Framework for testing performance for hard surface cleaning products

Content

0. Background

This test protocol serves as a proof to show compliance with the criterion "fitness for use" of the Commission Decision xxx/EC establishing EU Ecolabel criteria for "Hard surface cleaners".

The test is for products that fall under the scope of the product group "Hard surface cleaners", this means cleaners 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 performance test can be conducted through a laboratory test or a user test. In addition to the performance test, it is the responsibility of the applicant to ensure that the cleaner is safe to use on the intended surface(s). The conditions for both types of test are described in the following sections

1. Laboratory test

The aim of the laboratory test is to confirm that the test product cleans equal to or better than a comparative reference product or a reference generic formulation. Products should be tested in their "undiluted form" and "ready-to-use (RTU)" form at the recommended dosage for normal soil or normal use.

1.1 Laboratory requirements

The manufacturer's 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 ecolabel organizations to monitor the performance of testing
- the ecolabel organisation must have access to all data on the product
- the samples must be made anonymous for the test laboratory

- performance of the effectiveness test must be described in the quality control system

1.2. Reference product

- The test product and the reference product shall be of the same product category (designed for the same use e.g. WC cleaners, kitchen cleaners, sanitary cleaners, flooring cleaners, window cleaners, etc.) and in the same form (RTU, undiluted, concentrated, etc.).
- A marketed product can be chosen as a reference product. A marketed product is understood as a product that is available for purchasing at that time and the intended market region. If a marketed product is chosen as a comparative reference product (e.g. for all purpose cleaners or for window cleaners), it shall be one present in the region, where the Ecolabel product is to be marketed. The marketed product must be approved by the competent body, and the trade name must be available in the test report.
- A generic composition not included in Table 1 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 competent body and
  - the exact formulation is publicly available free of charge.

Table 1 shows several generic formulations that can be used as reference products for some cleaners:

Table 1. Generic formulations that can 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	
Hostapur SAS 60	1	Hoechst
Rheozan	0,23	Rhodia
Tap water	Add 100	
Preparation and observations: Have tap water ready, slowly add Rheozan and stir with the dissolver for 30min until completely dissolved. Then add citric acid and alkane sulphonate. Do not use for at least 12h after preparation. The following physic-chemical parameters must be complied with: Viscosity: 550mPass ± 50 (Brookfield 20C, spindle, 2.20 RPM) Viscosity adjustment by adding Rheozan		
Bathroom cleaner **Source: Recommendation for the quality assessment of bathroom cleaners (SOFW-journal 129, 11, 2003)**		
Ingredient	**% Composition**	**CAS n., specification**
Citric acid monohydrate	4	
Hostapur SAS 60	1	Hoechst
Tap water	Add 100	
Preparation and observations: If bathroom cleaners are testing according to IKW-test "recommendation for the quality assessment of acidic toilet cleaners (SOFW- journal 126, 11, pp 50-56, 2000), the IKW reference cleaner for toilet cleaners can be used as a reference product, provided the pH of the reference is adjusted to 3.5		
All-purpose cleaners **Source: Recommendation for the quality assessment of all purpose cleaners (SOFW-journal 141, 6, 2015)**		
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}	4	Edenor K12-18
Fatty alcohol ethoxylate C_{12-18}, 7EO	4	Dehydol LT 7
Fatty alcohol ether sulfate C_{12-14}, 2EO Na salt	4,29	Texapon N70
Methylisothiazoline/benzisothiazolinone	0,1	Acticide MBR1
Water, fully demineralized	add 100	
Preparation and observations: Take approx. ¾ of the water as a basis, add 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, add remaining water, stir for 10 min Appearance: yellowish, clear		

1.3 Dosage

Dosages used shall be as follows:

1.3.1.a) Undiluted products:

- *Cleaning performance in undiluted form:* Cleaners, even those to also be used in diluted form, e.g. for floor cleaning, should in the lab be tested in their undiluted form. This is the way they are used on tough soils in the end user facilities, and in this way also relevant discrimination between products can be obtained in the lab.

- *Clear drying and streak formation performance in diluted form:* The dosages used shall be the recommended dosage for normal soil or normal use. If no recommended dosage is stated for the reference product, the same dosage must be used for both the test product and the reference product. If a dosage interval is given, the lowest recommended dosage must be used in the test.

1.3.1.b) Ready to use products:

- *Clear drying and streak formation performance in diluted form:* The dosages used shall be the recommended dosage for normal soil or normal use. If no recommended dosage is stated for the reference product, the same dosage must be used for both the test product and the reference product. If a dosage interval is given, the lowest recommended dosage must be used in the test.

1.4. 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 test method to determine the cleaning performance of the undiluted product is based on one or several soils depending on the type of product, as specified in Table 2.

Table 2. Soil mixture to be tested for each type of product

Product	Soiling mixture	Preparation of the soiling - Source
Bathroom cleaners	Particulate matter	SOFW-Journal 126,11-2000
	Descaling: lime soap and limescale	SOFW-Journal 129, 11-2003
Toilet cleaners	Particulate matter	SOFW-Journal 126,11-2000
	Descaling: limescale	SOFW-Journal 129, 11-2003
Kitchen cleaners	Fat removing	SOFW-Journal 141, 6-2015
	Particulate matter	
	Descaling: limescale	SOFW-Journal 129, 11-2003

All-purpose cleaners	Fat removing	SOFW-Journal 141, 6-2015
	Particulate matter	
Window cleaners	Light fat removing	SOFW-Journal 141, 6-2015
	Particulate matter	
	Strip-less drying	SOFW-Journal 141, 6-2015 Section 5b)

1.5. Procedure and testing requirements

The cleaning procedure must reflect realistic use conditions and can be manual or by machinery

Each product must be tested in at least 5 repetitions. The order of testing of the products shall be randomised.

The quantity of soil applied to tiles or another substrate must be the same for each tile or substrate-part, weighed in grams to one decimal point.

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 (e.g. measuring reflectance), gravimetrically or by means of another relevant method. The method of measurement, including a possible scoring system, must be decided in advance.

The test product shall be diluted according to the manufacturer instructions with water 2,5mmol $CaCO_3$/l hard and homogenized. (Information about how to achieve this water hardness can be found in the preparation specification of SOFW-Journal 141, 6-2015). Cleaner dilutions may be used at most for one working day. Prior to further use they must be again homogenised.

Table 3. Procedure for testing the cleaning performance of the different products

Product	Type of testing	Procedure - Source
Bathroom cleaners (RTU)	Limescale removal properties tested on: horizontal and vertical surfaces	SOFW-Journal 129, 11-2003
Bathroom cleaners concentrated	Limescale removal properties for concentrated products	SOFW-Journal 129, 11-2003
Toilet cleaners	In-use test values	SOFW-Journal 126, 11-2000
Kitchen cleaners	Descaling: lime soap and limescale	SOFW-Journal 129, 11-2003
	Cleaning performance in concentrated use (APC)	SOFW Journal 141, 6-2015
All-purpose cleaners	Cleaning performance in concentrated use Clear drying and streak formation	SOFW-Journal 141, 6-2015
Window cleaners	Clear drying and streak formation	

1.6 Assessment

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. 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 positive. In case lime scale removal is tested for an acidic toilet cleaner versus the above specified reference product, a positive outcome of the test is associated with a performance that reaches at least a ratio of 0.7 of that of the reference cleaner.

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 or better than the reference product.

Table 4. Procedure 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 141, 6-2015
All purpose cleaners	SOFW-Journal 141, 6-2015
Window cleaners	Test window cleaner product should be as good as a reference product and better than water of a defined hardness.
	SOFW-Journal 141, 6-2015 Section 5b)

1.7 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 products. If any of the generic formulation provided in Table 1 is not used, justification of the choice of the reference product.
- Description of the dosages used for the testing 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 testing product.
- Description of the procedures for adding the soil to the substrate.
- Description of how the cleaning capacity was measured and raw data from all repetitions stated in terms of cleaning capacity.
- All raw data used in the testing and calculations and statistical evaluation of the data, if applicable.

2. User test

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

2.1 Selection of the test centres or testers

For testing of non-industrial and non–institutional (non-II) products, responses must be received from a minimum of 80 persons, randomly selected in the sales region and normally using the reference product.

For testing of industrial and institutional products, responses must be received from at least 5 professional users, randomly selected in the sales region and normally using the reference.

2.2 Procedure, dosage and reference products

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

The test period must allow for at least five uses of the test product.

The dosages used must be the dose recommended by the manufacturer.

The test product and the reference product should be of the same product category (e.g. RTU, undiluted product, etc.) and designed for the same purpose (WC cleaners, kitchen cleaners, sanitary cleaners, flooring cleaners, window cleaners, etc.)

2.3 Testing requirements (methods and evaluation)

Effectiveness of the product under test must be assessed on the ability of the product to remove soil 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?' or equivalent. At least three possibilities for a response must be available, e.g. 'poorer', 'as good as' and 'better'.

At least 80% of the testers or professional users must assess the product to be 'as good as' or 'better' than the reference product.

2.4 Documentation requirements

A detailed test report including information/documentation on:

- The selection of the testers or test centers

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

- The type of surface(s) the product was tested on.

- Calculation and documentation showing that at least 80 % of the test persons or professional users assess the product to be as good as or better than the reference product.

- For each test person or professional user, the following information must be available, e.g. in the form of answers to a questionnaire:

  - The dosage used by the test person or the professional user
  - The name of the reference product
  - A statement declaring that the product has been tested at least five times
  - The result of the comparison of the test product and the reference product.

Link to the excel sheet