and 3B in Tables 3 and 4). For each product group, the name of the tested programme was displayed either with (alternative 3) or without a visual representation of a cycle (alternatives 1 and 2). In the latter case, numbers were provided with the indication "/cycle" whenever relevant. All labels were developed in one of the potential new house style designs that were developed in a parallel project.<sup>1</sup>

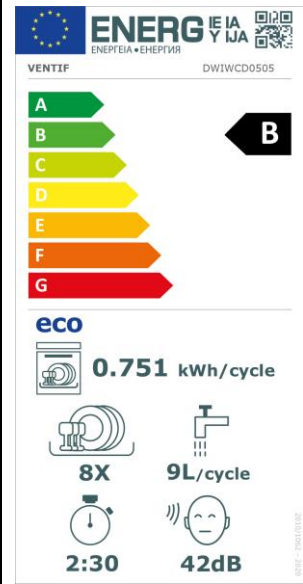
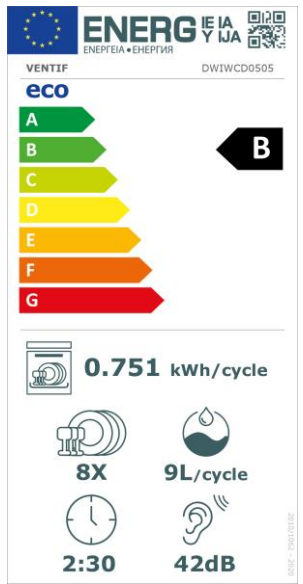
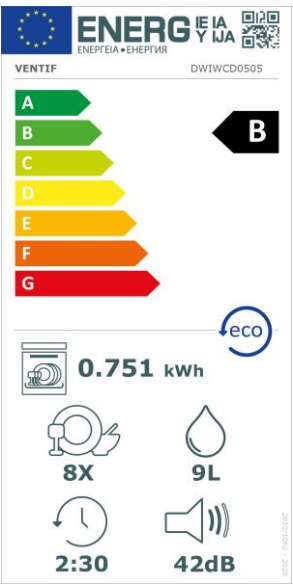
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<sup>1</sup> Study on the impact of a draft energy label on consumer understanding and purchase decisions for household refrigerating appliances. Specific contract No. ENER/C3/FV2017-438/10/FWC2015-631/02 under Framework contract No. ENER/C3/2015-631.

**Table 1. Icon alternatives**

Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 <b>39L</b>	 <b>39L</b>	 <b>39L</b>
Number of place settings (dishwashers)	 <b>12X</b>	 <b>12X</b>	 <b>12X</b>
Maximum load (washing machines/washer-dryers)	 <b>8kg</b>	 <b>8kg</b>	 <b>8kg</b>
Programme duration	 <b>4:00</b>	 <b>4:00</b>	 <b>4:00</b>
Noise level	 <b>72dB</b>	 <b>72dB</b>	 <b>72dB</b>

**Table 2. Label alternatives: dishwashers**

Label alternative 1	Label alternative 2	Label alternative 3
 <p>ENERGY LABEL ENERGIA • ENERGIJA</p> <p>eco <b>0.751 kWh/cycle</b></p> <p>8X 9L/cycle</p> <p>2:30 42dB</p>	 <p>ENERGY LABEL ENERGIA • ENERGIJA</p> <p>eco <b>0.751 kWh/cycle</b></p> <p>8X 9L/cycle</p> <p>2:30 42dB</p>	 <p>ENERGY LABEL ENERGIA • ENERGIJA</p> <p>eco <b>0.751 kWh</b></p> <p>8X 9L</p> <p>2:30 42dB</p>



**Table 3. Label alternatives: washing machines**

Label alternative 1	Label alternative 2	Label alternative 3A	Label alternative 3B

**Table 4. Label alternatives: washer-dryers**

Label alternative 1	Label alternative 2	Label alternative 3A	Label alternative 3B

An online survey was administered to approximately 1350 panel members of GfK's online panels in each of 7 countries (9863 respondents in total): Bulgaria, Denmark, Germany, Italy, The Netherlands, Portugal and Romania. In the survey, respondents saw only one of the icon or label alternatives for the specific product group (randomly decided).

### 3. Summary of results

This section provides a summary of key findings. We first discuss the findings related to the perceived relevance of the product features of interest. Next, we provide an

overview of the results on icon understanding (across the three product groups). Finally, comprehension results related to other label information (e.g. the indication of the tested programme) are discussed.

### Perceived relevance of the features

For each of the features of interest in this study (i.e. water consumption, load capacity, programme duration and noise level), Table 5 provides an overview of the percentage of respondents who found it (very or extremely) important that the information is displayed on the energy label. For all features and all product groups, the majority of respondents considered it important that the energy label displays this information. For dishwashers, most respondents considered information on the water consumption relevant to include on the label (71.5%, see Table 5). For washing machines and washer-dryers, water consumption (69.0% and 71.0%, respectively) as well as load capacity (69.9% and 69.5%, respectively) were perceived as most important to include on the label.

**Table 5. Perceived importance**

	% of respondents who find it important that the feature is displayed on the energy label		
	Dishwashers	Washing machines	Washer-dryers
Water consumption	71.5%	69.0%	71.0%
Load capacity	58.7%	69.9%	69.5%
Programme duration	66.5%	52.8%	56.5%
Noise level	63.4%	60.4%	61.4%
















### Comprehension of the icons

Table 6 and 7 provide an overview of the comprehension results across all product types. A distinction is made between **subjective comprehension** (i.e. does the consumer *think* s/he understands the meaning of the icon, does s/he perceive the icon as being clear?) and **objective comprehension** (i.e. does the consumer *actually* understand the meaning of the icon?). Subjective comprehension ("Do you think this icon is clear or unclear?") was measured on a 5-point scale from *very unclear* to *very clear*. Objective comprehension was assessed for icons presented **in isolation** (multiple choice quiz question) as well as for icons embedded in full labels in the **context of a (small) product assortment** (product identification task). In the latter case, respondents were exposed to an assortment of eight products (either dishwashers, washing machines or washer-dryers) and asked to identify the product(s) with either the highest or lowest level on that feature (e.g. "Which of these dishwashers uses the smallest amount of water?").

Table 6 and 7 provide an overview of the icon alternatives that performed best overall. Table 7 shows the comprehension results separately for subjective comprehension (icons in isolation) and objective comprehension (icons in isolation and in product context), and Table 6 shows the integrated findings. For the water consumption icon, icon alternative 1 clearly outperformed the other two icon alternatives (see Table 7). For the icons representing maximum load (for washing machines and washer-dryers) and the duration of the tested programme, all icon alternatives performed more or

less equally well. For the maximum load icon, there were no differences across the alternatives on any of the comprehension measures. For the programme duration icon, the results were less clear-cut. Icon alternatives 1 and 2 performed better in terms of subjective comprehension (perceived clarity), whereas alternative 3 performed better in terms of objective comprehension (i.e. ability to identify the correct product among a small product assortment; see Table 7). Overall, alternative 2 of the icon representing the number of place settings best communicated its intended meaning. However, icon alternatives 1 and 3 performed at least equally well on specific comprehension aspects (see Table 7). Finally, and similarly, alternative 2 of the noise level icon performed best overall, and clearly outperformed alternative 3 on all aspects. Icon alternative 1 yielded better product identification in a product context, but only for washing machines.

**Table 6. Best (green) vs. worst (red) performing icons: all product groups**

Icons	Icon alternative 1	Icon alternative 2	Icon alternative 3
Water consumption	 39L	 39L	 39L
Number of place settings (dishwashers)	 12X	 12X	 12X
Maximum load (washing machines and washer-dryers)	 8kg	 8kg	 8kg
Programme duration	 4:00	 4:00	 4:00
Noise level	 72dB	 72dB	 72dB

Noteworthy, for the icons representing water consumption and noise level, the results revealed a clear gap between subjective and objective comprehension. While a large majority of respondents indicated that they understood, or thought they understood, the meaning of the icons (typically in the range of 75% to 90%), at most about two-third of the respondents correctly identified the appliance(s) that they were supposed to find in the product identification tasks. It seems that many respondents had difficulty actually searching for and comparing the right information. However, this gap was particularly large for the washer-dryers, which may be explained by the fact that this label displays double information. Respondents may have looked at the wrong

part of the label in the product identification task, explaining their relatively poor performance.

**Table 7. Best performing icons: subjective vs. objective comprehension**

	Subjective comprehension (icons in isolation)	Objective comprehension	
		Icons in isolation	Icons in product context
Water consumption	Alternative 1 (all products)	Alternative 1 (all products)	Alternative 1 + 2
Number of place settings (dishwashers)	Alternative 2	Alternative 3	Alternative 1 + 2
Maximum load (washing machines and washer-dryers)	No differences	No differences	No differences
Programme duration	Alternative 2 + 3	No differences	Alternative 1
Noise level	Alternative 2 (all products)	No differences	Alternative 1

### Comprehension of other label information

In order to test whether respondents also understood other information on the label, such as the indication of the tested programme and the information per cycle (rather than per year), respondents were exposed to one of the full label alternatives (see Table 2-4) and responded to a number of true/false statements. Understanding of those aspects is quite low, in general, with the percentage of respondents who responded correctly to *all* statements related to a specific label aspect (e.g. understanding that the information is provided per cycle) ranging between 8.8% and 47.9%.

Some label aspects contributed to (somewhat) higher levels of understanding:

- Label alternative 2 (see Table 2-4) with the tested programme indicated at the top of the label (above the energy efficiency scale) seemed to communicate more clearly that all information on the label pertains to the tested programme, as compared to other label alternatives.
- Label alternative 1 and 2 – where ‘cycle’ was indicated in words – seemed to communicate more clearly that the energy and water consumption are displayed per cycle compared to label variant 3 – where ‘cycle’ was represented graphically.

The washer-dryer label was more complex than the labels for the other two product groups as it contained information on both the complete wash and dry cycle as well as the wash cycle only. The results of the product identification task, which revealed relatively poor product identification for washer-dryers, seem to confirm this. To further explore whether the double information on the label has a detrimental effect on consumer understanding, we examined whether consumers were less able to identify the product with the best (or worst) energy performance when they were

exposed to washer-dryer labels as compared to washing machine labels.<sup>2</sup> Accurate identification of the product with the highest (or lowest) energy consumption was lower among respondents who saw washer-dryers (30.2%) than among respondents who saw washing machines (50.3%). It thus seems that a substantial group of respondents looked at the wrong part of the washer-dryer label. Nonetheless, a vast majority of respondents (76.6%) reported to prefer a single label that displays both information on the complete wash and dry cycle and the wash only cycle.

Finally, we examined which representation of the washer-dryer functions facilitated understanding of the 'wash and dry' and 'wash-only' parts of the label: separate icons (see label alternatives 1 and 2 in Table 4) or an integrated icon (see alternatives 3A and 3B in Table 4). A higher proportion of respondents accurately indicated that the left part of the label pertained to a wash and dry cycle (rather than a drying-only cycle) when the separate icons were shown (in alternatives 1 and 2) as compared to the integrated icon (alternatives 3A and 3B). However, respondents who were exposed to alternative 3A and 3B in turn seemed to better understand that the information on the right side of the label pertains to a washing-only cycle. Overall, understanding was slightly higher for alternative 3B than for all other alternatives.

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<sup>2</sup> Respondents who were exposed to washer-dryers were explicitly instructed to look at the information on the complete wash and dry cycle ("The energy performance of washer-dryers depends on whether you let the machine wash and dry your laundry, or just wash it. When answering the following questions, please assume that you are using the machine for washing and drying.")



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