COSMETICS

Cosmetics & Toiletries Proficiency Testing Scheme

Scheme Description

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Record of issue status and modifications

ISSUE	ISSUE DATE	DETAILS	AUTHORISED BY
7	June 2015	New analytes added to samples 19, 20 and 21. Methods included for chemistry samples. Viscosity range updated.	M. Whetton
8	Jan 2016	Method list updated for test materials 24 and 25. Addition of a new sample 27 for determination of preservatives in cosmetics. Assigned value and range updated for test material 19, 20 and 21. SDPA amended for pH and density in sample 23. New microbiology analytes added across two samples instead of one (10A, 10B, 13A, 13B, 16A, 16B). Removed Hard copy report information	M. Whetton R. Smith A. McCarthy
9	Jan 2017	Method list updated for test materials 19-21, 24 and 25. Inclusion of new samples 28 and 29. Change to the range for Zn in sample 25.	K. Baryla
10	May 2017	The units standardized for samples 27, 28 and 29 Removed sample 26	K. Baryla A.McCarthy
11	Dec 2018	Updated methods section for Micro samples. Added sample 30 - Microbial Challenge Test Website information added to page 3	R.Smith A McCarthy
12	Nov 2019	Added two new samples: preservatives in mascara (31) and chemical analysis of liquid detergents (32)	R. Connolly S. Xystouris
13	Sep 2020	Removed Fax number and Hard copy report info	A McCarthy
14	Feb 2021	Added 2 new samples (33 - Hand sanitiser and 34 - Face masks)	R. Connolly
15	July 2021	Updated email address and UKAS logo	A Collins
16	July 2022	Added new sample 35, increased sample volume for sample 23. Removed % reduction analyte for sample 30	S. Xystouris T.Noblett
17	Sept 2023	Update of units for sample 32 to % w/w Amended SDPA for sample 30 SDPA for 24 and 25 updated Enumeration and Detection tests separated in microbiology tables. AV, Reporting Units and DP updated. 'Range' column updated to include units 'Units' changed to 'Reporting Units' to match PORTAL	L. Fielding A.S. Eden R. Connolly T. Ashcroft

Notes:
Where this document has been translated, the English version shall remain the definitive version

Scheme Aims and Organisation
The primary aim of the Cosmetics & Toiletries Proficiency Testing Scheme (COSMETICS) is to enable laboratories performing the analysis of cosmetic and toiletries to monitor their performance and compare it with that of their peers. The COSMETICS Scheme also aims to provide information to participants on technical issues and methodologies relating to testing of cosmetics/toiletries and related products.

The COSMETICS scheme year operates from January to December. Further information about COSMETICS, including test material availability, round despatch dates and reporting deadlines, are available on the current COSMETICS application form and on the website www.lgcstandards.com.

Test Materials
Details of the test materials available are given in Appendix A. The test parameters are continually reviewed to ensure they meet the needs of current laboratory testing and regulatory requirements.

Test material batches are tested for homogeneity for at least one test parameter where deemed appropriate. Details of homogeneity tests performed and results are given in the COSMETICS scheme reports.

Some aspects of the scheme, such as test material production, homogeneity testing and stability assessment, can from time to time be subcontracted. When subcontracting occurs, it is placed with a competent subcontractor and LGC is responsible for this work. The planning of the scheme, the evaluation of performance and the authorisation of the final report will never be subcontracted.

Statistical Analysis
Information on the statistics used can be found in the General Protocol and in the Scheme Report. Methods for determining assigned values and the values for SDPA used for individual samples are given in Appendix A.

Methods
Methods are listed in PORTAL. Please select the most appropriate method from the list. If none of the methods are appropriate, then please report your method as ‘Other’ and record a brief description in the Comments Section in PORTAL.
The time and temperature of incubation does not need to be reported.

Results and Reports
Results are returned through our electronic reporting software, PORTAL, full instructions for which are provided by email.

Reports will be available on the website within 10 working days of round closure. Participants will be emailed a link to the report when it is available.

APPENDIX A - Description of abbreviations used

Assigned Value (AV)

The assigned value may be derived in the following ways:

- From the robust mean (median) of participant results (RMean). This is the median of participant results after the removal of test results that are inappropriate for statistical evaluation, e.g. miscalculations, transpositions and other gross errors. Generally, the assigned value will be set using results from all methods, unless the measurement is considered method-dependant, in which case the assigned value will be set by method as illustrated in the report tables.
  For some analytes, where there is a recognised reference method for that type of measurement, this may be used as the assigned value for a particular analyte i.e. it would be applied to results obtained by any method.

  Traceability: Assigned values which are derived from the participant results, or a sub-set of the results are not traceable to an international measurement standard. The uncertainty of assigned values derived in this way is estimated from the participant results, according to ISO 13528.

- From a formulation value (Formulation). This denotes the use of an assigned value derived from sample preparation details, where known and exact quantities of analyte have been used to prepare the sample.

  Traceability: Assigned values calculated from the formulation of the test sample are traceable, via an unbroken metrological traceability chain, to an international measurement standard. The measurement uncertainty of the assigned value is calculated using the contributions from each calibration in the traceability chain.

- From a qualitative formulation (Qual Form). This applies to qualitative tests where the assigned value is simply based on the presence/absence of the analyte in the test material.

  Traceability: Assigned values calculated from the qualitative formulation of the test sample are traceable to a certified reference standard or a microbiological reference strain.

- From expert labs (Expert). The assigned value for the analyte is provided by an ‘expert’ laboratory.

  Traceability: Assigned values provided by an ‘expert’ laboratory may be traceable to an international measurement standard, according to the laboratory and the method used. The uncertainty of measurement for an assigned value produced in this way will be provided by the laboratory undertaking the analysis. Details of traceability and the associated uncertainty will be provided in the report for the scheme/round.

Range

This indicates the concentration range at which the analyte may be present in the test material.

SDPA

SDPA represents the ‘standard deviation for proficiency assessment’ which is used to assess participant performance for the measurement of each analyte. This may be a fixed value (as stated), a percentage (%) of the assigned value or based on the robust standard deviation of the participant measurement results, either across all methods or by method depending on whether the measurement made is method dependent (see assigned value).

Units
This indicates the units used for the assessment of data. These are the units in which participants should report their results. For some analytes in some schemes participants may have a choice of which units to report their results, however, the units stipulated in this scheme description are the default units to which any results reported using allowable alternative results will be converted to.

DP
This indicates the number of decimal places to which participants should report their measurement results.

Microbiological samples

Samples PT-CS-10A;13A;16A **Microbiological Analysis of Cosmetics and Toiletries for TAMC and indicator organisms**
Supplied as: 1 x 10mL or gram of matrix (10A=powder, 13A=cream, 16A=liquid) plus a 10mL glass sealed vial containing lyophilised microorganism(s).

Analyte	Method	AV	Range cfu/ml or cfu/g	SDPA	Reporting Units	DP
Enumeration of aerobic mesophilic bacteria	All	RMean	0 to 100,000	$\log_{10}$ 0.35	cfu/ml or cfu/g	0
Detection of aerobic mesophilic bacteria	All	Qual Form	0 to 100,000	NA	Detected/Not Detected 10ml or 10g	NA
Enumeration of *Staphylococcus aureus*	All	RMean	0 to 100,000	$\log_{10}$ 0.35	cfu/ml or cfu/g	0
Detection of *Staphylococcus aureus*	All	Qual Form	0 to 100,000	NA	Detected/Not Detected 10ml or 10g	NA
Enumeration of Enterobacteriaceae	All	RMean	0 to 100,000	$\log_{10}$ 0.35	cfu/ml or cfu/g	0
Detection of *Escherichia coli*	All	Qual Form	0 to 100,000	NA	Detected/Not Detected 10ml or 10g	NA

Samples PT-CS-10B;13B;16B **Microbiological Analysis of Cosmetics and Toiletries for enumeration of yeast, mould and pseudomonas**
Supplied as: 1 x 10mL or gram of matrix (10B=powder, 13B=cream, 16B=liquid) plus a 10mL glass sealed vial containing lyophilised microorganism(s).

Analyte	Method	AV	Range cfu/ml or cfu/g	SDPA	Reporting Units	DP
Enumeration of yeast and mould (total count)	All	RMean	0 to 100,000	$\log_{10}$ 0.35	cfu/ml or cfu/g	0
Detection of *Candida albicans*	All	Qual Form	0 to 100,000	NA	Detected/Not Detected 10ml or 10g	NA
Enumeration of *Pseudomonas aeruginosa*	All	RMean	0 to 100,000	$\log_{10}$ 0.35	cfu/ml or cfu/g	0
Detection of *Pseudomonas aeruginosa*	All	Qual Form	0 to 100,000	NA	Detected/Not Detected 10ml or 10g	NA
Detection of *Burkholderia cepacia*	All	Qual Form	0 to 100,000	NA	Detected/Not Detected 10ml or 10g	NA

Sample PT-CS-30** **Microbial Challenge Test (Preservative efficacy testing)**
Supplied as: 1 x 10mL or gram of matrix plus 1 x 10mL glass sealed vial containing lyophilised microorganism(s) Selected from: *Staphylococcus aureus, Candida albicans, Aspergillus brasiliensis, Escherichia coli* and/or *Pseudomonas aeruginosa*

Analyte	Method	AV	Range cfu/g	SDPA	Reporting Units	DP
Microbial enumeration	All	RMean	All	Greater of Robust SD or 0.5 log_{10}	cfu/g	0
Log_{10} reduction in microbial load	All	RMean	All	Greater of Robust SD or 0.5 log_{10}	Log_{10}	0

**Test material currently not included in LGC's UKAS Scope of Accreditation.

Chemistry samples

Sample PT-CS-19 **Trace Elements in Lipstick**
Supplied as: 1 x 5g lipstick sample

Analyte	Method	AV	Range	SDPA	Units	DP
Cadmium	ICP-MS ICP-OES AAS X-ray fluorescence GFAAS FLAAS	RMean	0-50	10%	mg/kg	2
Chromium						
Lead						
Nickel						
Arsenic*						
Mercury*						

Sample PT-CS-20 **Trace Elements in Lip Gloss**
Supplied as: 1 x 5g lip gloss sample

Analyte	Method	AV	Range	SDPA	Units	DP
Cadmium	ICP-MS ICP-OES AAS X-ray fluorescence GFAAS FLAAS	RMean	0-50	10%	mg/kg	2
Chromium						
Lead						
Nickel						
Arsenic*						
Mercury*						

Sample PT-CS-21 **Trace Elements in Powdered Cosmetics**
Supplied as: 1 x 5g powder sample (e.g. eyeshadow, etc)

Analyte	Method	AV	Range	SDPA	Units	DP
Cadmium	ICP-MS ICP-OES AAS X-ray fluorescence GFAAS FLAAS	RMean	0-50	10%	mg/kg	2
Chromium						
Lead						
Nickel						
Arsenic*						
Mercury*						

*analytes marked with an asterisk are not included in LGC's UKAS scope of accreditation

Sample PT-CS-22 **Chemical Analysis of Cream Cosmetics**
Supplied as: 1 x 5mL cream sample

Analyte	Method	AV	Range	SDPA	Units	DP
Hydroquinone	HPLC	RMean	0-4	10%	% (w/w)	2
	Spectrophotometric					

Sample PT-CS-23 **Physicochemical Analyses of Liquid Cosmetics**
Supplied as: 1 x 500mL liquid cosmetic sample

Analyte	Method	AV	Range	SDPA	Units	DP
pH	pH meter	RMean	5-9	0.1	-	2
Viscosity	Rotary viscometer	RMean	1000-12000	Robust SD	mPa.s	0
	Capillary method					
Density	Pycnometer	RMean	0.95-1.05	0.002	g/cm^3	4
	Density meter					

Sample PT-CS-24* **Trace Elements in Mouthwash**
Supplied as: 1 x 125mL mouthwash sample

Analyte	Method	AV	Range	SDPA	Units	DP
Antimony	ICP-MS ICP-OES AAS X-ray fluorescence Ion selective electrode HPLC-IC GFAAS FLAAS	RMean	0-20	10%	mg/L	2
Arsenic			0-20		mg/L	2
Barium			0-20		mg/L	2
Copper			0-20		mg/L	2
Fluoride			0-1		% (w/v)	3
Mercury			0-20		mg/L	2
Selenium			0-20		mg/L	2
Zinc			0-20		mg/L	2

Sample PT-CS-25* **Trace Elements in Toothpaste**
Supplied as: 1 x 25g toothpaste sample

Analyte	Method	AV	Range	SDPA	Units	DP
Antimony	ICP-MS ICP-OES AAS X-ray fluorescence Ion selective electrode HPLC-IC GFAAS FLAAS	RMean	0-20	10%	mg/kg	2
Arsenic			0-20		mg/kg	2
Barium			0-20		mg/kg	2
Copper			0-20		mg/kg	2
Fluoride			0-0.5		% (w/w)	3
Mercury			0-20		mg/kg	2
Selenium			0-20		mg/kg	2
Zinc			0-2000		mg/kg	2

Sample PT-CS-27* **Preservatives in cream**
Supplied as: 1 x 25mL cream sample

Analyte	Method	AV	Range	SDPA	Units	DP
Methylparaben	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3
Propylparaben	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3
Butylparaben	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3
Benzoic acid	HPLC	RMean	0 - 5	Robust SD	% (w/w)	3
Sorbic acid	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3

Sample PT-CS-28* **Chemical analysis of soaps**
Supplied as: 1 x 100g liquid or solid soap

Analyte	Method	AV	Range	SDPA	Units	DP
Chlorides (as Cl^-)	ASTM D460	RMean	All	Robust SD	% (w/w)	2
	ISO 457					
	ISO 4323					
	AOCS					
Free caustic alkali (as NaOH)	ASTM D460	RMean	All	Robust SD	% (w/w)	2
	ISO 456					
	AOCS					
Free fatty acids (as oleic acid)	ASTM D460	RMean	All	Robust SD	% (w/w)	2
	GC-MS					
	AOCS					
Matter insoluble in ethanol	ASTM D460	RMean	All	Robust SD	% (w/w)	2
	ISO 673					
	AOCS					
Moisture and volatile matter	ASTM D460	RMean	All	Robust SD	% (w/w)	2
	ISO 672					
	AOCS					
Total fatty matter content	ASTM D460	RMean	All	Robust SD	% (w/w)	2
	ISO 685					
	AOCS					

Sample PT-CS-29* **Chemical analysis of powder detergents**
Supplied as: 1 x 100g powder detergent

Analyte	Method	AV	Range	SDPA	Units	DP
Water insoluble matter	Various	RMean	All	Robust SD	% (w/w)	2
pH (1% aqueous solution at 25˚C)	pH meter	RMean	All	Robust SD	-	2
Moisture and volatile matter	Oven	RMean	All	Robust SD	% (w/w)	2
Anionic-active matter	ISO 2271	RMean	All	Robust SD	% (w/w)	2
Cationic-active matter	ISO 2871	RMean	All	Robust SD	% (w/w)	2
Chlorides (as Cl^-)	ASTM D1681	RMean	All	Robust SD	% (w/w)	2

Sample PT-CS-31* **Preservatives in Mascara**
Supplied as: 1 x 5g mascara sample

Analyte	Method	AV	Range	SDPA	Units	DP
Methylparaben	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3
Propylparaben	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3
Butylparaben	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3
Benzoic acid	HPLC	RMean	0 - 5	Robust SD	% (w/w)	3
Sorbic acid	HPLC	RMean	0 - 1	Robust SD	% (w/w)	3

Sample PT-CS-32* **Chemical analysis of liquid detergents**
Supplied as: 1 x 100mL liquid detergent

Analyte	Method	AV	Range	SDPA	Units	DP
Water insoluble matter	Various	RMean	All	Robust SD	% (w/w)	2
pH (1% aqueous solution at 25˚C)	pH meter	RMean	All	Robust SD	-	2
Moisture and volatile matter	Oven	RMean	All	Robust SD	% (w/w)	2
Anionic-active matter	ISO 2271, ASTM D1681	RMean	All	Robust SD	% (w/w)	2
Cationic-active matter	ISO 2871	RMean	All	Robust SD	% (w/w)	2
Chlorides (as Cl^-)	Various	RMean	All	Robust SD	% (w/w)	3
Phosphates (as PO_4^{3-})	Various	RMean	All	Robust SD	% (w/w)	3

Sample PT-CS-33* **Quality of Hand Sanitiser**
Supplied as: 1 x 50mL liquid hand sanitiser

Analyte	Method	AV	Range	SDPA	Units	DP
Alcohol content	EN 14885 GC FT-IR UV	RMean	All	Robust SD	% (v/v)	2

Sample PT-CS-34* **Quality of Face Masks**
Supplied as: 50 x face masks

Analyte	Method	AV	Range	SDPA	Units	DP
Bacterial filtration efficiency (BFE)	EN14683:2019 ASTM F2101	RMean	All	Robust SD	%	1
Differential pressure (Breathability)	EN14683:2019	RMean	All	Robust SD	Pa/cm^2	1
Microbial cleanliness (Bioburden)	ISO11737-1:2018 EN14683:2019	RMean	All	Robust SD	CFU/g	2
Fluid resistance to synthetic blood	ASTM 1862 ISO 22609	RMean	All	Robust SD	mmHg	0

Sample PT-CS-35* **Allergens in cosmetics e.g. fragrances**
Supplied as: The exact details of the material will be provided

Analyte	Method	AV	Range	SDPA	Units	DP
Allergenic compounds (26 from Appendix A)	GC-MS/MS, Other (please specify)	RMean	All	Robust SD	µg/g	0-2

The presence of the analytes is material dependent and not all analytes will be present in every round.

*Currently not included in LGC's UKAS Scope of Accreditation.

APPENDIX A

Substance	CAS Number
Amyl cinnamal	(CAS No 122-40-7)
Benzyl alcohol	(CAS No 100-51-6)
Cinnamyl alcohol	(CAS No 104-54-1)
Citral	(CAS No 5392-40-5)
Eugenol	(CAS No 97-53-0)
Hydroxy-citronellal	(CAS No 107-75-5)
Isoeugenol	(CAS No 97-54-1)
Amylcin-namyl alcohol	(CAS No 101-85-9)
Benzyl salicylate	(CAS No 118-58-1)
Cinnamal	(CAS No 104-55-2)
Coumarin	(CAS No 91-64-5)
Geraniol	(CAS No 106-24-1)
Hydroxyisohexyl 3-cyclohexene carboxaldehyde	(CAS No 31906-04-4)
Anisyl alcohol	(CAS No 105-13-5)
Benzyl cinnamate	(CAS No 103-41-3)
Farnesol	(CAS No 4602-84-0)
2-(4-tert-butylbenzyl) propionaldehyde	(CAS No 80-54-6)
Linalool	(CAS No 78-70-6)
Benzyl benzoate	(CAS No 120-51-4)
Citronellol	(CAS No 106-22-9)
Hexyl cinnamic aldehyde	(CAS No 101-86-0)
d-Limonene	(CAS No 5989-27-5)
Methyl heptin carbonate	(CAS No 111-12-6)
3-Methyl-4-(2,6,6-tri-methyl-2-cyclohexen-1-yl)-3-buten-2-one	(CAS No 127-51-5)
Oak moss and treemoss extract	(CAS No 90028-68-55)
Treemoss extract	(CAS No 90028-67-4)