Revision of the EU Ecolabel criteria for detergent and cleaning products

Proposals *for discussion in the 2nd AHWG meeting for all product groups protocols/frameworks to prove compliance with the criterion* ***Fitness for Use (FfU)***

The product groups (PGs) under the scope of the EU Ecolabel criteria under revision are:

• *"Dishwasher detergents"*	DD
• *"Industrial and institutional automatic dishwasher detergents".*	IIDD
• *"Laundry detergents"*	LD
• *"Industrial and institutional laundry detergents"*	IILD
• *"Hand dishwashing detergents".*	HDD
• *"Hard surface cleaning products"*	HSC

This documents is a compilation of the protocols/frameworks proving compliance with the *FfU* criterion in the 2nd draft criteria of the revision of the EU Ecolabel (EUEL) criteria for detergent, showing how existing (in force) criteria could be modified/updated according to evidences gathered by the JRC. It has been created to facilitate the discussion on FfU with members of the 2nd Ad Hoc Working Group (AHWG) meeting. They have been based on the compilation of all protocols/frameworks in existing EUEL criteria and were modified according to discussions held on a dedicated working sub-group (sub-AHWG) on the FfU topic. Readers are directed to the TR2 and the corresponding sub-AHWG on FfU background paper for full details on the rationales of the changes proposed.

In this document containing proposals for discussion, any change to the existing procotols/frameworks is highlighted in blue font, with deletions also showing strikethrough (~~like this~~) and proposals not (like this). Whatever the document being used, note that the base text used in all cases is that of the existing criteria accessible via the EU Ecolabel website. The aforementioned protocols/frameworks are:

LD [1]	*EU Ecolabel protocol for testing laundry detergents*
	EU Ecolabel protocol for testing stain removers
IILD	*Framework for performance testing for industrial and institutional laundry detergents* [2]
DD	*Framework performance test for dishwasher detergents* [3] (most updated version of EN 50242/EN 60436 or IKW standard test [4] as modified by this DD EU Ecolabel Framework)
IIDD	*Framework for performance testing for industrial and institutional dishwasher detergents* [5]
HDD	*Framework for testing performance for hand dishwashing detergents* [6]
HSC	Framework for testing the performance of hard surface cleaners [7]

1 Both test for LD in same document -> https://environment.ec.europa.eu/document/download/557d8ab5-4e75-41a4-a901-1548be7f685d_en?filename=fitness%20performance%20LD_V1.7_June%202023.pdf
2 https://environment.ec.europa.eu/document/download/789ae131-ee3a-4cdd-bfcd-6389aa3d8caa_en?filename=fitness%20performance%20IILD_V1.1_June%202023_0.pdf
3 https://environment.ec.europa.eu/document/download/ad5b72eb-dab6-4a64-9a37-53d028fec8d7_en?filename=Framework%20Fitness%20Performance%20-%20Dishwasher%20Detergent.pdf
4 https://www.ikw.org/fileadmin/IKW_Dateien/downloads/Haushaltspflege/2016_EQ_Dishwasher_Detergents_Part_B__Update_2015_aktualisiert.pdf
5 https://environment.ec.europa.eu/document/download/2a924067-033a-449d-808d-7586475a8cfc_en?filename=fitness_performance_IIDD_20180111.pdf
6 https://environment.ec.europa.eu/document/download/e0f5e99e-082e-4a70-91ee-70d7d9d00062_en?filename=Framework%20Fitness%20Performance%20-%20HDD.pdf
7 https://environment.ec.europa.eu/document/download/462d278a-2140-4bd2-bad2-fe0cf4a7b37a_en?filename=Fitness%20Performance%20-%20Hard%20Surface%20Cleaning%20Products_rev1.2.pdf

Revision Version 1.0; September 2024

[LD] Revised EU Ecolabel protocol for testing laundry detergents

Content

Abbreviations

HDD	Heavy duty detergent	DTI	Dye transfer inhibition
CSD	Colour safe detergent	SBL	Soil ballast load
LDD	Light duty detergent	PC	Sodium percarbonate
SR	Stain removal	TAED	Tetra acetyl ethylene diamine
BDW	Basic degree of whiteness	PVP	Polyvinylpyrrolidone
CM	Colour maintenance	CO	Cotton
PA	Polyamide	PES	Polyester
PES/CO	Polyester/cotton	WO	Wool
SI	Silk	AISE	International Association for Soaps, Detergents and Maintenance Products

Disclaimer

Note that throughout this protocol there might be mention to specific commercial products, brands and/or machine model/s which, unless otherwise explicitly indicated, are given for the convenience of users of this document, thus not constituting any endorsement by of such product/s named. Also, note that equivalent products might be commercially available after de date of publication of this protocol under different names/codes.

0. Background

This test protocol serves as a means of proof to show compliance with the criterion "Fitness for use" of the Commission Decision (EU) ~~2017/1218 of 23 June 2017~~ XXXX/YYYY[8] establishing EU Ecolabel criteria for "Laundry detergents". The product shall be fit for use, meeting the needs of users.

The test is for products that fall under the scope of the product group "Laundry detergents", which includes laundry detergents and stain removers. For each of these products, a different performance test is published, as specified in the Section 3.1 "Range of application".

The performance test for laundry detergents shall show that laundry detergents achieve good washing performance according to soil and stain removal, basic degree of whiteness,

[8] To be added the Commission Decision number once adopted

colour maintenance and dye transfer inhibition criteria. The product shall meet the requirements for wash performance set out in all the criteria listed in Section 1.

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

In addition to the performance test, it is the responsibility of the applicant to ensure that the product is safe to use on the intended use.

1. Test criteria

- soil and stain removal (SR)
- basic degree of whiteness (BDW)
- colour maintenance (CM)
- dye transfer inhibition (DTI)

2. Laboratory requirements to conduct the testing.

The manufacturer's test laboratory or/and an external test laboratory can be approved to conduct testing to document effectiveness of laundry detergents if the following requirements are met:

- it must be possible for EU Ecolabel competent bodies to monitor the performance of testing (e.g. on-site visits to the laboratory),
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets),
- whenever possible, the samples must be made anonymous for the test laboratory (e.g. product A and product B).
- the test laboratories must be equipped with the devices described in the test method,
- performance of the effectiveness test as well as the test method must be described in the quality control system.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council

3. Materials and conditions

The test institute must be able to prove compliance with all the test conditions laid down in the following paragraphs. Documentation demonstrating compliance with all the test conditions shall be part of the test report.

3.1. Range of application:

In the context of the EU Ecolabel, this performance test can be applied to the following types of laundry detergents and stain removers:

- Heavy-duty detergent (HDD) means a detergent used for ordinary washing of white textiles at any temperature
- Colour-safe detergent (CSD) means a detergent used for ordinary washing of coloured textiles at any temperature
- Light-duty detergent (LDD) means a detergent intended for delicate fabrics

3.2. Washing machine types:

Programmable electronic ~~Miele~~ household washing machines with stable performance / guaranteed reproducibility across models / washes, capable of disabling fuzzy logic[9] are eligible. Aiming to ensure equal testing conditions across washing machine models, water and energy consumption shall be monitored and recorded. They shall be calibrated and validated, at the minimum, every year.

Fuzzy logic type control shall be disabled and washing machines shall ~~which~~ fulfil the following requirements:

Table 1. Washing machine and wash programmes specifications

	Cotton wash program (at 30 °C, 20 °C~~[a]~~, 15 °C~~[ab]~~)	Delicate/Synthetic program~~[n]~~ (at 30 °C, 20 °C[a], 15 °C[b])
Duration main wash	50-70 min	30-40 min
Total program duration	100-120 min	55-65 min
Water quantity main wash	10~~5~~±2 l	20±2 l
Total water quantity	55±5 l	64±5 l
Number of rinse cycles	3	3
Final spin speed	1200 rpm[10]	600 rpm

~~[a] for cold water products~~

[ab] most of the older machines do not offer cold water programs. Those machines which offer cold water programmes normally heat up the entering water to 21 °C, which can be used for products that claim to be effective at 20 °C ("cold water products"). For test runs at 15 °C the heating elements of the washing machine have to be disconnected to prevent the heat up

~~[n] some newer washing machines offer an equivalent synthetic program~~

~~Fuzzy logic type control shall be disabled.~~

3.3. Water conditions:

Water hardness: 2,5 ± 0,2 mmol $CaCO_3$/l (equivalent to 14.0 ± 2.81°d). The Ca/Mg ratio shall be 3 ± 0,5.

Water inlet temperature: 20,0 ± 4,0 °C, except for those products that claim to be effective at lower temperatures. The water inlet temperature for products that claim to be effective at lower temperatures shall be 15,0 ± 4,0 °C, but the reference product shall be tested in this case at 20,0 ± 4,0 °C.

The amount of water shall be controlled along the washing process, if possible.

[9] WCI 360 WPS WTL is the trade name of a product supplied and/or manufactured by Miele. Equivalent products may be used if they can be shown to lead to the same results. ~~Miele machine was proposed as a reference machine due to its stable performance and regular quality of the outcomes.~~
~~For use in laboratories, Miele launched a special line of machines where the fuzzy logic can be disabled (e.g. Miele WCI 360 WPS WTL).~~
~~Another machine could be used as reference machine if it provides similar performance for a comparable programme.~~

[10] Other spin can be used but it should be at least 900 rpm

The water hardness and the water inlet temperature shall be reported for the test product and reference detergent.

3.4. Ballast load:

For HDD and CSD: cotton or synthetics/blends (polyester/cotton) ballast load.

The cotton base load ~~of cotton~~ shall consist of ~~cotton~~ pillowcases and ~~cotton~~ huckaback towels[11] while the synthetics/blends base load shall consist of men's shirts and pillowcases[12], both conforming the latest version of the IEC 60456 "*Clothes washing machines for household use – Methods for measuring the Performance*"~~10~~

For LDD: polyester ballast load.

The base load shall consist of double knitted polyester in pieces conforming to the following specifications[13].

Table 2. Ballast load for LDD

	Knitted polyester fabric.
Mass	35 ± 3 g
Mass per unit area	200 ± 25 g/m^2
Pieces	30±3cm x 30±3cm, double layer sewn along all four edges

[11] Examples of cotton commercial article codes are W-IEC T13 or E-353 for ~~cotton~~pillow cases and W-IEC T12 or E-351 for Huckaback Towels

[12] Examples of synthetics/blends (polyester/cotton) commercial article codes are W-IEC T14 for men's shirt and W-IEC T15 for pillow cases.

[13] Examples of commercial article codes are W-IEC MW or CFT E-356

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~~**Figure 1: Marking of the stain sets**~~	**Figure 2: Fixing of the stain sets on the base load**	~~**Figure 3: Marking of the stain sets**~~

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125 *3.5. Stains set*

126 The ~~current~~ AISE or equivalent stain set should be used (x14 stains; as described in Section
127 3.9.c.). Two sets of stains should be used per wash cycle (in the same batch) ~~should be used~~.
128 Do not mark ~~with a water resistant pen~~ each stain ~~as the Figure 1~~. Fix the stains on the loads
129 with a plastic staple ~~with a~~ gun ~~on the load, as shown in~~ (See Figure 2 ~~and Figure 3~~ and ~~See~~
130 Figure 4) ~~for an example of how the stains can be fixed~~.

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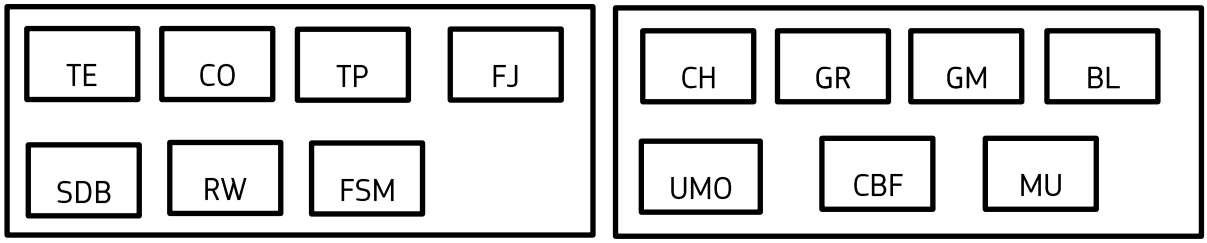

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133 **Figure 4. Example on how to fix~~ed~~ stains on the load ~~(example)~~** (See Table 10. for
134 abbreviations)

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~~Abbreviations stand for the type of soiling as indicated in Table 10.~~

Alternatively, the stains can be stitched together beforehand to make a full test strip. Then, this strip must be fixed on a hand towel before washing.

Another possibility~~ies~~ is using ~~are to use~~ a ready to use stain monitor, namely a commercial product already delivered with stains fixed to the fabric ([14])

~~*3.6. Stains set size*~~

The size for standard stains shall be ~~(~~12x12~~)~~ cm^2 ~~(standard stains)~~. The size for hand-made stains shall be 35x45cm AISE multiswatch monitors with 5x5cm swatches and 5 cm diameter ~~(hand-made)~~.

3.7. Ballast soil

Add standardised Soil Ballast Load (SBL) to simulate normally soiled laundry (approximately 32 g of ballast soil). SBL2004[15] or SBL-CFT[16] can be fixed on the loads as ballast soil ~~the stains~~.

Table 3. Soil Ballast Load (SBL) use

HDD & CSD		LDD	
Stain removal & basic degree of whiteness	Colour maintenance	Stain removal & basic degree of whiteness	Colour maintenance
4 units of SBL 2004 or SBL-CFT	2 units of SBL 2004 or SBL-CFT	2 units of SBL 2004 or SBL-CFT	2 units of SBL 2004 or SBL-CFT

3.8. Dye donators and dye acceptors to determine dye transfer

3.8.1 Dye donators:

- E-132 cotton dyed with direct black 22 (weight 0,3g => 5x6 cm)
- E-134 cotton dyed with direct orange 39 (weight 0,3g => 5x6 cm)
- E-130 cotton dyed with direct red 83,1 (weight 0,3g => 4,5 x 4,5 cm)
- E-131 cotton dyed with acid blue 113 (weight 0,3g => 5x10 cm)

3.8.2 Dye acceptors:

- standard cotton according to the latest ISO 2267 version ~~or DIN 53919~~, as for instance W-10A (size 5,5x16 cm)
- polyamide according to ISO 105 F03 (as for instance W-40 or T-ADJ polyamide) (size 6x16 cm)

[14] Examples of ready to use stain monitors ~~at the time of writing~~ are:
- Multiwatch monitors from Empa (Swissatest), WFK or CFT
- Multistain monitors from Equest or CFT with the handmade stains directly applied on the fabric
- Multiswatch monitor with a combination of standard swatches in combination with handmade stains cut out and sewn as well.

[15] The supplier of SBL 2004 is WFK (http://www.testgewebe.de).
[16] The supplier of SBL-CFT is CFT (https://www.cftbv.nl/)

3.9. Wash loads

Each series of tests shall be started with a new wash load. This load consists of:

a) Stain removal & basic degree of whiteness for HDD/CSD (powder and liquid)

1. A new ~~all~~ cotton (100%) or polyester/cotton (65%/35%) ballast load for the normal cotton wash program to reach a total base load ~~weight~~ of 4,~~45~~ kg (See Table 4).

Table 4. Ballast load for testing the whiteness for HDD/CSD (powder and liquid)

	Cotton (100%)		**Polyester/Cotton** (65%/35%)	
Total base load (kg)	Pillowcases[17]	Hand-towel	Men's shirt	Pillowcases
4,~~45 kg~~ ± 0,1~~kg~~	12 units	Add until target load ~~weight~~	Add evenly until target base load[18]	

2. x2 standard cotton cloths, according to the latest ISO 2267 version ~~or DIN 53919~~ (size 20x20 cm)

3. x2 Stain removal monitor sets (x14 stains) ~~removal monitors~~, namely AISE stain set (See Table 10), to be included ~~in the~~ from washes 6 to 11. ~~x2 replicates~~

4. x4 pieces of SBL (SBL2004 or SBL-CFT) ~~soil ballast~~ added to all washes

The total test load per wash ~~including~~ (ballast load + SBL + cotton cloth + stain removal monitors) shall be 4,5 ±0,1 kg.

Table 5. Wash load for HDD and CSD (powder and liquid). Test: stain removal and basic degree for whiteness

Test		Pre-treatment			Basic degree of whiteness					Stain removal & basic degree of whiteness						Basic degree of whiteness			
cycle		-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
loads	~~Cotton~~ Ballast load*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Standard cotton cloth ~~according to ISO 2267~~**	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	x2 Stain removal set (x14 stains) ~~x 2 sets~~ per wash~~, cycle 6-11)~~									x	x	x	x	x	x				
	x4 SBL ~~Soil: 4 units of SBL2004 or SBL-CFT~~				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*Cotton (100%) or Polyester/Cotton (65%/35%); use the same wash load during all the test
** use the same cotton cloth during all the test

b) Colour maintenance for HDD/CSD (Powder and liquid)

1. A new ~~all~~ cotton (100%) load for the normal cotton wash program to reach a total base load ~~weight~~ of 4,~~45~~ kg (See Table 6).

Table 6. Ballast load for testing colour maintenance for HDD/SCD (powder and liquid)

Total base load (kg)	Pillowcases[19]	Hand-towel
4,~~45 kg~~ ± 0,1~~kg~~	12 units	Until weight

2. Colour maintenance monitor, namely AISE 14 monitor dye set (See **Table 8**)

[17] Approximate weight (g/piece), 240 ± 5
[18] The number of shirts and pillowcases shall not be more than one. Approximate weights (g/piece) shirt = 205 ± 10; pillowcase = 165 ± 10 g.
[19] Approximate weight (g/piece), 240 ± 5

3. x2 pieces of SBL (SBL2004 or SBL-CFT) ~~soil ballast~~ added to all washes

The total test load per wash ~~including~~ (ballast load + SBL ~~cotton cloth~~ + colour maintenance monitors) shall be 4,5 ±0,1 kg.

Table 7. Wash load for HDD (only if claimed) and CSD (powder and liquid). Test: colour maintenance

Test		Pre-treatment			Colour maintenance														
Cycle		-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
loads	Cotton ballast load*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Colour maintenance monitor (See Table **8**)**				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	X2 SBL ~~Soil: 2 of units SBL2004 or SBL-CFT~~				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*use the same wash load during the entire test
** use the same cloth during the entire test

~~The colour maintenance monitor sets are shown in~~

~~**Table 8**:~~

Table 8. Colour maintenance monitor (AISE 14 monitor dye set)

Fabric number of AISE (14) ~~Monitor~~ Dye set	Fabric number of AISE (14) Monitor Dye set	Dye Class
AISE 1	1	Sulphur black
AISE 3	2	Vat green
AISE 5	3	Vat blue
AISE 8	4	Direct yellow + cationic after-treatment (Tinofix ECO)
AISE 16	5	Reactive red
AISE 20	6	Reactive black (pale shade)
AISE 21	7	Reactive black (heavy shade)
AISE 22	8	Reactive orange
AISE 24	9	Reactive blue
AISE 26	10	Reactive violet
AISE 27	11	Reactive trichromatic combination
AISE 29	12	Reactive trichromatic combination
AISE 33	13	Disperse navy + heat set
AISE 39	14	Acidic red + syntan

c) Stain Removal & basic degree of whiteness for LDD

1. A new knitted polyester load for the normal delicate wash programs to reach a total weight of 2,~~45~~kg (see Table 2)

2. x2 standard cotton cloths, according to the latest ISO 2267 version ~~or DIN 53919~~ (size 20x20 cm)

3. x2 Stain removal monitor sets (x14 stains) ~~removal monitors~~, namely AISE stain set (See Table 10), to be included ~~in the~~ from washes 6 to 11. ~~x2 replicates~~

4. x2 pieces of SBL (SBL2004 or SBL-CFT) ~~soil ballast~~ added to all washes

The total test load per wash ~~including~~ (ballast load + SBL + cotton cloth + stain removal monitors) shall will be 2,5 ± 0,1 kg

Table 9 Wash loads for LDD (Powder and liquid). Test: stain removal and basic degree of whiteness

Test		Pre-treatment			Basic degree of whiteness					Stain removal & basic degree of whiteness						Basic degree of whiteness			
Cycle		-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
loads	Polyester ballast load*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Standard cotton cloth ~~according to ISO 2267~~**	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	x2 Stain removal set (x14 stains) ~~x 2 sets~~ per wash~~, cycle 6-11).~~ See Table 10									x	x	x	x	x	x				
	soil: 2 units of SBL2004 or SBL-CFT				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*use the same wash load during all the test
** use the same cotton cloth during all the test

~~The stain sets are shown in Table 10.~~

Table 10. Stain removal monitor set (AISE stain set) ~~**Set of stain**~~

~~Figure 5~~ Abbreviation	Stain	Standard stain			Hand-mad stains*	Stain classes**
TE	Tea		WFK 10J	CFT CS97	WE5LTWKC	Drink/bleachable
CO	Coffee			CFT KC H109	WE5ECWKC	Drink/bleachable
RW	Red wine			CFT KC H026	WE5RWWKC	Drink/bleachable
FJ	Fruit juice			CFT CS15		Drink/bleachable
TP	Tomato puree				WE5TPWKC	Food/bleachable
SDB	Salad Dressing Balsamico			CFT C-S-406		Food/bleachable, enzymatic
FSM	French squeezy mustard				WE5FSMWKC	Food/bleachable, enzymatic,
CO	Chocolate		WFK 10Z	CFT CS44		Food/ enzymatic
GR	Grass	EMPA 164		CFT CS07	WE5SGWKC	General soil /bleachable, enzymatic,
GR/ MU	Grass/mud				WE5GMWKC	General soil / bleachable, enzymatic, particulate
BL	Blood				WE5DASBWKC	General soil / enzymatic
UMO	Unused motor oil	EMPA 106	WFK 10RM	CFT C-01s		Grease, oil/ greasy, particulate
CBF	Cooked beef fat				WE5BBPC2 on polyester/cotton	Grease, oil/ greasy, enzymatic
MU	Make up	EMPA 143/2	WFK 10MU	CFT CS17	WE5FM2WKC	Cosmetics/ greasy, particulate

* ~~(~~ex Warwick-Equest~~)~~ All hand-made stains are also available in 2.5 cm diameter. Their code has "2.5" instead of "5"
** ~~(~~consumer denomination / chemical nature~~)~~

d) Colour maintenance for LDD

1. A new knitted polyester load for the normal delicate wash programs to reach a total weight of 2,~~45~~kg (see, Table 2)
2. Colour maintenance monitor, namely AISE 14 monitor dye set (See **Table 8**)
3. x2 pieces of SBL (SBL2004 or SBL-CFT) ~~soil ballast~~ added to all washes

The total test load per wash ~~including~~ (ballast load + SBL ~~cotton cloth~~ + colour maintenance monitors) shall ~~will~~ be 2,5 ±0,1 kg

Table 11. Wash loads for LDD (powder and liquid). Test: colour maintenance

Test		Pre-treatment			Colour maintenance														
Cycle		-3	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
loads	Polyester ballast load*	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Colour maintenance monitor (See Table **8**)**				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	x2 SBL ~~Soil: 2 of units SBL2004 or SBL-CFT~~				x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

*use the same wash load during the whole test
** use the same cloth during the whole test

3.10. Dosage

In the case of powder detergents dose detergent in the dispenser machine device, and in the case of liquid detergents dose detergent in the tumble using a plastic dosage unit.

Table 12. Detergent dosage

Type of detergent to test	Reference detergent				Market detergent
	Basic powder	Sodium percarbonate	TAED	PVP *	According to producer recommendation.
Powder HDD	55 ~~70~~g	10 ~~12,5~~g	2,0 ~~,5~~g	-	Medium soil/medium hard water recommendation. The dosage needs to comply with the Ecolabel criteria
Liquid HDD	55 ~~70~~g			-	
Powder and liquid CSD	55 ~~70~~g	-	-	1ml	
Powder and liquid LDD	35ml				Light soil/medium hard water recommendation. The dosage needs to comply with the Ecolabel criteria

* active substance: 45%, PVP IV, 30% (Sokolan HP 56K)

3.11. Reference detergent

Table 13. Reference detergents

Type of detergent	Reference detergent
HDD	~~Regular~~ The standard powder detergent IEC P (that can serve as reference for a detergent to wash white fabrics) is a reformulation of IEC-reference detergent A that contains percarbonate instead of perborate. This standard detergent is distributed as three separate components, that shall be stored separately ~~(because of~~ for proper stability ~~of storage)~~ , with the following composition: - 82% ~~IEC P BASE~~ base powder with enzyme and foam inhibitor (= IEC-~~PA* BASE powder,~~ See table below) - 15% sodium percarbonate - 3% bleach activator tetra-acetylethylenediamine (TAED)

Ingredient	~~%~~ Content[20] [%, w:w]	Tolerance (+/-) [%, w:w]	CAS n.
linear sodium alkyl benzene sulfonate	9.4 ~~11,4~~	0.9 ~~0,5~~	25155-30-0
ethoxylated fatty alcohol $C_{12/14}$ (7EO)	5.0 ~~6,1~~	0.5 ~~0,3~~	68439-50-9
sodium soap (tallow soap)	3.4 ~~4,2~~	0.3 ~~0,2~~	308075-99-2
foam inhibitor concentrate~~,~~ (12% silicon on inorganic carrier)	4.1 ~~5,1~~	0.4 ~~0,3~~	68989-22-0
sodium aluminium silicate zeolite 4A (80% active substance)	30.2[21] ~~36,7~~	3.0 ~~1~~	70955-01-0
sodium carbonate	12.4 ~~15,1~~	1.2 ~~1~~	497-19-8
sodium salt of a copolymer from acrylic and maleic acid (sokalan CP5)	2.6 ~~3,1~~	0.3 ~~0,2~~	60472-42-6
sodium silicate (SiO_2:Na_2O = 3.3:1)	3.2 ~~3,9~~	0.3 ~~0,2~~	1344-09-8
carboxymethylcellulose	1.3 ~~1,6~~	0,1	9004-32-4

[20] The percentages (%) in this table refer to technical products representing the ingredients but not to the active substance.
[21] The content (%) of zeolite is calculated as = 82% - ΣContent of all other ingredients except zeolites. In other words, adding zeolite until the 82% is reached. In this table, the 0.2% of the Optical whitener for cotton (stilbene type) present in the EN60456:2023 (A12) original ICP-P standard powder detergent has been replaced by zeolites.

	phosphonate (25% Diethylenetriamine penta(methylene phosphonic ~~active~~ acid)	3.0 ~~3,6~~	0.3 ~~0,2~~	22042-96-2
	protease (Savinase X.0 T)	64 KNPU/Kg* ~~0,5~~	6.4 KNPU/Kg* ~~0,5~~	9014-01-1
	Amylase (Stainzyme X.0 T)	24 SNUX/Kg*	2.4 SNUX/Kg*	9000-90-2
	Mannanase (Mannaway X.0 T)	4 MIU/Kg*	0.4 MIU/Kg*	37288-54-3
	Lipase (Lipex X.0 T)	100 KLU/Kg*	10 KLU/Kg*	9001-62-1
	Cellulase (Celluclean X.0 T)	2300 CNU/Kg*	230 CNU/Kg*	9012-54-8
	sodium sulfate	6.9 ~~rest~~	0.7 ~~rest~~	7757-82-6

*Enzyme activity units – e.g. KNPU/kg = Kilo Novo Protease Units per gram of sample.

Homogenize powder detergent, better with a sample divider or if not shake the detergent gently.
The ingredients shall be mixed prior to use. The maximum storage time after mixing is 7 days
Dosage for powder HDD: 70g IEC P BASE + 12.5g sodium percarbonate (CAS 15630-89-4) + 2.5g TAED (CAS 10543-57-4)
Dosage for liquid HDD: 70g IEC P BASE

LDD

Ingredient	% technical grade	Tolerance (+/-)	CAS n.
fatty alcohol ethoxylate $C_{12/14}$ (EO=7)[a]	35	0,5	68213-23-0
low foaming fatty alcohol $C_{12/14}$ with approx 4mol EO and approx 5 moles PO (ethyleneoxide/higher alkylene oxide -co-polymer)[b]	15	0,3	68439-51-0
sodium dodecyl sulfonate[c]	7,5	0,2	68411-30-3
modified polycarboxylate (suitable for liquid detergents)[d]	15	0,3	
ethanol	5	0,1	64-17-5
distilled water add to 100%	rest		

Manufacturing process:

1. Mix fatty alcohol ethoxylate C12/14 (EO=7) and sodium dodecyl sulfonate heating to 40 °C
2. When the mixture will be homogenized, add low foaming fatty alcohol ethoxylate. Mix and homogenize
3. Add ethanol
4. Add modified polycarboxylate and mix
5. Finally, add water (until 100%)

The bottle shall be agitated before use
Dosage, power or liquid LDD: 35ml/wash cycle

CSD

Reformulation of the IEC P BASE reference detergent according to IEC 60456 formulation

Dosage: 70g IEC P BASE + 1ml PVP (PVP VI, Sokolan HP 56 K)

[a] example: dehydol LT-7 (BASF)
[b] example: dehypon LS 45 (BASF)
[c] example: maranil paste A55 (BASF)
[d] example: sokalan HP 25 (BASF)

3.12. Number of cycles

A set of 15 washing machine cycles for the determination of:

- stain removal testing from cycle nr 6 to cycle nr 11- final Y-value (HDD/CSD/LDD)
- basic degree of whiteness- final Y-value (HDD/CSD/LDD)

A separate set of 15 additional cycles, run separately for colour maintenance CSD and HDD/LDD (only in the case that colour care is claimed),

Grey scale determination.

Dye transfer inhibition: for CSD and HDD/LDD (only in the case that colour care is claimed), 3 replicates with new dyes donators and acceptors in each wash. Grey scale determination.

Table 14. Cycles for each type of products

	Colour claim	Stain removal	Basic degree of whiteness	Colour maintenance	DTI
HDD	Yes	✓	✓	✓	✓
	No	✓	✓	×	×
CSD		✓	✓	✓	✓
LDD	Yes	✓	✓	✓	✓
	No	✓	✓	×	×

3.13. Wash programme

Table 15 shows the different wash programmes for the Ecolabel performance test.

With low temperature and cold-water wash products, the washing performance will be determined at the lowest stated temperature at which the detergent is claimed to be effective. The reference detergent should be tested at 30 °C.

Table 15. Different wash programs

Test product	Temp efficient	Wash programme test product	Wash programme reference detergent	Water inlet temperature test product	Water inlet temperature reference detergent	Heating Element*
HDD/ CSD	30 °C	30 °C, normal cotton program, 1200rpm	30 °C , normal cotton program, 1200rpm	20,0 ± 4,0 °C	20,0 ± 4,0 °C	on
HDD/ CSD	20 °C	20 °C, normal cotton program, 1200rpm	30 °C, normal cotton program, 1200rpm	20,0 ± 4,0 °C	20,0 ± 4,0 °C	on
HDD/ CSD	X ~~15~~** °C	20 °C, normal cotton program, 1200rpm	30 °C, normal cotton program, 1200rpm	X ~~15,0~~** ± 4,0 °C	20,0 ± 4,0 °C	off
LDD	30 °C	30 °C, delicate program, 600rpm	30 °C, delicate program, 600rpm	20,0 ± 4,0 °C	20,0 ± 4,0 °C	on
LDD	20 °C	20 °C, delicate program, 600rpm	30 °C, delicate program, 600rpm	20,0 ± 4,0 °C	20,0 ± 4,0 °C	on
LDD	15 °C	20 °C, delicate program, 600rpm	30 °C, delicate program, 600rpm	15,0 ± 4,0 °C	20,0 ± 4,0 °C	off

* of the washing machine of the test product

** As per water inlet minimum temperature.

3.14. Pre-treatment

- Pre-treatment of ballast load (cotton and polyester) and standard cotton fabric for HDD/CSD or LDD should be done in 3 washes at 60 °C, normal cotton programme without pre-wash.

Use the Colour fastness Establishment (ECE) reference ~~standard~~ detergent 98 (non-phosphate basic powder, optical brightener-free)[22] conforming ISO 6330:2021~~, of the European Colour fastness Establishment (ECE) for colour fastness (ISO 6330) of~~ with a dosage of 21.25 g EC 98/kg load ~~85g per 4,0 kg load is used (~~ equivalent to 95,63 g of detergent ~~per~~ for a 4,5 kg load~~).~~

It is recommended to dry ballast load after pre-treatment.

3.15. Drying and flattening

Do not iron or dry in tumble drier~~ying for all textiles~~ test fabrics.

~~Stains removal monitor: ironing after the wash cycle at 2 points (150 °C) without steam except for those whose colour will be affected (e.g. blood and tomato).~~

Standard cotton cloths: line drying at the end of the day~~, no ironing~~.

AISE 14 monitor dyes: line drying at the end of the day ~~– no ironing~~.

4. Methods

4.1. Stain removal and basic degree of whiteness by using a spectrophotometer

4.1.1 Test procedure

The monitors used for the evaluation of the stain removal, must be chosen from the same production lot.

The appropriate amount is stored at low temperatures (according to the suppliers' recommendations) under the exclusion of light and oxygen. The material is cut into pieces of (12x12) or (5x5) cm and stored until ready for use in the dark and cold.

Two test monitors of each kind are used for every single wash and fixed on different huckaback towel carrier fabrics with the marked right side upwards.

An extra set of four carrier fabrics will be used for the next wash cycle in order to dry the first set in the meantime.

The prepared carrier fabric with the test swatches are evenly distributed in the wash load and washed in the respective programme parallel to washes at the same conditions using the reference detergent. After one wash, they are removed from the machine and~~. Afterwards the monitors remain~~ they should ~~preferably~~ remain on the carrier~~, but they can also be removed from the carrier, and then ironed (2 points, 150 °C without steam) after each wash cycle~~.

For stain removal, the whole procedure is repeated 6 times (for HDD/CSD and LDD washes 6 to 11).

The cotton fabrics used for the evaluation of basic degree of whiteness must be from the same production lot. The appropriate amount is stored according to the suppliers' recommendations, under exclusion of light and oxygen.

Two tests fabrics will be used for all the cycles (15 cycles).

[22] Equivalent to wfk 88031, formula 1998 ISO 105-C08

316

317 4.1.2 Reflectance measurement

318 Final Y-value measurement for stain removal and basic degree of whiteness, and stain
319 removers determination can be described as follows:

320 - Measuring geometry: d/8°
321 - D65/10° observer
322 - With UV-filter (420nm cut off)
323 - Measuring diameter: Minimum 20 mm
324 - Gloss: without
325 - Calibration: Measurements shall be carried out at the latest 8h after calibration with
326 white tile and black trap

327 For each standard stain (12x12cm or 5x5cm) the mean of the 48 measurements (2 samples
328 per soil x 4 readings x 6 wash cycles) is calculated. Standard deviation ought to be calculated
329 from 6 washes.

330 For each natural stain (5 cm of diameter) the mean of the 24 measurements (2 samples per
331 soil x 2 readings x 6 wash cycles) is calculated.

332 For each white cotton cloth the mean of 8 initial measurements (before first cycle) and 8
333 final measurements (after 15 cycles) is calculated (2 samples x 4 readings). It is necessary
334 to bend the cotton cloth before starting with the measurements.

335

336 *4.2. Colour maintenance by using a spectrophotometer*

337 Defined colour maintenance monitor (AISE 14 monitor dye set) (see

338

339 **Table 8**) and ballast load (see Table 2).

340 After 15 wash cycles the samples are measured using a spectrophotometer on a defined
341 white background[23] at four defined spots. For all products in comparison a common
342 calibration is used. The wash temperature shall be 30°C. The measurement for the colour
343 maintenance test will be done according to EN ISO 105-J01:2000 "*Textiles. Tests for colour*
344 *fastness, general principles for measurement of surfaced colour".* The measurement
345 conditions will be as follows:

346 - Measuring geometry: d/8°
347 - D65/10° observer
348 - With UV-filter (420 nm cut off)
349 - Measuring diameter: minimum 20 mm
350 - Gloss: without
351 - Calibration: measurements shall be carried out at the latest 8h after calibration with
352 white tile and black trap
353 - Results must be reported as "grey scale" figures

354 The colour differences are calculated according to EN ISO 105-J03: 2009 "*Textiles. Test of*
355 *colour fastness. Calculation of colour differences*". The initial state of the colour is taken as a
356 reference for determining the colour differences, the change in colour is instrumentally
357 assessed as described in EN ISO 105-A05:1997 "*Textiles. Test of colour fastness.*

[23] A defined white background means the white background used by the laboratory. It should be the same for each measurement

Instrumental assessment of change of colour for determination of grey scale rating". Mean and standard deviation for each dye is calculated. Mean over the complete dye set is calculated. They are based on EN 20105-A02: 1993~~5~~ "*Textiles. Test of colour fastness. Grey scale for assessing change in colour".*

4.3. Dye transfer inhibition by using a spectrophotometer

Laundering device: Linitest (preferred) or Tergotometer.

The laundering device is described in EN ISO 105:C061997 "*Textiles. Test of colour fastness. Colour fastness to domestic and commercial laundering".* A water bath containing a routable shaft which supports, radially stainless steel containers (diameter 7,.5 ± 0,.5 cm, height 12.,0 ± 0,.5 cm) with 525 ± 50 ml capacity each), the bottom of the containers is being 4.5 ± 1 cm from the centre of the shaft. The shaft/container assembly is rotated at a frequency of 40 ± 2 rpm. The temperature of the water bath is thermostatically controlled to maintain the test solution at the prescribed temperature ±2 °C.

The same liquor concentration and water hardness is used as in the washing machine. The product in test (amount for 1l) is dispersed in 1l of lukewarm water using a magnetic stirrer and then rapidly heated until the liquor reaches 40 °C.

Dye donator (0.3 g) and dye accepter (cotton and polyamide) are placed in the container (no addition of steel balls). Both textiles are not fixed to each other. The volume to give the correct liquor: fabric ratio 100:1 is added and the containers are placed in the preheated (40 °C) machine. Temperature raises 2 °C up to 60 °C and the wash is continued for 20 min at this temperature.

Table 16. DTI wash cycle composition (detergent: CSD (powder and liquid) /LDD

Cycle nr	1	2	3
Composition	Cotton + polyamide donator		

Both dye acceptors (CO and PA) are used for all 4 dye donators.

After washes the textiles are removed and rinsed twice for 1 min in running warm water and then in cold running water for 10 min (same hardness as the test). Textiles are dried hanging in the air (no direct sun)

To assess the dye transfer after one wash, colour differences between the standard cotton or polyamide piece washed without and with dye donator is determined by using a spectrophotometer.

Results must be reported as "grey scale" figures. The colour differences are calculated according to EN ISO 105-J03: 2009 "*Textiles. Test for colour fastness. Calculation of colour differences*". Measurements are taken at two defined areas of the dye acceptor using an appropriate device as described in CIE 15:2004 "colorimetry".

The instrumental assessments on colour fastness are done according to EN ISO 105-A04:1997 "*Textiles. Method for the instrumental assessment of the degree of staining of adjacent fabrics*". They are based on EN 20105-A03:1995 "*Textiles. Test for colour fastness. Grey scale for assessing staining".* The measurement for all products to be compared is performed using one common calibration under the same conditions.

- Measuring geometry: d/8°
- D65/10° observer

- With UV-filter (420nm cut off)
- Measuring diameter: minimum 20 mm
- Gloss: without
- Calibration: measurements shall be carried out at the latest 8h after calibration with white tile and black trap

4.4. Testing of stain removal, basic degree of whiteness, colour maintenance and dye transfer inhibition by using a multi-image analysis device.

A multi-image analysis or alternative device can be used to perform the above mentioned analyses~~.~~ if the laboratory certifies similar outputs as to those using ~~The multi-image analysis device should give similar output as~~ a spectrophotometer.

5. Evaluation

Each product must achieve the following results

5.1. Stain removal

Each product category (HDD, CSD, LDD) follows the same procedure

All the stains must be evaluated separately (Y-final) and referred to the reference detergent and the statistical influence (σ) must be taken into account (3 failures are allowed)

$$\Delta Y = (\text{average reference} - \sigma) - (\text{average product} + \sigma)$$

$$\Delta Y \leq 10 \text{ to pass the test}$$

5.2. Basic degree of whiteness

Each product category (HDD, CSD, LDD) follows the same procedure.

$$\Delta Y = (\text{average reference} - \text{average product})$$

The product passes the test if:

- For HDD powder products: $\Delta Y < 2{,}0$
- For HDD liquid and CSD (powder and liquid) products: $\Delta Y < 3{,}0$
- For LDD products: $\Delta Y < 2{,}0$

5.3. Colour maintenance

Each product category (CSD and HDD/LDD) follows the same procedure.

All dyes must be evaluated separately and referred to reference detergent. The colour maintenance is measured as

$$(\Delta \text{ grey scale}) = \text{average reference} - \text{average product}$$

Each product category must achieve: Δ grey scale $\leq 1{,}0$ to pass the test (2 failures are allowed)

5.4. Dye transfer inhibition (DTI)

Each product category (CSD and HDD/LDD) follows the same procedure.

Each DTI data must be evaluated separately and compared to the reference detergent. The dye transfer inhibition is measured as

$$(\Delta \text{ grey scale}) = \text{average reference} - \text{average product}$$

Each product category must achieve: Δ grey scale $\leq 1{,}0$ to pass the test (1 failure is allowed on maximum 1 (out of 4) dye)

See Annex 1 for a complete example.

6. Results and reporting

An excelsheet template can be found on the EU Ecolabel website to report the data of the performance test of laundry detergents. The filled in template together with the requirements of the laboratory to conduct the performance test shall be provided by the applicant.

Annex 1. Example CSD liquid and template example

A template for reporting the description of the procedures and the results of the tests is available here XXXX ~~(http://ec.europa.eu/environment/ecolabel/documents/performance%20test%20LD.xlsx).~~ This template is not mandatory to show compliance with criterion X Fitness for use

[LD] Revised EU Ecolabel protocol for testing stain removers[24]

Content

Abbreviations

HDD	Heavy duty detergent	DTI	Dye transfer inhibition
CSD	Colour safe detergent	SBL	Soil ballast load
LDD	Light duty detergent	PC	Sodium percarbonate
SR	Stain removal	TAED	Tetra acetyl ethylene diamine
BDW	Basic degree of whiteness	PVP	Polyvinylpyrrolidone
CM	Colour maintenance	CO	Cotton
PA	Polyamide	PES	Polyester
PES/CO	Polyester/cotton	WO	Wool
SI	Silk	AISE	International Association for Soaps, Detergents and Maintenance Products

Disclaimer

Note that throughout this protocol there might be mention to specific commercial products, brands and/or machine model/s which, unless otherwise explicitly indicated, are given for the convenience of users of this document, thus not constituting any endorsement of such product/s named. Also, note that equivalent products might be commercially available after de date of publication of this protocol under different names/codes.

0. Background

This test protocol serves as a proof to show compliance with the criterion "fitness for use" of the Commission Decision (EU) ~~2017/1218 of 23 June 2017~~ XXXX/YYYY[25] establishing EU Ecolabel criteria for Laundry detergents. The product shall be fit for use, meeting the needs of consumers.

The test is for products that fall under the scope of the product group "Laundry detergents" as "pre-treatment stain removers" which means stain removers used for direct spot treatment of textiles before washing in the washing machine but do not include stain

[24] Not for industrial and institutional products
[25] To be added the Commission Decision number once adopted

removers dosed in the washing machine and stain removers dedicated to other uses besides pre-treatment. This means, this protocol focuses on stain removers as specified in the section 3.1 "Range of application".

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

In addition to the performance test, it is the responsibility of the applicant to ensure that the product is safe to use on the intended use.

1. Test criteria

The intention is that the test should show that stain removers make a positive contribution to the washing result. This is achieved by performing a wash test for the standard reference detergent and comparing this result with the result of an equivalent wash test for the standard reference detergent with a stain remover added. The wash test shall be passed for all soil types that the product is claimed to have an effect on. If no specific types of soils are specified on the product at least five different soils must be tested and the reasons for the choice of these soils must be stated.

2. Laboratory requirements to conduct the testing.

The manufacturer's test laboratory or/and an external test laboratory can be approved to conduct testing to document effectiveness of stain removers if the following requirements are met:

- it must be possible for EU Ecolabel competent bodies to monitor the performance of testing (e.g. on-site visits to the laboratory),
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets),
- whenever possible, the samples must be made anonymous for the test laboratory (e.g. product A and product B).
- the test laboratories must be equipped with the devices described in the test method,
- performance of the effectiveness test as well as the test method must be described in the quality control system.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council

3. Materials and conditions

The test institute must be able to prove the compliance with all test conditions laid down in the following paragraphs. The documentation of the compliance with all test conditions shall be part of the test report (section 6 Results and reporting).

3.1. Range of application:

In the context of the EU Ecolabel, this performance test can be applied to stain removers for clothing, for soaking as a wash enhancer or for pre-washes or other equivalent functions. Pre-treatment stain removers include stain removers used for direct spot treatment of textiles (before washing in the machine) but don't include stain removers dosed in the washing machine and stain remover dedicated to other uses besides pre-treatment.

3.2. Washing machine types:

Programmable electronic ~~Miele~~ household washing machines with stable performance / guaranteed reproducibility across models / washes, capable of disabling fuzzy logic (e.g. Miele WCI 360 WPS WTL[26]) are eligible. Aiming to ensure equal testing conditions across washing machine models, water and energy consumption shall be monitored and recorded. They shall be calibrated and validated, at the minimum, every year.

Fuzzy logic type control shall be disabled and washing machines shall ~~which~~ fulfil the following requirements:

Table 17. Washing machine and wash programmes specifications

	Cotton wash program (at 30 °C, 20 °C[~~a~~], 15 °C[~~ab~~])	Delicate/Synthetic program[~~c~~] (at 30 °C, 20 °C[a], 15 °C[b])
Duration main wash	50-70 min	30-40 min
Total program duration	100-120 min	55-65 min
Water quantity main wash	10~~5~~±2 l	20±2 l
Total water quantity	55±5 l	64±5 l
Number of rinse cycles	3	3
Final spin speed	1200rpm[27]	600rpm

[~~a~~] ~~for cold water products~~

[~~ab~~] most of the older machines do not offer cold water programs. Those machines which offer cold water programmes normally heat up the entering water to 21 °C, which can be used for products that claim to be effective at 20 °C ("cold water products"). For test runs at 15 °C the heating elements of the washing machine have to be disconnected to prevent the heat up

[~~c~~] ~~some newer washing machines offer an equivalent synthetic program~~

3.3. Water conditions:

Water hardness: 2,5 ± 0,2mmol $CaCO_3$/l (equivalent to 14.0 ± 1.12°d). The Ca/Mg ration will be 3 ± 0,5

Water inlet temperature: 20,0 ± 4,0 °C, but not for those product that claim to be effective at lower temperature. The water inlet temperature for products which are effective at lower temperature shall be 15,0 ± 4 °C

The amount of water shall be controlled along the washing process, if possible.

The water hardness and the water inlet temperature shall be reported for the test product and reference detergent or stain removal.

[26] WCI 360 WPS WTL is the trade name of a product supplied and/or manufactured by Miele Equivalent products may be used if they can be shown to lead to the same results. ~~Miele machine was proposed as a reference machine due to its stable performance and regular quality of the outcomes.~~
~~For use in laboratories, Miele launched a special line of machines where the fuzzy logic can be disabled (e.g. Miele WCI 360 WPS WTL).~~
~~Another machine could be used as reference machine if it provides similar performance for a comparable programme.~~

[27] See footnote 2

3.4. Ballast load:

Cotton ballast load: the base load of cotton shall consist of cotton pillowcases and cotton huckaback hand-towels conforming standard IEC 60456[Error! Bookmark not defined.].

3.5. Stains sets

For non-specific products, the product must be tested on a minimum of five different stains. If the product claims a specific effect, the product must be tested on a minimum of five stains of the product claim[28]. In any case, the reason for the choice of the stains must be given to the competent body (Section 6 Results and reporting).

Two sets of stains per wash cycle (in the same batch) should be used. Mark with a water resistant pen each stain as the Figure 1. Fix the stains on the loads with a plastic staple with a gun on the load, as the example in Figure 2. Alternatively, the stains can be stitched together beforehand to make a full test strip or use a multiswatch monitor[14]. Then, this strip must be fixed on a hand towel before washing.

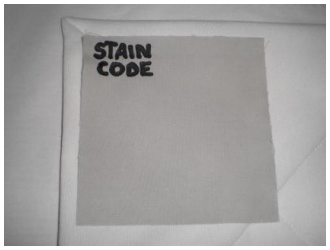

Figure 1 Marking of the stain sets

Figure 2 Marking of the stain sets

Figure 3 Marking of the stain sets

Figure 1-3. Marking of the stain sets

Table 18. Information on the different stains and suppliers

Stains	Fabric	Standard stains			Hand made[29]	Type
Carbon black/ olive oil	CO	EMPA 101		CFT C-02	125KC	Greasy
	PES/ CO	EMPA 104		CFT PC-02	125PC	
	WO	EMPA 107		CFT W-02		
	PE			CTF P-02	125PE	
Carbon black/ mineral oil	CO	EMPA 106	WFK 10M	CFT C-01		Greasy
	PES/ CO		WFK 20M	CFT PC-02		
	PES		WFK 30M	CFT P-02		

[28] For example, if the stain remover claims to be effective in removing greasy stains, stains must be chosen from the following list: carbon black/olive oil, carbon black/mineral oil, sebum/pigment, lipstick, make-up, pigment/lanolin, pigment/olive oil
[29] The handmade stains are produced by Lubrizol

Blood	CO	EMPA 111	WFK 10PBU WFK 90PBU		109KC	Enzymatic
	PES/ CO		WFK 20PBU		109PC	
	PES		WFK 30PBU		109PE	
Aged blood	CO		WFK 10PB	CFT C-S-01		Enzymatic
	PES/ CO		WFK 20PB	CFT PC-S-01		
	PES		WFK 30PB	CFT P-S-01		
Cocoa	CO		WFK 10MF WFK 90MF	CFT CS-02		Enzymatic
	PES/ CO		WFK 20MF	CFT PC-S-02		
	PES		WFK 30MF	CFT P-S-02		
Red wine	CO	EMPA 114	WFK 10LIU WFK 90LIU	CFT C-S-103	126KC	Bleachable
	PES/ CO		WFK 20LIU	CFT PC-S-103	126PC	
	PES		WFK 30LIU	CFT P-S-103	126PE	
	WO		WFK 60LIU	CFT W-S-103		
	SI		WFK 70LIU	CFT S-S-103		
Aged red wine	CO	EMPA 122	WFK 10LI WFK 90LI	CFT CS-03		Bleachable
	PES/CO		WFK 20LI	CFT PC-S-03		
	PES		WFK 30LI	CFT P-S-03		
	WO		WFK 60LI	CFT W-S-03		
	SI		WFK 70LIU	CFT S-S-03		
Blood/milk/ink	CO	EMPA 116		CFT C-05		Enzymatic
	PES/ CO	EMPA 117		CFT PC-05		
	PES			CFT P-05		
Sebum/pigment	CO	EMPA 118	WFK 10D WFK 90D	CFT C-S-132		Greasy
	PES/CO	EMPA 119	WFK 20D	CFT PC-S-132		
	PES		WFK 30D	CFT P-S-132		
	WO		WFK 60D	CFT W-S-132		
	SI		WFK 70D	CFT S-S-132		
Lipstick	CO	EMPA 141/1 EMPA 141/2 EMPA 141/3	WFK 10LS	CFT C-S-216 CFT CS-116	073KC	Greasy Particulate
	PES/ CO	EMPA 142/1 EMPA 142/2 EMPA 142/3	WFK 20LS	CFT PC-S-216 CFT PC-S-116	073PC	
	PES		WFK 30LS	CFT P-S-216 CFT P-S-116	073PE	
	WO		WFK 60LS	CFT W-S-216 CFT W-S-116		
	SI		WFK 70LS	CFT S-S-216 CFT S-S-116		
Make up	CO	EMPA 143/1 EMPA 143/2 EMPA 143/3	WFK 10MU	CFT C-S-17	075KC	Greasy Particulate
	PES/ CO	EMPA 144/1 EMPA 144/2 EMPA 144/3	WFK 20MU	CFT PC-S-17	075PC	

	PES		WFK 30MU	CFT P-S-17	075PE	
	WO		WFK 60MU	CFT W-S-17		
	SI		WFK 70MU	CFT S-S-17		
Chocolate cream	CO	EMPA 160		CFT C-S-68	CFT KC-H009	Enzymatic
Chocolate	CO		WFK 10Z	CFT C-S-44	033KC	Enzymatic
	PES/CO		WFK 20Z	CFT PC-S-44	033PC	
	PES		WFK 30Z	CFT P-S-44	033PE	
	WO		WFK 60Z	CFT W-S-44		
	SI		WFK 70Z	CFT S-S-44		
Cocoa, not temperature treated	CO	EMPA 112	WFK 10MFU WFK 90MFU		038KC	Enzymatic
	PES/CO		WFK 20MFU		038PC	
	PES		WFK 30MFU		038PE	
Corn starch	CO	EMPA 161	WFK 10R	CFT C-S-26		Enzymatic
	PES/CO	EMPA 162	WFK 20R	CFT PC-S-26		
	PES		WFK 30R	CFT P-S-26		
Potato starch	CO			CFT C-S-27		Enzymatic
	PES/CO			CFT PC-S-27		
	PES			CFT P-S-27		
Rice starch	CO			CFT C-S-28	CFT KC-H161	Enzymatic
	PES/ CO			CFT PC-S-28	CFT PC-H161	
	PES			CFT P-S-28	CFT P-H161	
Porridge	CO	EMPA 163			097KC	Enzymatic
Grass	CO	EMPA 164		CFT C-S-08	062KC	Bleachable Enzymatic
	PES/ CO			CFT PC-S-08	062PC	
	PES			CFT P-S-08	062PE	
Pudding (mananase sensitive)	CO	EMPA 165		CFT C-S-69	CFT C-H118	Enzymatic
Tea (responsive to bleach only due to special treatment)	CO			CFT C*BC-03	117KC	Bleachable
	PES/CO			CFT PC-BC-03	117PC	
	PES			CFT P-BC-03	117PE	
	SI					
Tea	CO	EMPA 167	WFK 10J	CFT C-S-97		Bleachable
	PES/ CO	EMPA 168	WFK 20J	CFT PC-S-97		
	PES		WFK 30J	CFT P-S-97		
Pigment/ lanolin	CO		WFK 10C			Greasy
	PES/ CO		WFK 20C			
	PES		WFK 30C			
	WO		WFK 60C			
	SI		WFK 70C			
Pigment/olive oil	CO		WFK 10B		125KC	Greasy
	PES/CO		WFK 20B		125PC	
	PES		WFK 30B		125PE	
	WO		WFK 60B			
	SI		WFK 70B			

3.6. Stains set size

(12x12) cm^2, (5x5) cm^2 standard stains and colour maintenance and 5 cm diameter (hand-made).

3.7. Soil

Introduce 4 sheets of Soil Ballast Load (SBL) SBL 2004[30] or SBL-CFT[31] per wash. Fix the SBL sheets on the loads as the stains.

3.8. Wash loads

Each test series has to be started with a new wash load. This load consists of:

1. A new all cotton ballast load for the normal cotton wash program to reach a total weight of 4,5 kg.

Table 19. Total cotton loads (kg)

Total load (kg)	Pillowcases	Hand-towel
4,5 kg ±0,1kg	12 units	Until weight

2. 5 stain removal monitors x 2 replicates
3. 4 pieces of soil ballast

The total load per wash including ballast load, SBL, cotton cloth and monitors will be 4,5 ±0,1 kg.

3.9. Pre-treatment of cotton hand towels and ballast load

3 washes at 60 °C, normal cotton program without pre-wash. The basic powder, optical brightener-free, of ECE-2 standard detergent for colour fastness (ISO 6330) of a dosage of 85g per 4,0 kg load is used (95,6 g of detergent per 4,5 kg load)

It is recommended to dry ballast load after pre-treatment. A standard dryer can be used.

3.10. Reference detergent

Table 20. Reference detergent

Regular standard powder detergent IEC P (that can serve as reference for a detergent to wash white fabrics). This standard detergent is distributed as three separate components (because of stability of storage) with the following composition:

- 82% IEC P BASE powder with enzyme and foam inhibitor (= IEC A* BASE, see table below)
-15% sodium percarbonate
- 3% bleach activator tetra-acetylethylenediamine (TAED)

[30] The supplier of SBL 2004 is WFK (http://www.testgewebe.de).
[31] The supplier of SBL-CFT is CFT (https://www.cftbv.nl/)

Ingredient	% content	Tolerance (+/-)	CAS n.
linear sodium alkyl benzene sulfonate	11,4	0,5	25155-30-0
ethoxylated fatty alcohol $C_{12/14}$ (7EO)	6,1	0,3	68439-50-9
sodium soap (tallow soap)	4,2	0,2	308075-99-2
foam inhibitor concentrate, 12% silicon on inorganic carrier)	5,1	0,3	68989-22-0
sodium aluminium silicate zeolite 4A (80% active substance)	36,7	1	70955-01-0
sodium carbonate	15,1	1	497-19-8
sodium salt of a copolymer from acrylic and maleic acid (sokalan CP5)	3,1	0,2	60472-42-6
sodium silicate (SiO_2:Na_2O = 3.3:1)	3,9	0,2	1344-09-8
carboxymethylcellulose	1,6	0,1	9004-32-4
phosphonate (25% active acid)	3,6	0,2	22042-96-2
protease	0,5	0,5	9014-01-1
sodium sulfate	rest	rest	7757-82-6

The ingredients shall be mixed prior to use. The maximum storage time after mixing is 7 days.

Dosage HDD: 70g IEC P BASE + 12.5g sodium percarbonate + 2.5g TAED

Put detergent in dispenser machine device.

3.11. Test product for stain removers

The test product consists of a reference detergent with a stain remover added. The reference detergent is dosed as in 3.10. The stain remover is dosed according to the instructions provided on the product and taking onto account consumer habits.

3.12. Wash programme

30 °C, cotton normal program and final spin 1200rpm.

3.13. Procedures

- Pre-treatment of cotton and hand-towels and ballast load according to section 3.9.

- Washing: The following wash cycles are run, at least, 6 times with each product, using a new set of stains each time. For all the different products in

Table 21, 5x2 different stains (according to 2.5) must be tested and 2 standard cotton cloths in the same wash (according to 2.8)

Table 21. Washing conditions

Product	**Conditions**

Stain remover + reference detergent	In this case the stain remover following the recommendations from the producer and wash adding 70g IEC P BASE + 12.5g sodium percarbonate + 2.5g TAED (Table **20**)
Reference detergent	In this case wash adding only 70g IEC P BASE + 12.5g sodium percarbonate + 2.5g TAED (Table **20**)
Water	Wash without chemical products (detergents and additives)

- Drying (no tumble drying) and flattering: 2 points (150 °C) without steam after each wash cycle just the stains

4. Methods

4.1. Test procedure

The stain sets monitors used for the evaluation must be from the same production lot. The appropriate amount is stored at low temperatures (according to the recommendations of the suppliers) under exclusion of light and oxygen. The material is cut into pieces of 12x12cm and stored until ready to use in the dark and cold.

Two test monitors of each kind are used for every single wash and fixed on different huckaback towel carrier fabrics with the marked right side upwards.

An extra set of four carrier fabrics will be used for the next wash cycle in order to dry the first set in the meantime.

The prepared carrier fabric with the test swatches are evenly distributed in the wash load and washed in the run programme while to washes at the same conditions using the reference detergent. After one wash they are removed from the machine. Afterwards the monitors are removed from the carrier and dried in the dark at ambient conditions lying flat on a sieve.

For the test, the whole procedure is repeated 6 times.

4.2. Reflectance measurement

Final Y-value measurement for stain removal determination can be described as follows:

- Measuring geometry: d/8°
- D65/10° observer
- With UV-filter (420 nm cut off)
- Measuring diameter: minimum 20 mm
- Gloss: without
- Calibration: measurements shall be carried out at the latest 8h after calibration with white tile and black trap

For each soil monitor the mean of the 48 measurements (2 samples per soil x 4 readings x 6 wash cycles) are calculated. Standard deviation ought to be calculated from 6 washes.

The mean value (Y) for the above measurements is taken for each stain test. The normalized wash result is achieved by subtracting the result for water from both the reference detergent and the test product.

5. Evaluation

The product will be considered to have a satisfactory performance, at temperature tested, if it achieves the following results:

The general normalized cleaning effect must be greater than 110% compared to the reference detergent and the result for all soil types must be better than for water.

6. Results and reporting

An excelsheet template can be found on the EU Ecolabel website to report the data of the performance test of laundry detergents. The filled in template together with the requirements of the laboratory to conduct the performance test shall be provided by the applicant.

Annex 1: Examples for reporting

A template for reporting the description of the procedures and the results of the tests is available here XXXX ~~(http://ec.europa.eu/environment/ecolabel/documents/performance%20test%20LD.xlsx~~). This template is not mandatory to show compliance with criterion X Fitness for use

[IILD] Framework for testing performance for industrial and institutional laundry detergents

Content

Disclaimer

Note that throughout this protocol there might be mention to specific commercial products, brands and/or machine model/s which, unless otherwise explicitly indicated, are given for the convenience of users of this document, thus not constituting any endorsement of such product/s named. Also, note that equivalent products might be commercially available after de date of publication of this protocol under different names/codes.

0. Background

This test protocol serves as a proof to show compliance with the criterion "Fitness for use" of the Commission Decision ~~2017/1219~~ XXXX/YYYY[32] establishing EU Ecolabel criteria for "Industrial and Institutional Laundry Detergents".

The test is for products that fall under the scope of the product group "Industrial and Institutional Laundry Detergents". This means laundry detergents designed to be used by specialised personnel in industrial and institutional facilities and multi-component systems constituted of more than one component used to build up a complete detergent or a laundering program for an automatic dosing system.

The test is passed when a product shows equal or better performance ("effectiveness") than that of the reference product. The performance test can be conducted through a laboratory test or a user test and applies to mono- and multi-component products.

~~In addition to the performance test, it is the responsibility of the applicant to ensure that the detergent is safe to use on the intended use.~~ At the minimum, both type of test shall:

- be tested according to manufacturer's recommendations, as displayed in the product (e.g. label) or accompanying product sheet, specifically:
    - for normally soiled load (medium degree of soiling)
    - at the lowest washing temperature and;
    - at the highest water hardness and;
    - at the recommended dosage considering the former aspects (if range is provided, the lower end of it)

[32] To be added the Commission Decision number once adopted

- Shall have defined in advance its elements and stages, which must be identical for each repetition (e.g. soiling process; method of analysis) unless testing conditions can be justified as being not identical but comparable.

~~The~~ Further conditions for both types of test are described in the following sections.

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

In addition to the performance test, it is the responsibility of the applicant to ensure that the ~~detergent~~ product is safe to use on the intended use.

1. Laboratory test

~~The laboratory test may be conducted by an external or internal laboratory, as long as it fulfils the requirements set out in Section 1.1. The test must be conducted: with the recommended dosage (, at the lowest recommended washing temperature, and with the highest water hardness at which the product may be used, per manufacturer specifications.~~

1.1. Laboratory requirements

The manufacturer's test laboratory or an external laboratory can be approved to conduct testing to document effectiveness of industrial and institutional laundry detergents if the following requirements are met:

- it must be possible for competent bodies to monitor the performance of testing (e.g. on-site visits to the laboratory),
- the testing should be performed preferentially by laboratories that meet the general requirements of EN ISO 17025 or equivalent,
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets),
- whenever possible the samples must be made anonymous for the test laboratory (e.g. product A and product B).
- performance of the effectiveness test as well as the test method must be described in the quality control system.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council.

1.2. Testing conditions

~~The measurements must be performed on unlaundered and laundered test clothes. Evaluation of the test results shall be made by the laboratory and shall be clearly explained in the report.~~

At least 5 repetitions shall be made for each test product and each reference product (generic formulation or market product) used

The ~~T~~test should be carried out to the extent feasible under realistic conditions, which amongst other aspects implies using ~~regarding~~ representative soiling[33] and temperature profiles relevant to the intended uses, function/s and/or industrial sector/s of the test product (i.e. product category). Possible

33 Most used testing materials/soils in the institutional and industrial laundry detergents are: mineral oil (representing the industry), wine and cocoa (representing food/restaurants), sebum (representing body oils/hotels/hospitals), blood (representing hotels) and sometimes cosmetics (representing hotels)

examples of soiling can be PCMS-55 with 13 soils or Mon-AISE A[34]+B[35] with 14 swatches. If appropriate, the normal soiling for testing laundry detergents[36] (e.g. soil ballast load SBL 2004 or SBL-CFT, i.e. 4 units per 4,5 kg load) must be used.

Realistic conditions also implies the use of machines/models that have predictive value/correlation towards real usage conditions results. In this sense and for washing conditions, the test shall be performed with machines meeting the specifications of ISO 15797:2017[37] (See Table 1). Alternative machine specification could be accepted conditioned to the approval of the Competent Body after presenting a justification on its equivalency with ISO 15797:2017 or its suitability to generate predictive values correlated towards realistic washing conditions.

Table 1 – Washer/extractor specifications in ISO 15797:2017[38].

Aspect	Description
Type	Front- or side-loading open pocket horizontal rotating drum type
Cage volume	220 l to 250 l
Diameter of cage	750 mm to 850 mm
Depth of cage	400 mm to 600 mm
Ratio (diameter of cage to depth of cage)	1.5 ± 15 %
Dead volume	10 l to 20 l
Lifting vanes (ribs)	Three; each having a height 10 % to 12 % of the diameter of cage; base width <100 mm
Heating	Direct steam or electric, thermostatically controlled
G-factors	Wash 0.75 ± 10 %; drain 0.75 ± 10 %; interspin 50 to 100; final extraction 250 to 350
Extract speeds	Programmable
Action	Reversible action, (5 to 10) revolutions in one direction, then reverse
Time rotating at full washing speed	80 % of total washing time

The measurements must be performed on unlaundered and laundered test clothes. In terms of ~~Examples of~~ what may be used as wash test clothes examples are ~~included in the following~~:

34 Mon-AISE A includes wine, tea, coffee, fruit juice, chocolate, grass, mineral oil, make up
35 Mon-AISE B includes grass/mud, tomato, blood mustard, baby food and beef fat
36 Accessible here (https://environment.ec.europa.eu/document/download/557d8ab5-4e75-41a4-a901-1548be7f685d_en?filename=Protocol%20Fitness%20Performance%20-%20Laundry%20Detergents.pdf)
37 ISO 15797:2017 Textiles – Industrial washing and finishing procedures for testing of workwear. See: https://www.iso.org/standard/65152.html
38 ISO 15797:2017 Textiles – Industrial washing and finishing procedures for testing of workwear. See: https://www.iso.org/standard/65152.html

— WFK-PCMS-55 for industrial laundering processes, consisting of 13 different small dirt patches (WFK-Testgewebe GmbH, Germany)

— EMPA 102 consisting of 15 different fresh spots (Swiss EMPA-Test materials)

— Wash cloths of DTI (Danish technology institute) for industrial washing processes or equivalent

~~(laboratory tests can also be accepted as long as it could be proven that the machine/model has predictive values toward reality).~~

~~If a range of recommended dosages given in, the recommended dosage for normally soiled textiles and hard water should be used.~~

The measurement of ~~secondary~~ effects such as bleaching effect, bleaching/damage factor, ash content, greying and fluidity increase can, for instance, be made with multi wash test clothes and analysed according to standard ISO 4312[39] with at least 25 cycles.

~~1.4 Reference product~~

The reference product may be a product on the market or a generic formulation (for example the reference standard detergent IEC ~~AP~~* in IEC 60456[40] [See Table 2] or ISO 15797:2017[41] [See Table 3]) approved by the ~~c~~Competent ~~b~~Body.

Table 2 – Composition of the standard powder detergent (IEC-P) in EN60456:2023 (A12)[42].

The standard powder detergent IEC P is distributed as three separate components, that shall be stored separately for proper stability, with the following composition: - 82% ~~IEC P BASE~~ base powder with enzyme and foam inhibitor (= IEC-P; See table below) - 15% sodium percarbonate - 3% bleach activator tetra-acetylethylenediamine (TAED)			
Ingredient		Amount[43] (%;)	Tolerance (±)
Base powder	Linear sodium alkyl benzene sulfonate	9,4 wt.-%	0,9 wt.-%
	Ethoxylated fatty alcohol C12/14 (7 EO)	5,0 wt.-%	0,5 wt.-%
	Sodium soap (tallow soap)	3,4 wt.-%	0,3 wt.-%
	Foam inhibitor concentrate (12 % silicon on inorganic carrier)	4,1 wt.-%	0,4 wt.-%
	Sodium carbonate	12,4 wt.-%	1,2 wt.-%
	Sodium salt of a copolymer from acrylic and maleic acid (granulate)	2,6 wt.-%	0,3 wt.-%

[39] ISO 4312:1989 Surface active agents - Evaluation of certain effects of laundering - Methods of analysis and test for unsoiled cotton control cloth

[40] See Table B.1 of the EN60456:2023 (A12) "Clothes washing machines for household use – Methods for measuring the Performance".

[41] ISO 15797:2017 Textiles – Industrial washing and finishing procedures for testing of workwear. See: https://www.iso.org/standard/65152.html

[42] See Table B.1 of the EN60456:2023 (A12) "Clothes washing machines for household use – Methods for measuring the Performance".

[43] The percentage sin the table refer to technical products representing the ingredient, no the active substance

	Sodium silicate (SiO2:Na2O = 3,3:1)	3,2 wt.-%	0,3 wt.-%
	Carboxymethylcellulose	1,3 wt.-%	0,1 wt.-%
	Phosphonate (25 % Diethylenetriamine penta(methylene phosphonic acid))	3,0 wt.-%	0,3 wt.-%
	Optical whitener for cotton (stilbene type)	0,2 wt.-%	0,02 wt.-%
	Sodium sulfate	6,9 wt.-%	0,7 wt.-%
	Savinase X.0 T	32 KNPU/kg	3,2 KNPU/kg
	Sodium aluminium silicate zeolite 4 A (80 % active substance)	– to 82 wt.-%	3,0 wt.-%
Sodium percarbonate (active oxygen 13–14 %)		15 wt.-%	
Tetraacetylethylenediamine (active content 90–94 %)		3 wt.-%	

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808 Table 3 – Composition of the reference detergent with optical brightener in ISO 15797:2017[44]. The percentages
809 are based on 100% raw material (pure).

Component	Reference Detergent (with optical brightener)	Reference Detergent (without optical brightener)
ABS-Na (C-12 chain)	0.425%	0.425%
Nonionic surfactant (C13/15 7EO or C12/14 7EO)	6.0%	6.0%
Sodium citrate dehydrate	5.0%	5.0%
Hydroxyethane diphosphonic acid Na-salt (HEDP)	1.0%	1.0%
Metasilicate anhydrous	42.3%	42.6%
Polymer (polymaleic acid)	2.0%	2.0%
Foam inhibitor (phosphoric acid ester)	3.0%	3.0%
Sodium carbonate	39.5%	39.5%

[44] ISO 15797:2017 Textiles – Industrial washing and finishing procedures for testing of workwear. See: https://www.iso.org/standard/65152.html

Optical brightener	0.3%	-
Remaining water from raw material	0.475%	0.475%
Total	100.00%	100.00%
Component	Reference Detergent (with optical brightener)	Reference Detergent (without optical brightener)
ABS-Na (C-12 chain)	0.425%	0.425%
Nonionic surfactant (C13/15 7EO or C12/14 7EO)	6.0%	6.0%

The test product and the reference product must be of the same product category (e.g. designed for the same use). ~~The test product must show efficiency equal to or better than the reference product.~~

If ~~a range of~~ the recommended dosages for the test product ~~is~~ are given in intervals/ranges, the lowest recommended dosage for ~~normally soiled textiles and~~ the highest ~~hard~~ water hardness at the lowest temperature (as claimed in the product) should be used.

1.3. Evaluation

The following aspects must be considered for the assessment of the performance of the product:

— primary laundering effects (e.g. dirt removal, stain removal capacity and bleaching effect)

The following or equivalently relevant aspects can be considered for the assessment of the performance of the product:

— Secondary laundering effects (e.g greying of white washing, and colour-fastness and staining of coloured washing)

— Rinsing agent effects (e.g. drying, ironing or mangling of the washed articles),

To pass the test, the performance ("effectiveness") of the test product must be equal to or better than the reference product. This requirement is fulfilled when each performance effect tested (i.e. primary & secondary laundering; rinsing agent and/or others) on the test product is equal to or better than that of the reference product.

To consider that a test product has fulfilled a performance effect requirement, its results must be positive (test product scores equal to or better than reference product used) in 100 % of the repetitions. If the result is less than 100% positive, 5 new repetitions must be performed. Of these 10 repetitions, 80% must be positive. As an alternative, the applicant may use statistical methods and demonstrate with a one-sided 95 % confidence range that the test product fulfils the laundering effect requirements.

Evaluation of the test results shall be made by the laboratory and shall be clearly explained in the report.

1.4. Documentation requirements

The applicant shall provide the following information to the competent body:

— detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

In addition, detailed relevant remarks and/or pertinent justification on how testing conditions were identical or at least comparable

- type of stains that are representative for the kind of soil expected for the test product,
- information on the recommended dosage for medium degree of soiling at the ~~corresponding~~ highest water hardness and at the lowest recommended washing temperature at which the test product claims to be effective,
- raw data and results (inclusive of statistical, if applicable) showing the effectiveness of the test product and the reference product~~'s ability to remove soiling from textiles and the effectiveness~~, structured by performance effect tested and (if applicable) assessing the role/associated effects to other products that the detergent shall be used with (e.g. stain removers, softeners).
- information on the process/rationale conducive to the approval of a testing machine (e.g. washer) for IILD performance purposes. This information should clearly state machine specifications/configurations under which predictive value/correlation towards real washing conditions are expected.
- information on the process/rationale conducive to the approval of a generic formulation and/or market product as reference against which the test product has been tested for performance purposes. Also, the following information about the reference product~~ against which the test product has been tested~~: recommended dosage for ~~normal~~ medium degree soiling level, lowest washing temperature, highest water hardness ~~temperature~~, date of purchase and date of testing,
- ~~documentation confirming compliance with the laboratory requirements listed in Section 1.1.~~

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product the following requirements also apply:

- Description of the claim made about performance as displayed in the packaging, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).
- Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

2. User test

The effectiveness of the laundry detergent assessed via a ~~The~~ user test ~~must be conducted in at least 5 test centres selected and~~ must comply with the following points:

2.1. Selection of the test centres

~~Responses must be obtained from a~~At least 5 test centres, representing a selection of customers, must test under relevant conditions and provide responses according to the reporting requirements (*See 2.5* Documentation requirements) on the effectiveness of the laundry detergent product.

2.2. Testing conditions ~~Procedure, dosage and reference product~~

- The testing procedure ~~and dosage~~ must conform to the manufacturer's recommendations (as claimed in the product).
- The test period must continue for at least 4 weeks.
- The test product must be tested at medium soiling level under the recommended dosage for the highest water hardness at the lowest washing temperature it claims to be effective. If the recommended dosages are given in intervals/ranges, the lowest recommended dosage should be used.

- The test product must be tested against a reference product, which must be of the same product category (i.e. designed for the same use).
- The reference product ~~may~~ shall be the market product normally used by the user (>12 months of continuous usage) and approved by the Competent Body. Different reference products may be used at the different test centres.

- ~~The test product must show efficiency equal to or better than the reference product.~~

2.3. Method

Every test centre must assess the effectiveness of the product or multi-component system, dosability, rinsing and solubility by answering questions related to the following aspects (or similar formulations):

- ability to launder ~~lightly,~~ moderately (medium degree of soiling) ~~or heavily~~ soiled articles,
- an assessment of primary laundering effects~~, such as~~ (e.g. dirt removal, stain removal capacity and bleaching effect),
- assessment of secondary laundering effects~~, such as~~ (e.g. greying of white washing, and colour-fastness and staining of coloured washing),
- assessment of the effect of the rinsing agent ~~on~~ (e.g. drying, ironing or mangling of the washed articles, if used),
- assessment of the serviceability, such as dosing or solubility,
- how satisfied the test subject is with customer visiting arrangements.

2.4. Evaluation

The criteria aspects considered to evaluate the test are:

- Effectiveness of the test product

Test centres must provide an assessment of the effectiveness of the test product via questions to panellist, which are rated on a scale comprising at least three levels~~, for example,~~ (e.g. 'insufficiently effective', 'sufficiently effective' or 'very effective'). The questions to panellist must refer to the target product performance in comparison with the performance of the reference product, inclusive of secondary functions.

- Teste centre satisfaction.

With regard to how satisfied the test centre is with visit reporting arrangements, the categories must be 'not satisfied', 'satisfied' and 'very satisfied'.

At least 5 test centres must submit responses.

The test is passed when, for 100% of the responses obtained from 5 test centres, the test product shows effectiveness equal to or better than the reference product, namely ~~100% of 5 test centres must rate~~ the product is rated as sufficiently effective or very effective on all product-related points (see Section 2.3) and the test centre satisfaction is rated as ~~be~~ "satisfied" or "very satisfied" with customer visiting arrangements.

A test report must be generated conforming section 2.5 requirements, thus including a description/justification of the user test conditions, results and evaluation.

2.5. Documentation requirements

The report shall include ~~all raw data from the tests, the test procedure described in detail, as well as~~ the following information:

- The way the test centres were selected, The description of the sampling method chosen and how it was performed,
- The test procedure described in detail, inclusive of any relevant remark and/or pertinent justification on how testing conditions across testing centres were identical or at least comparable. It shall, at the minimum, convey information about the wash program, washing temperature, test duration (start/end date), water hardness and soiling level.
- About the test product - the recommended dosage for medium degree of soiling level at the highest water hardness and the lowest recommended washing temperature at which the test product claims to be effective,
- About the reference product - information on the process/rationale conducive to its approval as reference against which the test product has been tested for performance purposes. Also, the following information: recommended dosage for medium degree of soiling level, lowest washing temperature, highest water hardness, date of purchase and date of testing,
- All raw data from the tests and the test procedure,
- All reply forms received from the test centres and the overall result on the washing performance of the user test specified in a table or a form. The responses must be rated in accordance with Section 2.4,
- ~~Information on~~ hHow satisfied the test centre is with customer visiting arrangements and the categories rated.

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product the following requirements also apply:

- Description of the claim made about performance as displayed in the packaging, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).
- Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

Annex 1: Example of reporting template

A template for reporting the description of the procedures and the results of the tests are available here XXXX ~~(http://ec.europa.eu/environment/ecolabel/documents/performance%20test%20IILD.xlsx).~~ This template is not mandatory to show compliance with Criterion X, "Fitness for use".

Revision Version 1.0; September 2024

[DD] Framework for performance testing for dishwasher detergents

Content

Disclaimer

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0. Background

This framework serves as a proof to show compliance with the criterion "fitness for use" of the Commission Decision ~~2017/1216~~ XXXX/YYYY[45] establishing EU Ecolabel criteria for dishwasher detergents.

The test is for products that fall under the scope of the product group "dishwasher detergents'', this means any detergent for dishwashers or rinse aid falling under the scope of Regulation (EC) No ~~648/2004~~ XXXX/YYYY on detergents which are intended to be marketed and used exclusively in household dishwashers and in automatic dishwashers for professional use, the size and usage of which is similar to that of household dishwashers.

For cleaning performance, the product shall show compliance with the criterion ~~through any of both tests~~ based on: the most updated version of either the IKW test or the ~~most updated standard EN 50242/~~ EN 60436[46] standard modified according to point ~~1~~ 2 of this document. For rinse aid performance, the product shall show comparable performance to that of a reference product.

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

In addition to the performance test, it is the responsibility of the applicant to ensure that the product is safe to use on the intended use.

[45] To be added the Commission Decision number once adopted

[46] At the time of revising this framework EN 50242 had been superseded by EN 60436. Currently (September 2024) the most updated EN standard is *"EN 60436:2020 Electric dishwashers for household use - Methods for measuring the performance"*, based on IEC60436:2015.

1. Laboratory requirements to conduct the testing

The manufacturer's test laboratory or/and an external test laboratory can be approved to conduct testing to document effectiveness of hard surface cleaners if the following requirements are met:

- it must be possible for EU Ecolabel competent bodies to monitor the performance of testing (e.g. on-site visits to the laboratory),
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets),
- whenever possible, the samples must be made anonymous for the test laboratory (e.g. product A and product B).
- the test laboratories must be equipped with the devices described in the test method,
- performance of the effectiveness test as well as the test method must be described in the quality control system.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council.

2. Dishwasher detergent performance

This section covers cleaning performance of both mono-functional (dishwasher detergent) or multi-functional (dishwasher detergent + others [e.g. rinse aid]) products.

Products shall be tested against their functional homologues, namely mono-functional shall be tested against mono-functional products and multi-functional shall be tested against multi-functional products.

If rinse aid function is a part of a multifunctional product, then the effect of this claimed function must be tested and documented also as per Section 3.

Any other claims on the performance of the product (e.g. cold wash) must also be tested via suitable methods for the function/claim specified and documented.

2.1. Modifications to ~~EN 50242/~~ EN 60436

If ~~EN 50242/~~ EN 60436 is used the following modifications shall apply:

- The cleaning performance testing of the reference detergent (IEC60436-Type D) and the test detergent shall be carried out at 45 ~~50~~ ± 2°C ~~or at a lower temperature if the detergent claims to be efficient at a temperature below 50 °C)~~, a holding time after reaching the main wash temperature of 8 minutes, ~~and with~~ a rinse temperature of 55° C and with cold pre-wash without detergent. ~~The reference product shall be always tested at 50 °C, regardless the claims of the testing product. If only the rinse aid is tested the rinse temperature shall be 65 ° C.~~
- The machine used in the test shall be connected to cold water and must hold 12 place settings, width of 60 cm and a cleaning performance (oven drying method) in average values of 3,55 ± 0,2~~5~~0 as described in Annex I ~~N~~ of the ~~EN50242/~~ EN 60436. The machine should not be influenced by automatic control to avoid comparative testing differences derived from machine parameter. Hence, Miele G1223 SC (GSL2) or posterior models (e.g. GLS3) with comparable characteristics are recommended.
- ~~A weak acidic rinsing agent in accordance with the standard (formula III) shall be used.~~

~~The rinsing aid dosage shall be a setting at level 3. When applying for rinse aids in combination with dishwasher detergents, the rinse aid shall be used in the test instead of the reference rinse aid.~~

- The dosage of the dishwasher detergent being tested shall be as recommended by the manufacturer.
- A minimum of ~~T~~three attempts shall be carried out at water hardness in accordance with the standard ~~EN 50242/~~ EN 60436. The water hardness of sump water in the 2 heated rinses shall be ≤ 0,5 mmol/l[47] ~~*~~.
- An attempt consists of 5 washes where the result is read after the fifth wash without the dishes being cleaned between the washes.
- The result shall be better than or equal to the reference detergent. (measured after the fifth wash).
- Recipe for the reference detergent"[1] [48] ~~and rinsing agent (formula III),~~ can be found in Annex D in the standard ~~EN50242/~~ EN 60436. The quantities (dosage used) shall be as recommended by the manufacturer of the reference product, but shall not be more than the limits included in the section 5.7 of the standard ~~EN50242/~~ EN 60436 for the detergent ~~and section 5.8 of the standard EN50242/ EN 60436 for the rinse aid agent~~.

~~If rinse aid function is a part of a multifunctional product, then the effect of the claimed function must be documented by a test (e.g. drying performance test included in the standard EN EN50242/ EN 60436).~~

~~* When the machine is run on reference programme or equivalent with a clean load installed and no detergent, the values specified in this criterion shall be achieved. The hardness is to be within the prescribed range.~~

2.2. IKW test

The test performance should be carried out in accordance with the most updated version of the IKW test[49] ~~available at:~~ and following the subsequent modifications to it.

~~https://www.ikw.org/fileadmin/IKW_Dateien/downloads/Haushaltspflege/2016_EQ_Dishwasher_Detergents_Part_B__Update_2015_aktualisiert.pdf~~

A marketed reference detergent or ~~a generic formulation~~[2][50] the generic formulation IEC 60436 Type D shall be used as reference detergent. If the generic formulation is used, then the test shall be carried with a dosage of 20g ~~and~~.

The cleaning performance testing of the reference detergent and the test detergent shall be carried out at a cleaning temperature of 45°C ~~or 50°C~~, a holding time after reaching the main wash temperature of 8 minutes, and a rinse temperature of 55° C. ~~shall be used for testing the cleaning performance~~.

The test detergent must achieve a cleaning performance using the recommended dosage that at least corresponds to the reference detergent ~~or reference rinse aid, the effectiveness of these functions must also be verified in a test~~.

[47] When the machine is run on reference programme or equivalent with a clean load installed and no detergent, the values specified in this criterion shall be achieved. The hardness is to be within the prescribed range.

[48] ~~At the time of writing this~~ In the existing framework the standard detergent ~~is~~ was Detergent Type B (related to IEC 60436 (3rd ed)). Currently, (September 2024) ~~EN 50242 and ion and~~ Detergent Type D (related to IEC 60436 (4th ed)) ~~will become~~ is the standard detergent.

[49] "*IKW Recommendations for the Quality Assessment of the Cleaning Performance of Dishwasher Detergents*." Available at: https://www.ikw.org/fileadmin/IKW_Dateien/downloads/Haushaltspflege/2016_EQ_Dishwasher_Detergents_Part_B__Update_2015_aktualisiert.pdf

[50] ~~If detergent IEC 60436 Type D is used a dosage of 20g shall be used~~

The machine should not be influenced by automatic control to avoid comparative testing differences derived from machine parameter. Hence, Miele G1223 SC (GSL2) or posterior models (e.g. GLS3) with comparable characteristics are recommended.

~~In the case of rinse aids, only the rinse aid its function needs to be verified in a test. In order to achieve optimal rinsing performance results the rinse temperature shall be 65 °C. The testing rRinse aids should be tested against another marketed reference product or a generic formulation (e.g. IEC 60436 rinse aid Formula III KS-C (acid)), using in both cases the same dishwasher detergent.~~ The cleaning performance is considered acceptable when it fulfils one of the following alternatives:

a) All 7 soils are tested:

a) the test product cleans the soiled items as well as or better than the reference product in all 4 classes (bleachable, persistent/alkali-sensitive, starchy-amylase-sensitive, proteinaceous, protease-sensitive) meaning that the results for at least one soil are as good as or better than the reference product for each soil class

or

b) the average value for all 7 soils for the tested product is better than the average value for the reference product. For this purpose, the results firstly need to be standardised to achieve comparative basis.

b) Only 4 soils are tested:

~~If only 4 soils are tested, t~~These must be black tea, starch mix, egg yolk and milk. The tested product cleans as good as or better than the reference product for all 4 soils. Calculating an average value for the 4 results in comparison to the reference product is not permitted.

3. Rinse aid performance

This section covers rinse aid performance of both mono-functional (rinse aid= RA) or multi-functional (detergent + rinse aid =MF) products.

The test is passed when the average test rinse performance is equal or better than the reference rinse aid (IEC 60436, Annex D, Formula III KS-C (acid)).

The performance test conditions for the reference and test rinse aid are (if not specified, applicable to RA and MF):

- Water hardness:
  - (RA) 1.42 – 1.78 mmol $CaCO_3$/l (equivalent to 8-10 °d);
  - (MF) highest indicated, normally 3.74 mmol $CaCO_3$/l (equivalent to 21 °d)
- Temperature:
  - Wash: 50C
  - Rinse: 65C
- Dosage:
  - Reference: 3 mL rinse aid (formula III) + 20 g IEC-D detergent
  - Test product (RA): 3 mL test product + 20 g IEC-D detergent
  - Test product (MF) One standard dose a recommended by the manufacturer.
- Wash cycles: A minimum of 3 wash cycles, after which assessment (readings) can be made.
- Ballast soil: 50 grams of ballast soil must be used in each wash cycle. The ballast soil must be based on starch, protein and fat. Additionally, other constituents from food ingredients may also be present.

— Materials: stainless steel, glass, plastic and porcelain must be used as a minimum.

4. Results and reporting

~~If the modified standard EN 5024 / IEC EN 60436 has been followed~~ For cleaning performance testing (modified EN 60436 or IKW test), the applicant shall provide the following information:

— Information on the detergent test product (at the minimum): composition, type (e.g. mono- or multi-functional); recommended dosage, ~~and~~ the lowest recommended cleaning temperature at which the product claims to be effective; date of testing and date of acquisition/purchase).

— The product's ability to remove soiling from the dishes, cutlery or kitchenware ~~and to dry the dishes~~. Test product can only claim to be efficient on those soils where it cleans equal or better than the reference product;

— Information on the process/rationale conducive to the approval of the product as reference detergent against which the test product has been tested for performance purposes.

— Information about the detergent reference product against which the test product has been tested (at the minimum): composition, type (e.g. mono- or multi-functional); dosage used, temperature, and date of acquisition/purchase and date of testing;

— Description of the standard conditions and the procedure used to perform the testing;

— Results of the tests performed and statistical analysis (if done).

In addition, ~~I~~if the most updated version of the IKW test performance protocol has been followed to test cleaning performance, the applicant shall provide in addition the following information:

— ~~Information on the recommended dosage and the lowest recommended cleaning temperature at which the product claims to be effective~~

— Description of the type of soils and preparation procedure

— ~~The product's ability to remove soiling and dry the dishes. The effectiveness of other products the detergent shall be used with (e.g. rinse aids) shall be reported~~

— ~~Information about the reference product against which the test product has been tested: the lowest recommended dosage or dosage used for the reference product, temperature, date of purchase and date of testing~~

— ~~Description of the conditions used to perform the testing~~

— ~~Results of the tests performed and statistical analysis, if done~~

For rinse aid performance testing (as per section 3), the applicant shall provide the following information:

— Information on the rinse aid test product (at the minimum): composition; type (e.g. mono- or multi-functional); recommended dosage; date of purchase and date of testing).

— Description of the standard conditions and the procedure used to perform the testing;

— List of the type of materials used (at the minimum stainless steel, glass, plastic and porcelain) and description of type of object tested within each material type).

— Information on the process/rationale conducive to the approval of the product as reference against which the test product has been tested for performance purposes.

— Information about the reference rinse aid (at the minimum): composition; type (e.g. mono- or multi-functional), date of purchase and date of testing)

— Results of the tests performed and statistical analysis (if done)

For any other claim relative to the performance of the product, the applicant shall provide the following information:

- A description of the claim/s made on the product (as displayed in it or in its accompanying product sheet).
- For each claim, a description of the standard conditions and the procedure used to perform the testing.
- Results of the test performed and statistical analysis (if done).
- Conclusions, inclusive of reasoned discussion showing the link of the test with the intended claim.

Annex 1: example

A template for reporting the description of the procedures and the results of the tests is available at XXXX ~~here~~ (LINK) ~~*http://ec.europa.eu/environment/ecolabel/documents/dd.xlsx*~~). This template is not mandatory to show compliance with criterion X Fitness for use.

Revision Version 1.0; September 2024

[IIDD] Framework for performance testing for industrial and institutional dishwasher detergents

Content

Disclaimer

Note that throughout this protocol there might be mention to specific commercial products, brands and/or machine model/s which, unless otherwise explicitly indicated, are given for the convenience of users of this document, thus not constituting any endorsement of such product/s named. Also, note that equivalent products might be commercially available after de date of publication of this protocol under different names/codes.

0. Background

This test protocol serves as a proof to show compliance with the criterion "Fitness for use" of the Commission Decision ~~2017/1215~~ XXXX/YYYY[51] establishing EU Ecolabel criteria for "Industrial and Institutional Dishwasher Detergents".

The test is for products that fall under the scope of the product group ""Industrial and Institutional Dishwasher Detergents" this means detergents designed to be used by specialised personal in professional dishwashers. Multi-component systems constituted of more than one component used to build-up a complete detergent shall be tested by means of this protocol too.

The test is passed when a product shows equal or better performance ("effectiveness") than that of the reference product. The performance test can be conducted through a laboratory test or a user test and applies to mono- and multi-component products.

~~In addition to the performance test, it is the responsibility of the applicant to ensure that the detergent is safe to use on the intended use.~~

At the minimum, both type of test shall:

- be tested according to manufacturer's recommendations, as displayed in the product (e.g. label) or accompanying product sheet, specifically:
    - for normally soiled load (medium degree of soiling)
    - at the lowest temperature (e.g. cleaning and drying);
    - at the highest water hardness and;
    - at the recommended dosage considering the former aspects

[51] To be added the Commission Decision number once adopted

- have defined in advance its elements and stages, which must be identical for each repetition (e.g. soiling process; method of analysis) unless testing conditions can be justified as being not identical but comparable.
- Not be tested in combination with plastic cleaning beads.

~~The~~ Further conditions for both types of test are described in the following sections.

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

In addition to the performance test, it is the responsibility of the applicant to ensure that the product ~~detergent~~ is safe to use on the intended use.

1. Laboratory test

~~The laboratory test may be conducted by an external or internal laboratory, as long as it fulfils the requirements set out in Section 1.1. The test must be conducted with the recommended dosage and at the lowest recommended cleaning and drying temperature and the degree of soiling.~~

1.1. Laboratory requirements to conduct the testing.

The manufacturer's test laboratory or an external laboratory can be approved to conduct testing to document effectiveness of industrial and institutional dishwasher detergents if the following additional requirements are met:

- it must be possible for competent bodies to monitor the performance of testing (e.g. on-site visits to the laboratory)
- the testing should be performed preferentially by laboratories that meet the general requirements of EN ISO 17025 or equivalent
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets)
- whenever possible the samples must be made anonymous for the test laboratory (e.g. product A and product B).
- performance of the effectiveness test as well as the test method must be described in the quality control system

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council

1.2. Testing conditions:

At least 5 repetitions shall be made for each test product and each reference product (generic formulation or market product) used.

~~The test product must be tested under realistic conditions: dishes soiled with spots that are representative for the kind of soiled expected where the product will be used or marketed.~~

The test product must be tested to the extent feasible under realistic conditions, which amongst other aspects implies using ~~regarding~~ representative soiling (e.g. dishes soiled with

spots that are representative for the kind of soiled expected where the product will be used or marketed) and temperature profiles relevant to the intended uses, function/s and/or industrial sector/s of the test product (i.e. product category). These ~~T~~testing conditions must be validated by the corresponding competent body. If appropriate, the soiling for testing dishwasher detergents can be used.

~~*1.4* Reference product.~~

The reference product may be a product on the market or a generic formulation (e.g. detergent and rinse aid formulations in EN 17735[52]; See Tables) approved by the competent body. The test product must show efficiency equal to or better than the reference product.

Table 1 – Test detergent formula (density 1.35g/mL) primarily for dishwashing machines according to EN 17735:2022.

Raw material	Mass fraction (%)	Quantity required for 1kg (g)
Fully de-mineralized water	21.60	216.0
Potassium tripolyphosphate solution, 50% (mass fraction)	20.00	200.0
Potassium hydroxide solution, 45% (mass fraction)	35.50	355.0
Sodium silicate (water glass), molar ration *r* (SiO_2/Na_2O) = 3.41 to 3.51; solid mass fraction approximately 35%	22.90	229.0
Total	100.00	1000.0

Table 2 – Test rinse aid formula according to 17735:2022.

Raw material	Mass fraction (%)	Quantity required for 1kg (g)
Fully de-mineralized water	70.00	700.00
Citric acid, monohydrate, crystalline	5.00	50.0
Nicotenside, fatty alcohol $_{C12/C14}$+ 5EO[a] + 4PO[b]	20.00	200.0
Sodium cumolsulfonate, 40% (mass fraction)	5.00	50.0
Total	100.00	1000.0

[a]EO: Ethylene Oxide; [b]PO: Propylene oxide

The test product and the reference product must be of the same product category (e.g. designed for the same use).

If the recommended dosages for the test product are given in intervals/ranges, the lowest recommended dosage for normally soiled dishwashing load ~~and~~ at the highest water hardness and at the lowest temperature (as claimed in the product) should be used.

[52] See Table A.2 and A.3 for detergent and rinse aid formulations. EN 17735:2022 Commercial dishwashing machines - Hygiene requirements and testing.

1.3. Evaluation

To pass the test, the performance ("effectiveness") of the test product must be equal to or better than the reference product. This requirement is fulfilled when each performance effect tested (e.g. cleaning/soil removal; shine, drying time, streak-free performance) on the test product is equal to or better than that of the reference product.

To consider that a test product has fulfilled a performance effect requirement, its results must be positive (test product scores equal to or better than reference product used) in 100 % of the repetitions. If the result is less than 100% positive, 5 new repetitions must be performed. Of these 10 repetitions, 80% must be positive. As an alternative, the applicant may use statistical methods and demonstrate with a one-sided 95 % confidence range that the test product fulfils the laundering effect requirements.

Evaluation of the test results shall be made by the laboratory and shall be clearly explained in the report.

1.4. Reporting information

The applicant shall provide the following information to the competent body:

- detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect. In addition, detailed relevant remarks and/or pertinent justification on how testing conditions were identical or at least comparable
- type of spots that are representative for the kind of soiled expected in the areas/sectors where the products will be marketed (i.e. product category).
- information on the recommended dosage for normally soiled dishwashing load at the corresponding water hardness and the lowest recommended cleaning temperature at which the product claims to be effective
- raw data and results (inclusive of statistical, if applicable) showing the effectiveness of the test product and the reference product, structured by performance effect tested (e.g. product's ability to remove soiling from the dishes, cutlery and kitchenware and to dry the dishes, cutlery and kitchenware). and (if applicable) assessing the role/associated effects to other products that the detergent shall be used with (e.g. rinse aid).
- ~~the product's ability to remove soiling from the dishes, cutlery and kitchenware and to dry the dishes, cutlery and kitchenware the effectiveness of other products the detergent shall be used with (e.g. rinse aids)~~
- information on the process/rationale conducive to the approval of the testing conditions and of a generic formulation and/or market product as reference against which the test product has been tested for performance purposes. Also, the following information about the reference product ~~against which the test product has been tested~~: recommended dosage for normal soiling level, lowest washing temperature, highest water hardness ~~temperature~~, date of purchase and date of testing,
- ~~documentation confirming the compliance within the laboratory requirements in section 1.1~~

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product the following requirements also apply:

- Description of the claim made about performance as displayed in the packaging, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).
- Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

2. User test

The effectiveness of the dishwashing detergent assessed via a ~~The~~ user test ~~must be conducted in at least 5 test centres selected and~~ must comply with the following points:

2.1. Selection of the test centres

~~Responses must be obtained from a~~At least 5 test centres, representing a selection of customers, must test under relevant conditions and provide responses according to the reporting requirements (*See 2.5* Documentation requirements) on the effectiveness of the dishwasher detergent product.

2.2. Testing conditions ~~Procedure, dosage and reference product~~

- The testing procedure ~~and dosage~~ must conform to the manufacturer's recommendations (as claimed in the product).
- The test period must continue for at least 4 weeks with at least 400 test cycles (or 400 ranks in a tunnel washer)
- The test product must be tested at normally soiled dishwashing load under the recommended dosage for the highest water hardness at the lowest washing temperature it claims to be effective. If the recommended dosages are given in intervals/ranges, the lowest recommended dosage should be used.
- The test product must be tested against a reference product, which must be of the same product category (i.e. designed for the same use).
- The reference product ~~may~~ shall be the market product normally used by the user (>12 months of continuous usage) and approved by the Competent Body. Different reference products may be used at the different test centres.
- ~~The test product must show efficiency equal to or better than the reference product~~

2.3. Method

Every test centre must assess the effectiveness of the product or multi-component system by answering questions related to the following aspects (or similar formulations)

- the product's ability to remove soiling from the dishes, cutlery and kitchenware
- the product's ability to dry the dishes, cutlery and kitchenware
- the respondent's satisfaction with the agreement on customer visits

2.4. Evaluation

The criteria aspects considered to evaluate the test are:

- Effectiveness of the test product

Test centres must provide an assessment of the effectiveness of the test product via questions to panellist, which are rated on a scale comprising at least three levels~~, for example,~~ (e.g. 'insufficiently effective', 'sufficiently effective' or 'very effective'). The

questions to panellist must refer to the target product performance in comparison with the performance of the reference product, inclusive of secondary functions.

— Teste centre satisfaction.

With regard to how satisfied the test centre is with visit reporting arrangements, the categories must be 'not satisfied', 'satisfied' and 'very satisfied'.

At least 5 test centres must submit responses.

The test is passed when, for 100% of the responses obtained from 5 test centres, the test product shows effectiveness equal to or better than the reference product, namely ~~100% of 5 test centres must rate~~ the product is rated as sufficiently effective or very effective on all product-related points (see Section 2.3) and the test centre satisfaction is rated as ~~be~~ "satisfied" or "very satisfied" with customer visiting arrangements.

A test report must be generated conforming section 2.5 requirements, thus including a description/justification of the user test conditions, results and evaluation.

2.5. Reporting of the information

The report shall include ~~all raw data from the tests, the test procedure described in detail as well as~~ the following information:

— The way the test centres were selected. A description of the sampling method chosen and how it was performed,

— The test procedure described in detail, inclusive of any relevant remark and/or pertinent justification on how testing conditions across testing centres were identical or at least comparable. It shall, at the minimum, convey information about the wash program, washing temperature, test duration (start/end date), water hardness and soiling level.

— About the test product - the recommended dosage for normally soiled dishwashing load at the corresponding water hardness and the lowest recommended washing temperature at which the test product claims to be effective,

— About the reference product - information on the process/rationale conducive to its approval as reference against which the test product has been tested for performance purposes. Also, the following information: recommended dosage for each soiling level, lowest washing temperature, highest water hardness, date of purchase and date of testing,

— All raw data from the tests and the test procedure

— All reply forms received from the test centres and the overall result on the cleaning and drying performance of the user test specified in a table or a form. The response must be rated in accordance with section2.4

— Information on how satisfied the test centre is with customer visiting arrangements and the categories rated.

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product the following requirements also apply:

— Description of the claim made about performance as displayed in the packaging, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).

— Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

Annex 1: Example

A template for reporting the description of the procedures and the results of the tests is available here XXXX ~~(http://ec.europa.eu/environment/ecolabel/documents/iidd.xlsx).~~ This template is not mandatory to show compliance with criterion X Fitness for use.

Revision Version 1.0; September 2024

[HDD] Framework for testing performance for hand dishwashing detergents

Disclaimer

Note that throughout this protocol there might be mention to specific commercial products, brands and/or machine model/s which, unless otherwise explicitly indicated, are given for the convenience of users of this document, thus not constituting any endorsement by of such product/s named. Also, note that equivalent products might be commercially available after de date of publication of this protocol under different names/codes.

0. Background

This framework serves as a proof to show compliance with the criterion "Fitness for use" of the Commission Decision (EU) ~~2017/1214~~ XXXX/YYYY[53] establishing EU Ecolabel criteria for "Hand Dishwashing Detergents".

The test is for products that fall under the scope of the product group "Hand Dishwashing Detergents''. This means any detergent falling under the scope of Regulation (EC) No ~~648/2004~~ XXXX/YYYY of the European Parliament and of the Council on detergents which is marketed and designed to be used to wash by hand items such as glassware, crockery and kitchen utensils including cutlery, pots, pans and ovenware.

The product group shall comprise products for both private and professional use. The products shall be a mixture of chemical substances and/or ~~shall not contain~~ micro-organisms that have been deliberately added by the manufacturer. ~~In addition to the performance test, it is the responsibility of the applicant to ensure that the hand dishwashing detergent is safe to use on the intended surface(s).~~

The intention is that the product shows a comparable washing performance effect to that of a reference product. The test procedure is based on the IKW recommendation for hand-dishwashing testing[54] with a series of adaptations as disclosed in this framework document.

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

[53] To be added the Commission Decision number once adopted

[54] "Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents"; IKW, SOFW Journal, 128, 5-2002, page 15. Available at: https://www.ikw.org/fileadmin/IKW_Dateien/downloads/IKW-Englisch/HP_EQ-Handgeschirr-e.pdf

In addition to the performance test, it is the responsibility of the applicant to ensure that the product ~~detergent~~ is safe to use on the intended use on the intended surface(s).

1. Laboratory requirements to conduct the testing

The manufacturer's test laboratory or an external test laboratory can be approved to conduct testing to document effectiveness of hand dishwashing detergents if the following requirements are met:

- it must be possible for competent bodies to monitor the performance of the testing (e.g. on-site visits to the laboratory),
- the testing should be performed preferentially by laboratories that meet the general requirements of EN ISO 17025 or equivalent,
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets),
- whenever possible the samples must be made anonymous for the test laboratory (e.g. product A and product B).
- performance of the effectiveness test must be described in the quality control system[1].

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council.

2. Testing

The purpose is to compare the washing performance of the product to that of a reference product. A wide range of test procedures are allowed as long as the requirements below are a part of the test procedure. In the test, washing-up may be done by hand or, alternatively, a machine may be responsible for the mechanical work. The test may either be a test involving the washing up of crockery, e.g. dishes or plates, or a test that does not involve crockery.

The elements and stages included in each repetition must be decided in advance and must be identical for each repetition (e.g. soiling process; method of analysis).

The test performance should be carried out in accordance with the most updated version of the IKW recommendation [55] and following the subsequent modifications to it.

2.1. Control tests (water; internal detergent)

A control test that uses no detergent (namely, only water) shall be additionally performed under the same testing conditions and procedures as per the reference detergent and the test detergent product. The aim of this control test is to ensure that the use of detergent actually implies a boost of the cleaning capacity and cleaning effect. If the control test results are comparable to the tested detergents, then the test shall be deemed as unsuitable/inconclusive. The number of washed items (e.g dishes, plates) shall match the highest number in any of the tested (reference or test) detergents[56]. Consequently, control test shall be performed after the tests made with the reference and each test detergent.

As verification of sufficient reproducibility/quality in the EU Ecolabel performance test for hand dishwashing detergent, the testing laboratory and/or manufacturer laboratory shall have internal controls in place. If following the IKW test, these should be as displayed in Table 6 of the *Section 4.2.4.*

[55] "*IKW Recommendation for the Quality Assessment of the Cleaning Performance of Hand Dishwashing Detergents (2024).* Available at: https://www.ikw.org/fileadmin/IKW_Dateien/downloads/Haushaltspflege/2024_EQ_HGSM_Part_A_EN.pdf

[56] Example -> if reference detergent = 20 plates and test detergent = 22 plates; then the control = 22 plates)

Results for internal control and staff training[57]. The internal controls must be relevant to the conditions of the test (e.g. type of soil tested - using Soil 2 if aiming to test performance in high fat soil). The formulation of the internal control shall be as in section 4.2.3. *Recipe of the internal control* (See Table 5). Alternative controls and controls' conditions could be accepted by the Competent Body conditioned to justifying its comparability.

2.2. Number of repetitions

At least 5 repetitions must be performed for the reference detergent per soil type.

At least 5 repetitions must be performed ~~in which the~~ for each test detergent per soil type~~. and reference products, compared with other.~~

At least X repetition/s must be performed for the control (only water).

At least Y repetition/s must be performed for the control (internal detergent).

2.3. Water parameters

- The same volume of water (5L) shall be used in all repetitions. The volume shall be determined and recorded in litres (~~to~~ one decimal point precision).
- The water hardness shall be 2,5 ± 0,5 mmol $CaCO_3$/l (equivalent to 14.0 ± 2.81°d)~~.~~ and it shall be measured and recorded.
- The water temperature conditions shall be the same for all repetitions and shall be measured in Celsius degrees. The temperature shall be measured at the start and at the end of each washing cycle (repetition). At the start of the test the soak temperature in the basin shall be 45 ± 1°C.~~ and kept constant throughout the test. However,~~ A decrease of the water temperature during the test is acceptable, if it is not more than 10 °C and the same temperature decrease is documented for all repetitions.

2.4. Test and reference product parameters

A market and/or generic formulation can be used as reference products for performance testing.

~~The reference generic formulation shall be the one listed in Table 1.~~

~~Table 1. Reference generic formulation for testing hand dishwashing detergents~~

~~Ingredient~~	**~~% data as active content~~**
~~Sec sodium alkane sulfonate (ex 60%)~~	~~10,80~~
~~Sodium lauryl ether sulfate 2EO (ex 70%)~~	~~2,80~~
~~Cocamidopropyl betaine (ex 30%)~~	~~1,20~~
~~Kathon DG (as received)~~	~~0,08~~
~~Water~~	~~Added to 100%~~

- ~~The dosage for the reference detergent for the performance test shall be of 4 per 5 litre of water. The detergent must be mixed and completely dissolved in the water.~~
- ~~The~~ Each test detergent product ~~shall~~ must:
  - Be dosed according to the dosage recommended by the manufacturer for one litre of washing water for cleaning normally soiled dishes (indicated in g/l washing water or ml/l washing water) in all repetitions.
  - ~~The detergent must b~~Be mixed and completely dissolved in the water.

[57] "*IKW Recommendation for the Quality Assessment of the Cleaning Performance of Hand Dishwashing Detergents (2024).* Available at: https://www.ikw.org/fileadmin/IKW_Dateien/downloads/Haushaltspflege/2024_EQ_HGSM_Part_A_EN.pdf

~~[1] As verification of sufficient quality in the test of the hand dishwashing detergent's fitness for use, the testing laboratory or manufacturer laboratory shall document the following mean values from 5 dishwashing tests in the results section of the test report that were carried out with the IKW reference hand dishwashing detergent (dosage 4ml/5l of dishwashing water) using the reference number of plates for soil 1 and 2 as required in the IKW "Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents" (SOFW Journal, 128, 5-2002, page 15)~~

~~Indicative value for soil 1: 11-15 plates (tolerance ± 10%)~~
~~Indicative value for soil 2: 15-20 plates (tolerance ± 10%)~~

2.5. Soil parameters

— At least one type of soil must be used, which ~~The same soil~~ must be used for all repetitions~~.~~.

— The origin and/or chemical composition of the soil could ~~shall~~ be in accordance with the test soils described in the IKW performance test[58]: Alternative soil formulations could be accepted by the Competent Body conditioned to justifying its comparability with the soil types stated in it[59]. Whatever the case, it should contain proteins, carbohydrates and fats and justification of comparability/equivalence should be primarily be based on the share (%) of each of these groups expressed in dry mass basis (%; w/w).

~~"*Recommendation for the quality assessment of the cleaning performance of hand dishwashing detergents*" available at www.ikw.org/fileadmin/content/downloads/Haushaltspflege/HP_EQ-Handgeschirr- e.pdf~~

— If the product claims "high degreasing efficiency", at least one of the tested soils has to have high fat content (≥60%; w/w). If following the IKW method, this implies the compulsory use of Soil type 2 (See Table 3 – Recipe of Soil 2 (high fat content). Other "high fat" soils could be accepted by the Competent Body condition to meeting the minimum fat percentage and justifying its comparability.

— The soil must be prepared as described in the IKW performance test but alternative soil formulations/preparations can be accepted by the Competent Body conditioned to justifying its comparability with the soil types stated in it[60].

— The soil must be homogenous, ~~and~~ of even consistency~~.~~ and ~~E~~enough soil for the entire test must be prepared in one batch[61],

— The quantity of soil applied to a substrate~~,~~ (e.g. plates or dishes), or to the washing water, must be the same in all repetitions and must be weighed in grams ~~to~~ (one decimal point precision).

2.6. Test procedure

— The test and reference products must be made anonymous to the person(s) performing the test.

~~— At least 5 repetitions must be performed with: each product: the test product; and reference product.~~

~~— The elements and stages included in each repetition must be decided in advance and must be identical for each repetition.~~

[58] "*IKW Recommendation for the Quality Assessment of the Cleaning Performance of Hand Dishwashing Detergents (2024).* Available at: https://www.ikw.org/fileadmin/IKW_Dateien/downloads/Haushaltspflege/2024_EQ_HGSM_Part_A_EN.pdf

[59] An example of alternative soil preparation is displayed in Table 2 of the "Standard protocol for evaluating performances of hand dishwashing detergents. ASOCASA, Innovhub SSI . HPC Today journal Vol 18(1) 2023. Available at: https://www.teknoscienze.com/tks_article/standard-protocol-for-evaluating-performances-of-hand-dishwashing-detergents/

[60] An example of alternative soil preparation is displayed in Table 2 of the "Standard protocol for evaluating performances of hand dishwashing detergents. ASOCASA, Innovhub SSI . HPC Today journal Vol 18(1) 2023. Available at: https://www.teknoscienze.com/tks_article/standard-protocol-for-evaluating-performances-of-hand-dishwashing-detergents/

[61] At the minimum this implies 10+X + Y repetitions =5 reference detergent + 5 test detergent + X water control + Y internal detergent control.

- The temperature and relative humidity of the room must be measured (at least at the beginning and the end of the test) and kept reasonably constant in all repetitions.
- A fixed procedure for the preparation of the plates and the application of soil (allowing sufficient time for drying), dishwashing process (manual dishwashing or removal of soil by machinery) and *end-point* or *point of saturation*[62] must be determined in advance and in line with the IKW performance test.

2.7. Assessment of cleaning/washing capacity

The test must be capable of generating results that provide a measure of the cleaning capacity.

The cleaning capacity must be expressed in grams of soil removed per 5 litres of water before reaching the ~~above predefined~~ point of saturation.

A positive result of a test round is obtained when the cleaning capacity is equal to or better than that of the reference product.

To consider that the test product has fulfilled the performance requirements its results must be positive in 100 % of the repetitions. If the result is less than 100% positive, 5 new repetitions must be performed. Of these 10 repetitions, 80% must be positive. As an alternative, the applicant may use statistical methods and demonstrate with a one-sided 95 % confidence range that the test product fulfils the performance requirements.

3. Results and reporting ~~Documentation~~

3.1. General requirements

All tests must be reported in accordance with the following points (to be part of the test reports):

- Description of how the test and reference products were made anonymous to the person(s) performing the test.
- Description of the test and reference product and information on the process/rationale conducive to the approval of the product as reference against which the test product has been tested for performance purposes. Relevant information in this sense include (at the minimum): formulation, recommended dosage, lowest washing temperature, date of purchase and date of testing
- Temperature and humidity in the test room in all repetitions and details describing how the test person(s) ensured that these conditions were kept reasonably constant in all repetitions.
- Description of the composition of the soil and the procedure used to ensure that the soil was of a homogenous and even consistency. If different from IKW recommendation, justification on how the soils used were comparable to the soil types specified within the IKW recommendation.
- Hardness of the water and specification of the calcium/magnesium ratio, and how it was achieved.
- Quantity of water used in the repetitions and description of how the water temperature requirement was fulfilled.
- Results of the weighing of the hand dishwashing detergent in each repetition and description of the procedure for dissolving the product in the water.
- Description of the procedure for adding the soil to either a substrate (e.g. plates or dishes) or to the washing water.
- Results of the weighting of soil in each repetition.

[62] Point of saturation can be defined as when the cleaning effect is no longer observed, when soil is floating at the surface water, when foam layer is not completely covering the surface or when there is no visible foam.

- Description of the other elements and stages in each individual repetition.
- Description of how cleaning capacity was measured. If different from IKW method, justification about the suitability of the analytical method chosen for measurement these aspects.
- ~~and if~~Raw data from all repetitions stated in terms of cleaning capacity (if applicable).
- Description of the internal controls used. If different from IKW test, justification for its comparability and data showing how the tolerances (deviation from target washed plates) were defined.
- Final results, inclusive considerations about the control (water) test, and~~, if applicable, a~~ statistical evaluation of the data (if applicable).

3.2. Specific requirements

In addition to the previous general reporting requirements, if a test product has "*high degreasing efficiency*" claim on the performance the product the following requirements also apply:

- Justification that, at least, one the soils tested had high fat content (≥60%; w/w). If following the IKW method, this implies compulsory use of Soil type 2 (See Table 3 – *Recipe of Soil 2 (high fat content)*. If not using IKW method soil type 2, then description of the type of soil used, inclusive of justification why the type of soil used is fit for the purposes of testing degreasing efficiency (e.g. suitability, proof that is primarily composed of fat).
- Final results, inclusive of considerations highlighting how degreasing efficiency was assessed/quantified and how the results obtained support (or not) the claim made.

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product the following requirements also apply:

- Description of the claim made about performance as displayed in the packaging, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).
- Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

Annex 1: Example of reporting template

A template for reporting the description of the procedures and the results of the tests are available here XXXX ~~(http://ec.europa.eu/environment/ecolabel/documents/HDD.xlsx).~~ This template is not mandatory to show compliance with Criterion X, "Fitness for use".

Revision Version 1.0; September 2024

[HSC] Framework for testing performance for hard surface cleaning products

Content

Disclaimer

Note that throughout this protocol there might be mention to specific commercial products, brands and/or machine model/s which, unless otherwise explicitly indicated, are given for the convenience of users of this document, thus not constituting any endorsement of such product/s named. Also, note that equivalent products might be commercially available after de date of publication of this protocol under different names/codes.

0. Background

This test protocol serves as a proof of compliance with the criterion "Fitness for use" in the Commission Decision ~~2017/1217 of 23 June 2017~~ XXXX/YYYY[63] establishing the EU Ecolabel criteria for "Hard Surface Cleaning Products".

The test is for products that fall within the scope of the product group "Hard Surface Cleaning Products". This means cleaning products designed to be used for routine cleaning of hard surfaces such as walls, floors and other fixed surfaces including those in kitchens, windows, glass and other highly polished surfaces or sanitary facilities, such as laundry rooms, toilets, bathrooms, showers.

The test is passed when a product shows equal or better performance than that of the reference product. The performance test can be a laboratory test or a user test (only for professional products). The conditions for both types of test are described in the following sections.

Any other claim made on the performance of the product (as displayed in it or in its accompanying product sheet) that is not already specified in this performance framework must also be tested via suitable methods for the function/claim specified and documented.

The elements and stages included in each repetition must be decided in advance and must be identical for each repetition (e.g. soiling process; method of analysis, scoring system), unless testing conditions can be justified as being not identical but comparable.

In addition to the performance test, it is the responsibility of the applicant to ensure that the ~~cleaning~~ product is safe to use on the intended use ~~surface(s)~~.

1. Laboratory test

The aim of the laboratory test is to confirm that the test product cleans as well as or better than a comparable reference product (either a market or a reference generic formulation).

Any type of hard-surface cleaning product (i.e. consumer and/or professional) can be tested via Laboratory test.

1.1. Laboratory requirements

[63] To be added the Commission Decision number once adopted

The manufacturer's test laboratory or/and an external test laboratory can be approved to conduct testing to document effectiveness of hard surface cleaners if the following requirements are met:

- it must be possible for EU Ecolabel competent bodies to monitor the performance of testing (e.g. on-site visits to the laboratory),
- the EU Ecolabel Competent Body must have access to all data on the product (e.g. technical data sheets),
- whenever possible, the samples must be made anonymous for the test laboratory (e.g. product A and product B). For tests where the reference product is a generic formulation, the tester shall be aware to modify the test method as appropriate,
- the test laboratories must be equipped with the devices described in the test method,
- performance of the effectiveness test as well as the test method must be described in the quality control system.

Competent bodies shall preferentially recognise attestations which are issued by bodies accredited in accordance with the relevant harmonised standard for testing and calibration laboratories and verifications by bodies that are accredited in accordance with the relevant harmonised standard for bodies certifying products, processes and services. Accreditation shall be carried out in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council.

1.2. Testing conditions

1.2.1. Control test (water)

A control test that uses only water shall be additionally performed under the same testing conditions and procedures as per the reference product and the test product. The aim of this control test is to ensure that the use of cleaning product actually implies a cleaning boost. If the control test results are comparable to the reference or test product, then the test shall be deemed as unsuitable/inconclusive.

At least X repetitions must be performed for the control (only water) test

1.2.2. Test and Reference product

- The test product and the reference product shall be of the same product category (designed for the same use, i.e. both should be WC cleaners, kitchen cleaners, sanitary cleaners, flooring cleaners, window cleaners, etc.) and in the same dilution form (RTU, undiluted, concentrated, etc.).
- A marketed ~~reference~~ product or a generic formulation can be chosen as the reference product[64]. A marketed product is understood to be a product that is available for purchase at the time of testing, in the intended market segment and in the intended market region of the applicant's product. The marketed reference product or the generic formulation shall be approved by the competent body in charge of the application prior to the testing.[65]
- If a marketed product is chosen as a comparative reference product (e.g. for all purpose cleaners, for sanitary cleaners or for window cleaners), it shall be one present in the region, where the applicant's product is to be marketed and making the similar claims about cleaning properties as the applicant's product. The marketed product must be approved by the competent body in charge of the application prior to the testing, and the trade name must be referenced in the test report and technical sheets and the label shall be provided to the competent body. If the test product is marketed for both consumers and professionals use, then the market reference product must be a professional product.

[64] ~~A marketed product can be selected regardless of sales volume. It can also be another EU Ecolabel product that has the same intended use.~~

[65] Note to Competent Bodies: A database with the marketed reference products that have been approved by the different Competent Bodies (CBs) can be found in CIRCA (only accessible to CBs).

- When a test product requires dilution, the reference product shall have a comparable application, dilution ratio and pH-value. For example, this applies to concentrated all-purposes cleaners and kitchen cleaners.

- ~~For concentrated all-purpose cleaners and kitchen cleaners, the reference product shall have the same application, comparable dilution ratio and pH-value as the test product.~~

- A generic composition not included in Table can be used as a comparative reference product as long as:

  - it has a composition which is representative for the products on the market,
  - it is approved by the corresponding Ceompetent Bbody, and
  - the exact formulation is publicly available free of charge.

Table shows several generic formulations that shall be used as reference products for some cleaners, whenever an applicant chooses to use a generic formulation rather than a marketed product.

Table 1. Generic formulations that shall be used as comparative reference products.

Acidic toilet cleaners Source: Recommendation for the quality assessment of acidic toilet cleaners (SOFW-journal 126, 11, 2000)		
Ingredient	**% Composition**	**CAS n., specification**
Citric acid monohydrate	4 %	
Alkane sulphonateHostapur SAS 60	1 %	Hoechst. active
Rheozan	0,23 %	Rhodia
Tap water	94,77 %	
Preparation and observations: Have tap water ready, slowly add Rheozan and stir with the dissolver (tap water) for 30min until completely dissolved. Then add citric acid and alkane sulphonate (pure). Do not use for at least 12h after preparation. The following physic-chemical parameters must be complied with: Viscosity: 550mPass ± 50 (Brookfield 20 °C, Spindle 2, 20 rpm or alternatively Brookfield 20 °C, 450mPa/s±50 with a small sample adapter spindle 31, 20 rpm) Viscosity adjustment by adding Rheozan		
Bathroom cleaner		
Ingredient	**% Composition**	**CAS n., specification**
Citric acid monohydrate	4 %	
Hostapur SAS 60	1 %	Hoechst, active
Tap water	95 %	
Preparation and observations: Same for as for acidic toilet cleaners, but without adding Rheozan for viscosity; pH value of the reference to be adjusted to 3.5.		
All-purpose cleaners* Source: ~~Recommendation for the quality assessment of all-purpose cleaners (SOFW-journal 141, 6, 2015)~~ DE-UZ 194, v1.2 (See Appendix C)		
Ingredient	**Composition (%)**	**CAS n., specifications** (i.e. trade name; [product's active content]
Potassium carbonate	0.080	Potash [100%]
Sodium carbonate	0.656	Soda light [100%]
Fatty acid (palm kernel oil)	0.495	Wilfarin DK-1218 (Wilmar) [100%], Palmera B 1220 E (KLK) [100%]
MGDA liquid	0.125	Trilon M (BASF) [100%]
Ether sulfate Na-salt	3.420	Texapon N 70 (BASF) [70%], Emal 270 D (Kao) [70%], Marlinat 242 70 (Sasol) [70%]
sek. Alkane sulfonate Na-salt	1.670	WeylClean® SAS 60 (Wey-lchem) [100%]
ACTICIDE MBR 1	0.050	Ex Thor

Water, fully demineralized	93.504	-
Preparation and observations: Put carbonates in distilled water (30 °C) and dissolve, then add fatty acid while stirring continuously. Allow the mixture to stir for 30 minutes until saponification is complete. Now add the other components one after the other while stirring. At the end, a clear, homogeneous solution is obtained. pH 10,5 – 11,0 **Note:** *APCs can be very different depending on their application (pH value, dilution, concentration of detergents, etc.). Therefore before using this generic formulation it shall be ensured that the properties of the reference product are similar to the test product.*		
~~**Ingredient**~~	~~**% Composition**~~	~~**CAS n., example**~~
~~Sodium hydroxyde,~~	~~1,74 %~~	~~aqueous solution conc 45%~~
~~Alkylbenzene sulfonic acid C_{10-13}~~	~~6 %~~	~~ca conc 97%~~
~~Fatty acid C_{12-18}~~	~~1 %~~	~~Edenor K12-18 (100%)~~
~~Fatty alcohol ethoxylate C_{12-18}, 7EO~~	~~4 %~~	~~Dehydol LT 7 (100%)~~
~~Fatty alcohol ether sulfate C_{12-14}, 2EO Na salt~~	~~4,29 %~~	~~Texapon N70 (70%)~~
~~Methylisothiazoline/benzisothiazolinone~~	~~0,1 %~~	~~Acticide MBR1~~
~~Water, fully demineralized~~	~~82.87 %~~	
~~**Preparation and observations:**~~ ~~Take approx. ¾ of the water as a basis, add sodium hydroxide (NaOH), add alkylbenzene sulfonic acid and stir for at least 15 min. Add fatty acid and stir for at least 10 min. Add fatty alcohol ethoxylate and stir for ca 10 min. Add fatty alcohol ether sulfate and stir until full dissolved.~~ ~~Control pH value (target value 9.3±0.3) if this target is not met, adjust with NaOH. Add preservative (i.e. methylisothiazoline/benzisothiazolinene), add remaining water, stir for 10 min~~ ~~Appearance: yellowish, clear~~		
Window cleaners Source: "Recommendation for the Quality Assessment of Glass Cleaning Agents / Glass Cleaners" (SOFW-Journal 148, 4-2022) (See Annex C)		
Ingredient	**Composition (%)**	**CAS n., specifications** (i.e. trade name; [product's active content]
Cocamidopropyl betaine	0.171	147170-44-3 [38%]
Propylene glycol n-butyl ether	1.000	5131-66-8 [100%]
Isopropyl alcohol	6.500	67-63-0 [100]
Water, fully demineralized	92.329	
Preparation and observations: Add and homogenise the corresponding masses of the raw materials stated to the reach the desired active content in the final window cleaner formulation (as displayed in column *"Composition (%)"*).		

~~** APCs can be very different depending on their application (pH value, dilution, concentration of detergents, etc.). Therefore before using this generic formulation it shall be ensured that the properties of the reference product are similar to the test product.~~

1.2.3.Dosage

The highest recommended dilution should be used in the test~~,~~ when a dosage range is given for a normal soiling.

Dosages used shall be as follows:

1.3.a) Undiluted products

- *Clear drying and streak formation performance is tested in RTU form (diluted form of the undiluted products):* The dosage and dilution used shall be the recommended reference dosage and dilution for normal soil or normal use. If a dosage or dilution interval is given, the lowest recommended dosage or highest recommended dilution must be used in the test. If no recommended dosage is given, both the reference product and the test product shall be tested using the same dosage.

- *Cleaning performance is tested in RTU form:* Only if the test is not successful and the product claims on the packaging/user instructions that it can also be used under its undiluted form, a second test

should be performed under the undiluted conditions. The dosage and dilution used shall be the recommended reference dosage and dilution for normal soil or normal use. If a dosage or dilution interval is given, the lowest recommended dosage or highest recommended dilution must be used in the test. If no recommended dosage is given, both the reference product and the test product shall be tested using the same dosage. The results of the test performance should be compared to those of the generic formulation or marketed product.

1.3.b) Ready to use products

Clear drying and streak formation performance and cleaning performance are tested in RTU form. The dosage and dilution used shall be the recommended reference dosage and dilution for normal soil or normal use. If a dosage or dilution interval is given, the lowest recommended dosage or highest recommended dilution must be used in the test. If no recommended dosage is given, both the reference product and the test product shall be tested using the same dosage.

1.3.c) Powder products or other solid forms

Powder products or other solid forms shall be tested in their "RTU form" and shall be prepared following the recommended dilution instructions.

1.2.4.Soiling

The soil or soil mixture must be relevant for the use of the product, homogeneous and, if prepared artificially, based on well-described substances. Enough soil for the whole test must be prepared in a single batch. The soil mixture to be tested for each type of product and the information about its preparation are specified in Table .

Table 2. Reference sources of soil and fat mixture to be tested for each type of product. Equivalent soil and fat mixtures can also be used.

Product	Soiling mixture	Preparation of the soiling - Source
Bathroom cleaners	Descaling: lime soap and limescale	SOFW-Journal 129, 11-2003
Acid toilet cleaners	Descaling: limescale	SÖFW-Journal 126, 11-2000
Kitchen cleaners	Fat removing	SOFW-Journal 144, 7+8/2018
	Descaling: limescale[66]	test on white Carrarra marble
	Descaling: lime soap[3]	SOFW-Journal 144, 7+8/2018
All-purpose cleaners	Fat removing	SOFW-Journal 141, 6-2015
Window cleaners	Light fat removing	~~No official test has been found.~~ SOFW-Journal 148, 4-2022
	Strip-less drying	
~~Window cleaners (formulation for fat soiling)~~ ~~Source: ABL LABORATOIRE www.abl-laboratoire.fr~~		
~~Ingredient~~	**~~% composition~~**	**~~Comments~~**
~~Peanut oil~~	~~81,3%~~	~~Available in SIGMA~~
~~Kaolin~~	~~18,7%~~	~~Available in FLUKA~~
~~Preparation and observations:~~ ~~Mix the ingredients until the mix is homogenous. Spread 1g of this soil on a mirror (30 x 30 cm) with a pipette by crossing like a paint. Place the mirror into the oven at 100°C for 2h and .leave it to cool for 1h before testing.~~		

[66] Only if the manufacturers claim on the package a descaling effect or a possible use on this kind of surface (e.g. sink cleaner)

1.2.5.Procedure and testing requirements

The cleaning procedure shall reflect realistic use conditions (i.e. considering the mechanical factor of cleaning) and can be manual or performed by machinery.

Each product (test and reference) shall be tested in at least 5 repetitions. The order of testing of the products plus the control (only water) shall be randomised.

The quantity of soil applied to tiles or another substrate shall be the same for each tile or substrate-part, weighed in grams to one decimal point (within a tolerance ± 0,5g).

The test must be capable of generating results that provide a measure of the cleaning performance according to the product tested. Cleaning performance can be measured visually, photometrically (i.e. measuring reflectance), gravimetrically or by means of another relevant method. The method of measurement, including a possible scoring system, shall be decided in advance.

To prepare the RTU form according to the manufacturer instructions, water at a water hardness level of 2,5mmol $CaCO_3$/l (equivalent 14.0 °d) shall be used and homogenized. (Information about how to achieve this water hardness can be found in the preparation specification of SOFW-Journal 141, 6-2015). Prepared cleaning product solutions may be used at most for one working day and shall be homogenised prior to any use.

Table 3. Procedure for testing the cleaning performance of the different products. Equivalent test methods can be used.

Product	Parameter to be tested	Procedure - Source
Bathroom cleaners (RTU)*	Limescale removal properties tested on horizontal and vertical surfaces Lime soap removal	SOFW-Journal 129, 11-2003 When testing bathroom cleaners according to SOFW-Journal 126, 11-2000 the reference cleaner as described in table 1 can be used
Bathroom cleaners (undiluted)	Limescale removal properties tested on horizontal or vertical surfaces Lime soap removal	
Acid toilet cleaners	Limescale removal properties	SOFW-Journal 126, 11-2000
Kitchen cleaners	Limesoap and limescale properties (if claimed to be effective)	SOFW-Journal 144, 7+8/2018
	Fat removing	SOFW-Journal 144, 7+8/2018
All-purpose cleaners	Fat removing	SOFW-Journal 141, 6-2015
Window cleaners (RTU)*	Light fat removing Clear drying and streak formation	SOFW-Journal 148, 4-2022 As leaving a clean and stripe-less surface is also one of the main performance aspects of window cleaners, the method for stripe-less drying as described in the IKW method (SOFW Journal 130, 54-2005) for APC could be used for window cleaners.

** the lowest concentration, i.e. highest dilution, shall be used in the test method*
For undiluted window cleaners the same requirements are applied.

1.3. Assessment

A positive result of a test round is obtained when the cleaning effect and/or any other effect assessed, are equal to or better than that of the reference product.. Therefore, ~~T~~the assessment of cleanliness must include testing and comparison of the test product with a reference product.

For the test product to be considered to have fulfilled the performance requirements, its results must be positive in all the repetitions[67]. If the result is less than all positive, 5 new repetitions must be performed. Of these 10 repetitions, a ratio (positive results/total number of results) of 0,8 must be achieved. In case limescale removal is tested for an acidic toilet cleaner, a ratio of 0,7 (7 positive results/10 repetitions) shall be considered as a positive outcome of the test.

As an alternative the applicant may use statistical methods and demonstrate with a one-sided 95% confidence range that the test product is ~~as good as~~ equal or better than the reference product.

Table 4. Assessment of the results for testing the cleaning performance of the different products

Product	Assessment according to the procedure described in
Bathroom cleaners	SOFW-Journal 129, 11-2003
Toilet cleaners	SOFW-Journal 126, 11-2000
Kitchen cleaners	SOFW-Journal 144, 7+8/2018
All-purpose cleaners	SOFW-Journal 141, 6-2015
Window cleaners	SOFW-Journal 148, 4-2022 ~~Test window cleaner product should be as good as a reference product and better than water of a defined hardness.~~
	SOFW-Journal 130, 54-2005 (only the method for stripe-less drying)

1.4. Documentation requirements

All tests must be reported in accordance with the following points to be included in the report:

- Description of how the test and reference products were made anonymous to the person(s) performing the test.
- Description of the reference product and information on the process/rationale conducive to the approval of the product as reference against which the test product has been tested for performance purposes. ~~and description of how the reference product was chosen and approved by the corresponding Ccompetent Bbody~~. If the test product has a corresponding generic formulation in Table and it is not used, justification of the choice of the reference product or any other generic formulation. If an alternative generic formulation is used, that formulation shall be provided.
- Description of the dosages used for the test product and the reference product.
- Description of the type(s) of surface(s) and soil mixture used in the performance test and their relevance for the test product.
- Description of the procedures for adding the soil to the substrate and the quantities. The quantities applied should be expressed in grams to one decimal point.
- Description of how the cleaning capacity w~~as~~ measured and raw data from all repetitions, inclusive of control test (only water) ~~stated in terms of cleaning capacity or~~ .
- Final results, inclusive of calculations and considerations about the control (only water) test, ~~All raw data used in the testing and calculations~~ and statistical evaluation of the data, if applicable.

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product (as displayed in it or in its accompanying product sheet) the following requirements also apply:

- Description of the claim made about performance, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).

[67] "Positive results" mean that the cleaning performance of the test product is equal or better than that of the reference product.

— Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect.

2. User test

The aim of the user test is to show whether the test product cleans as well as or better than a comparative reference product.

Only professional products can be tested via the User test.

2.1. Selection of the test centres or testers~~68~~

~~For the testing of non-professional grade products, responses must be received from a minimum of 80 persons, randomly selected in the sales region and who normally use a product of the same product category as the test product.~~

~~Random selection requires the use of some form of random sampling (e.g. stratified random sampling, simple random sampling without replacement). It is important to use a random sample because it relies on the laws of probability to select a representative sample and then the results can then be used to make inferences about the background population.~~

For testing of professional grade products, responses must be received from at least 5 professional users or test centres, selected in the sales region and that normally use a product of the same product category as the test product.

Testers and test centres may be selected among the customers of the manufacturer of the test product.

~~*2.2 Procedure, dosage and reference products*~~

~~The test must be performed on the type(s) of surface relevant in relation to the recommendations of the manufacturers.~~

~~The test period must allow for at least five uses of the test product and the reference product[69]. Each use should be performed as the test person or test centre would normally use his/her product in terms of frequency.~~

~~The dosages used must be the dosage recommended by the manufacturers.~~

~~The test product and the reference product normally used[70] by the testers or test centre should be of the same product category (e.g. RTU, undiluted product), designed for the same purpose (e.g. WC cleaner, kitchen cleaner, sanitary cleaner, flooring cleaner, window cleaner) and claiming similar properties[71].~~

2.2. Testing conditions

2.2.1. Reference and test product

— The test product and the reference product normally used[72] (>12 months of continuous usage) ~~by~~ the testers or test centre shall be of the same product category (designed for the same use, i.e. both should be WC cleaners, kitchen cleaners, sanitary cleaners, flooring cleaners, window cleaners, etc.) and in the same dilution form (RTU, undiluted, concentrated, etc.).

— A marketed ~~reference~~ product chosen as the reference product is understood to be a product that is available for purchase at the time of testing, in the intended market segment and in the

~~68 Testers and test centres may be selected among the customers of the manufacturer of the test product.~~
~~69 Each use should be performed as the test person or test centre would normally use his/her product in terms of frequency.~~
70 A product normally used means for example which has been used weekly (by the test centre or testers) for at least one year.
71 Both the test product and reference product can be manufactured by the same manufacturer.
~~72 A product normally used means for example which has been used weekly (by the test centre or testers) for at least one year.~~

intended market region of the applicant's product.. The marketed reference product shall be approved by the competent body in charge of the application prior to the testing.[73]

— The marketed product must be approved by the competent body in charge of the application prior to the testing, and the trade name must be referenced in the test report and technical sheets and the label shall be provided to the competent body. If the test product is marketed for both consumers and professionals use, then the market reference product must be a professional product.

— When a test product requires dilution, the reference product shall have a comparable application, dilution ratio and pH-value. For example, this applies to concentrated all-purposes cleaners and kitchen cleaners.

— If the test product contains microorganisms (*microbial cleaning products)*, in addition to the former required qualifications for a market product to be eligible as reference product, the reference product shall be without microorganisms.

2.2.2.Procedure and dosage

The test must be performed on the type(s) of surface relevant in relation to the recommendations of the manufacturers.

The test period must allow for at least five uses of the test product and the reference product[74]. Each use should be performed as the test person or test centre would normally use his/her product in terms of frequency.

The dosages used must be the dosage recommended by the manufacturers. If a range is provided, the most restrictive (lower end) dosage shall be used.

2.3. Testing requirements (methods and evaluation)

Effectiveness of the product under test must be assessed based on its ability to remove soil (and, if tested, fat) and leave a clean surface.

The test persons must reply to the question 'How effective do you consider the test product to be compared to the product you normally use (considered as the reference product)?' or equivalent. At least three possibilities for a response must be available (e.g. 'poorer', 'as good as' and 'better').

For products containing microorganisms (*microbial cleaning products)* with a claim of *"long-lasting", "residual cleaning"* or equivalent, the test persons must reply to specific questions to rate (as previously stated) and describe (e.g. ability to degrade different type of soiling) such effects.

At least 80% of the testers for non-professional products or 5 test centres for professional products must assess the test product to be 'as good as' or 'better' than the product normally used (i.e. reference product), meaning >12 months of continuous usage.

2.4. Documentation requirements

A detailed test report shall be provided to the competent body, including the following information/documentation on:

— The description of the selection of the testers ~~(randomly for non-professional grade products)~~ or the test centres and a description of the sampling method chosen and how it was performed.

— The information provided by the testers or test centres and a summary describing how the testing was performed.

[73] Note to Competent Bodies: A database with the marketed reference products that have been approved by the different Competent Bodies (CBs) can be found in CIRCA (only accessible to CBs).

[74] ~~Each use should be performed as the test person or test centre would normally use his/her product in terms of frequency.~~

- The type of surface(s) the product was tested on.
- The duration and frequency of use of the product and dosage used.
- The guidance given to the testers.
- Calculations and documentation showing that at least 80 % of the testers or 5 test centres assess the product to be as good as or better than the reference product.
- A declaration from the testers or the test centres providing information on the product that they normally use and that served as the reference product.
- The label and technical sheet of the reference product to check its compliance with the requirements set out of for the reference product: type (e.g. RTU, undiluted product), purpose (e.g. WC cleaner, kitchen cleaner, sanitary cleaner, flooring cleaner, window cleaner) and the type(s) of surfaces it can clean.
- For each tester or test centre, the following information must be available, e.g. in the form of answers to a questionnaire:
    - The dosage used by the tester or test centre,
    - A statement declaring that the test and reference product have been tested and compared at least five times,
    - The result of the comparison of the test product and the reference product.

In addition to the previous general reporting requirements, if a test product has any other claim on the performance the product the following requirements also apply:

- Description of the claim made about performance as displayed in the packaging, inclusive literal wording/content used (e.g. quoting literal sentences; adding pictures).
- Detailed description of the test procedure/methods used for each of the performance effects tested and justification on how each is suitable/relevant for testing a specific performance effect. Specifically, for products containing microorganisms (*microbial cleaning products)* with a claim of *"long-lasting"* (or equivalent), it shall be related to the responses obtained with the specific questions made associated to this claim.

3. References

SOFW-Journal 126, 11-2000, 'Recommendation for the quality assessment of acidic toilet cleaners, SOFW-Journal, 126, pp 50-56, 2000

SOFW-Journal 129, 11-2003 'Recommendation for the quality assessment of bathroom cleaners, SOFW-Journal, 129, pp 42-48, 2003

SOFW-Journal 130, 54-2005 'Recommendation for the quality assessment of the product performance of all-purpose cleaners', SOFW-Journal, 130, pp 54-66, 2005

SOFW-Journal 141, 6-2015, 'IKW Recommendation for the quality assessment of product performance of all-purpose cleaners 2014, SOFW-Journal, 141, pp 47-56, 2015

SOFW-Journal 148, 4-2022 -> IKW "Recommendation for the Quality Assessment of Glass Cleaning Agents / Glass Cleaners"; SOFW-Journal, 148, pp 26-35, April 2022

DE-UZ 194, v1.2, Blue Angel, Basic award criteria "*DE-UZ 194. Hand dishwashing detergents and hard-surface cleaners",* v1.2. January 2022

Annex 1: Example of reporting template

A template for reporting the description of the procedures and the results of the tests are available here XXXX (~~http://ec.europa.eu/environment/ecolabel/documents/HSC.xlsx~~). This template is not mandatory to show compliance with Criterion X, "Fitness for use".