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*Review*

# Legislative Aspects of Cosmetic Safety in the European Union: The Case of Contact Allergy

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**Abstract:** For several decades, the European Union (EU) has amongst its many tenets and principles the aim, enshrined in an EU Directive, that cosmetic products should not cause harm to the consumer. To a great extent, this is been successful, although it is noteworthy that the frequency of contact allergy to a number of ingredients commonly found in cosmetics has remained stubbornly high. Perhaps because of this, but certainly because of the drive by the European Commission towards better, more streamlined, regulation, the Directive was recast into a Regulation, usually referred to as the EU Cosmetics Regulation ((EC) No 1223/2009). As with the Directive, for each and every cosmetic product placed on the consumer market in the EU, a safety assessment is required. The Regulation requires that a dossier is prepared detailing the composition of the product, the safety of each of its ingredients, as well as an evaluation of overall product safety. This has to be completed by suitably trained and qualified assessors. Also relevant to cosmetic products are the general regulations pertaining to chemicals used in the EU where again many details of the toxicological profile must be ascertained and reviewed. On this basis, it should be possible to ensure that the extent of contact allergy attributed to cosmetic products declines. However, legislation is one thing, but it is also necessary to ensure that the cosmetic industry safety assessment process is completed in a rigourous manner (or even done at all) and that demands enforcement of the legislation.

**Keywords:** cosmetic safety; European legislation; contact allergy

## 1. Introduction

In the last few years, Europe has updated its approach to cosmetic safety by recasting the now 40 year old EU Cosmetics Directive (Directive 76/768/EEC) into the simpler, EU Regulation 1223/2009 which was fully applicable from July 2013 [1]. This forms part of the smart regulations initiative, including general "maintenance" activities [2]. One benefit is that the introduction of Regulation EC No 1223/2009 on cosmetic products, instead of the Directive 76/768/EEC, means that the same (translated into national languages) legal text became binding in all member states, and thus at least one major simplification is achieved for the EU market: the 28 national legal frameworks for the directive are substituted with the regulation. With respect to consumer safety, the regulation states "A cosmetic product made available on the market shall be safe for human health when used under normal or reasonably foreseeable conditions of use...". In this respect, the intention does not differ from that of the preceding Directive. There are several other requirements built into the regulation, but for the purposes of this account, we have focused only on the aspects that pertain to consumer safety, and in particular contact allergy. Nevertheless, it is fair to recognize that with this regulation, Europe offers the most highly developed legislation concerning cosmetics, consumer safety in general and contact dermatitis in particular. Of course, the regulation is just one part of the entity; it requires also that

those placing products onto the market abide by the legislation and do their utmost to develop safe cosmetics, an activity that can only be assured if there is adequate regulatory oversight and monitoring.

A second piece of European legislation also has an impact on the safety of cosmetic ingredients, and that is the Regulation, Evaluation and Authorisation of Chemicals, usually referred to simply as REACH [3]. This will not be reviewed in detail here, almost all substances used (in almost any quantity) in the EU are subject to this regulation, whose aim is to ensure human (including occupational) and environmental safety. There are a number of exceptions, including a few common substances (e.g., water) and some natural materials; guidance on this can be found via the European Chemicals Agency.

## 2. The Requirements of the EU Regulation

The EU Cosmetics Regulation 1223/2009 and much related material can be found via this weblink [4]. The European trade associations impacted by this legislation include the European Federation for Cosmetic Ingredients (EFfCI) and Cosmetics Europe; their websites have specific pages detailing the import of the legislation, as well as practical guidance to manufacturers on how to deal with it [5,6].

The EU Cosmetics Regulation has several annexes: Annex I details the required content of the Cosmetic Product Safety Report. This is set out verbatim below since it offers a very clear outline of what the safety assessment must encompass and properly document.

"The cosmetic product safety report shall, as a minimum, contain the following:

**PART A—Cosmetic product safety information**

1. Quantitative and qualitative composition of the cosmetic product

The qualitative and quantitative composition of the cosmetic product, including chemical identity of the substances (incl. chemical name, INCI, CAS, EINECS/ELINCS, where possible) and their intended function. In the case of perfume and aromatic compositions, description of the name and code number of the composition and the identity of the supplier.

2. Physical/chemical characteristics and stability of the cosmetic product

The physical and chemical characteristics of the substances or mixtures, as well as the cosmetic product.

The stability of the cosmetics product under reasonably foreseeable storage conditions.

3. Microbiological quality

The microbiological specifications of the substance or mixture and the cosmetic product. Particular attention shall be paid to cosmetics used around the eyes, on mucous membranes in general, on damaged skin, on children under three years of age, on elderly people and persons showing compromised immune responses.

Results of preservation challenge test.

4. Impurities, traces, information about the packaging material

The purity of the substances and mixtures.

In the case of traces of prohibited substances, evidence for their technical unavoidability.

The relevant characteristics of packaging material, in particular purity and stability.

5. Normal and reasonably foreseeable use

The normal and reasonably foreseeable use of the product. The reasoning shall be justified in particular in the light of warnings and other explanations in the product labelling.

6. Exposure to the cosmetic product

Data on the exposure to cosmetic product taking into consideration the findings under Section 5 in relation to

1) The site(s) of application;
2) The surface area(s) of application;
3) The amount of product applied;
4) The duration and frequency of use;
5) The normal and reasonably foreseeable exposure route(s);
6) The targeted (or exposed) population(s). Potential exposure of a specific population shall also be taken into account.

The calculation of the exposure shall also take into consideration the toxicological effects to be considered (e.g., exposure might need to be calculated per unit area of skin or per unit of body weight). The possibility of secondary exposure by routes other than those resulting from direct application should also be considered (e.g., non-intended inhalation of sprays, non-intended ingestion of lip products, *etc.*).

Particular consideration shall be given to any possible impacts on exposure due to particle sizes.

7. Exposure to the substances

Data on the exposure to the substances contained in the cosmetic product for the relevant toxicological endpoints taking into account the information under Section 6.

8. Toxicological profile of the substances

Without prejudice to Article 18, the toxicological profile of substance contained in the cosmetic product for all relevant toxicological endpoints. A particular focus on local toxicity evaluation (skin and eye irritation), skin sensitisation, and in the case of UV absorption photo-induced toxicity shall be made.

All significant toxicological routes of absorption shall be considered as well as the systemic effects and margin of safety (MoS) based on a no observed adverse effects level (NOAEL) shall be calculated. The absence of these considerations shall be duly justified.

Particular consideration shall be given to any possible impacts on the toxicological profile due to

- particle sizes, including nanomaterials,
- impurities of the substances and raw material used, and
- interaction of substances.

Any read-across shall be duly substantiated and justified.

The source of information shall be clearly identified.

9. Undesirable effects and serious undesirable effects

All available data on the undesirable effects and serious undesirable effects to the cosmetic product or, where relevant, other cosmetic products. This includes statistical data.

10. Information on the cosmetic product

Other relevant information, e.g., existing studies from human volunteers or the duly confirmed and substantiated findings of risk assessments carried out in other relevant areas.

**PART B—Cosmetic product safety assessment**

1. Assessment conclusion

Statement on the safety of the cosmetic product in relation to Article 3.

2. Labelled warnings and instructions of use

Statement on the need to label any particular warnings and instructions of use in accordance with Article 19(1)(d).

3. Reasoning

Explanation of the scientific reasoning leading to the assessment conclusion set out under Section 1 and the statement set out under Section 2. This explanation shall be based on the descriptions set out under Part A. Where relevant, margins of safety shall be assessed and discussed.

There shall be inter alia a specific assessment for cosmetic products intended for use on children under the age of three and for cosmetic products intended exclusively for use in external intimate hygiene.

Possible interactions of the substances contained in the cosmetic product shall be assessed.

The consideration and non-consideration of the different toxicological profiles shall be duly justified.

Impacts of the stability on the safety of the cosmetic product shall be duly considered.

4. Assessor's credentials and approval of part B

Name and address of the safety assessor.
Proof of qualification of safety assessor.
Date and signature of safety assessor."

Annex II is a list of substances that are prohibited from use in cosmetic products available in Europe. Annex III tabulates substances that may be used subject to certain restrictions (such as for application to hair only, not for oral hygiene). Annex IV lists colouring agents, Annex V is the positive list of preservatives and Annex VI is the positive list of UV filters. Note that following detailed reviews of hair dye safety, hair dyes listed in Annex III may be used, but these are not exclusive, as others may still be used. The ultimate aim is to have a positive list of hair dyes which will be housed in Annex IV.

The cosmetic industry uses thousands of substances for which there is no specific restriction in the Regulation other than the requirement to be safe as used, with only a minority of ingredients being mentioned in these annexes. The European inventory of cosmetic ingredients (CosIng) is a non-exhaustive listing of them [7]. The requirement for each cosmetic product to have a complete list of ingredients was introduced in 1995 by the sixth amendment to the Cosmetic Directive, although fragrances were excluded, except for the need to use the word "parfum". However, specific content labelling of 26 fragrance allergens was introduced in March 2005 by the seventh amendment; labelling is required if any of the 26 fragrances is present at levels >10 ppm for leave-on products or >100 ppm for rinse-off products. The aim is that individuals who are already fragrance allergic have the opportunity to avoid exposure. It should be noted that the trigger levels for labelling were suggested by the European Parliament as a pragmatic solution, as truly safe levels for most fragrance allergens are largely unknown. The list of fragrance allergens that must be labelled has been reviewed [8].

Implementation of the scientific advice is thought to be imminent, despite being subject to a prolonged period of consultation.

Before a cosmetic ingredient is introduced to an annex in the Cosmetics Regulation, scientific evaluation must be provided by an independent European Commission advisory committee. Initially, this was known as the Scientific Committee for Cosmetology (SCC), but from 1997–2004 it became the Scientific Committee for Cosmetics and Non-Food Products (SCCNFP), then from 2004–2009 the Scientific Committee for Consumer Products (SCCP) and it is now designated the Scientifc Committee for Consumer Safety (SCCS). The opinions of this independent committee of experts have been made available on the European Commission website [9]. The SCCS also regularly updates its "Guidelines for the Safety Evaluation of Cosmetic Ingredients" to accommodate scientific and technological progress. The latest version of these guidelines can be found on the European Commission website here [10].

One of the most notable aspects of cosmetic ingredient and product evaluation in the EU is that, since 2013, it must not be completed using new *in vivo* experimentation on animals. However, for many ingredients, historic *in vivo* data exists. In addition, where ingredients have substantial use beyond the cosmetic industry, the requirements of REACH dictate that *in vivo* data is generated. Accordingly, the SCCS notes of guidance also cover this type of toxicological data in addition to *in vitro* and *in silico* methods. Thus, whether an ingredient is being evaluated by the SCCS or by a company toxicologist/safety assessor, a broad spectrum of *in vitro*, *in vivo*, and other data commonly still has to be assessed.

As noted above in Part B of the European requirements, whilst a cosmetic product must comply with all regulatory stipulations, it is necessary also that the safety of each cosmetic product (including that of the ingredients that have not been restricted) be assessed independently by an individual with appropriate expertise, formally designated "the assessor". This individual must be able to demonstrate the necessary qualifications and experience. Furthermore, each product must have an associated dossier containing technical details of the ingredients and a safety (toxicological) assessment of every ingredient as well as the final formulation placed on the consumer market.

## 3. REACH and the Classification, Labelling, and Packaging (CLP) Regulations

REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) details can be found on the EU website [3]. Although comprehensive in some respects, the large burden of responsbility for completion of a REACH assessment of chemicals and any subsequent risk assessment has, deliberately, been placed on industry, since it is their responsibility to place chemicals on the market in a safe manner. Only a small minority of assessments will be cross checked by members of the European Chemicals Agency (ECHA). To assist with the assessments, extensive guidance has been published and is updated from time to time to take account of toxicological progress, including in non-animal methods—see the website for detailed information [11].

Test methods for the identification of skin sensitizers are clearly set out within the legislation, but it also encourages a wide range of other evidence to be taken into account, including from chemical structure and human evidence. Toxicolgical evaluations follow the principles set out in the GHS (Globally Harmonised System), which endeavours to harmonise testing and assessment internationally, based largely on test guidelines developed under the auspices of the Organisation for Economic Cooperation and Development [12].

## 4. Specific Restrictions

As already mentioned above with respect to fragrance allergens, where the general regulation of cosmetic products is deemed to have been insufficiently effective, *ad hoc* specific restrictions may be applied. Thus, although there is, for example, a positive list for preservatives permitted in cosmetic products (Annex V), it has long been recognised that this category is associated with the causation of contact allergy [13]. Therefore, from time to time, despite prospective limits being applied, clinical evidence demonstrates the need for further action [14]. By this route, certain preservative

substances previously allowed in cosmetics have been subject to additional restriction, for example being discouraged in leave-on products [15]. It is not appropriate here to catalogue such restrictions (not least since all the information is readily available on the EU websites). However, what is evident is that, at least in principle, failure to assess the (contact allergy) risk to human health invites the parallel risk that the substance may become heavily restricted or banned entirely from cosmetics.

## 5. Discussion

What the short overview above has tried to demonstrate is that Europe has the most sophisticated legislation covering not only the safety of cosmetic products, but also that all of the ingredients from which such products are made. Furthermore, legislation requires that all aspects of the safety assessment for each and every cosmetic product is properly documented before the product is placed upon the consumer market. Consequently, it should be reasonable to assume that, in Europe at least, cosmetics will comply with the overriding requirement of the legislation that the products do not cause harm to the consumer. Sadly, and as indicated elsewhere in the special issue, we know that cosmetics indeed are one of the most important causes of contact allergy and allergic contact dermatitis. Given the quality and scope of the European legislation, it is hard to lay blame in how it has been drafted. It seems to these authors at least, that it must either be the quality of the safety assessment processes and/or how well the legislation is enforced. It is not the purpose of this particular article to engage to any extent in the detail of the debate on why such good legislation has so far proven so ineffective in controlling cosmetic contact allergy. Nevertheless, those carrying out at least that part of the safety of assessment process pertaining to skin sensitisation and those responsible for enforcing legislation both need to carry out a critical examination of what it is they do, or perhaps fail to do. We are well aware that one important supplier to the cosmetic industry (fragrances) has been conducting a detailed review of its quantitative risk assessment process [16,17]. Whether or not this will lead to a reduction in the frequency fragrance contact allergy remains to be seen, the proof being something that will arise for continued monitoring of data from contact allergy clinics around the world [18]. Although it has been encouraging to see the proactive guidance from the European Cosmetics Industry in response to recent problems [15], recent epidemics of preservative allergy, associated at least in part with leave-on cosmetic products, strongly suggests that there is further preventive work to do, probably both in the risk assessment area and in the enforcement of its conduct [14].

Europe has the legislation, it has the tools, but it remains to be seen whether it has the will to ensure that these are used to achieve the goal mentioned in the opening article of this series, that of making cosmetic contact allergy history [19].

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## References

1. Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on Cosmetic Products. Available online: http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A32009R1223 (accessed on 28 April 2016).
2. Better Regulation. Available online: http://ec.europa.eu/smart-regulation/index_en.htm (accessed on 28 April 2016).
3. Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC. Available online: http://www.hse.gov.uk/reach/resources/regulation.pdf (accessed on 21 April 2016).

4. European Commission. Legislation. Available online: http://ec.europa.eu/growth/sectors/cosmetics/legislation/index_en.htm (accessed on 28 April 2016).
5. Regulation and Safety. Available online: http://effci.com/regulation-and-safety/ (accessed on 28 April 2016).
6. The EU Legislation. Available online: https://www.cosmeticseurope.eu/safety-and-science-cosmetics-europe/rules-and-regulations/the-eu-legislation.html (accessed on 28 April 2016).
7. CosIng—Inventory of Ingredients. Available online: http://ec.europa.eu/growth/sectors/cosmetics/cosing/inventory/index_en.htm (accessed on 28 April 2016).
8. Scientific Committee on Consumer Safety. Opinion on Fragrance Allergens in Cosmetic Products. Available online: http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_102.pdf (accessed on 8 September 2015).
9. SCCS Opinions: Opinions Open for Comment. Available online: http://ec.europa.eu/health/ph_risk/committees/04_sccs/sccs_opinions_en.htm (accessed on 28 April 2016).
10. The SCCS Notes of Guidance for the Testing of Cosmetic Ingredients and Their Safety Evaluation. Available online: http://ec.europa.eu/health/scientific_committees/consumer_safety/docs/sccs_o_190.pdf (accessed on 28 April 2016).
11. Guidance on Information Requirements and Chemical Safety Assessment. Chapter R.7a: Endpoint Specific Guidance. Available online: http://echa.europa.eu/documents/10162/13632/information_requirements_r7a_en.pdf (accessed on 28 April 2016).
12. United Nations. Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Part 3: Health Hazards. 2013. Available online: www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev05/English/03e_part3.pdf (accessed on 20 October 2014).
13. Dillarstone, A. Cosmetic preservatives. *Contact Dermat.* **1997**, *37*, 190.
14. Schwensen, J.F.; White, I.R.; Thyssen, J.P.; Menné, T.; Johansen, J.D. Failures in risk assessment and risk management for cosmetic preservatives in Europe and the impact on public health. *Contact Dermat.* **2015**, *73*, 133–141. [CrossRef] [PubMed]
15. Cosmetics Europe Recommendation on use of MIT. Available online: https://www.cosmeticseurope.eu/news-a-events/news/686-cosmetics-europe-recommendation-on-use-of-mit-in-leave-on-on-s-cosmetics-products.html (accessed on 21 April 2016).
16. Basketter, D.A.; Safford, R.J. Skin sensitisation quantitative risk assessment: A review of underlying assumptions. *Regul. Toxicol. Pharmacol.* **2015**, *74*, 105–116. [CrossRef] [PubMed]
17. Safford, B.; Api, A.M.; Barratt, C.; Comiskey, D.; Daly, E.J.; Ellis, G.; McNamara, C.; O'Mahony, C.; Robison, S.; Smith, B.; *et al.* Use of an aggregate exposure model to estimate consumer exposure to fragrance ingredients in personal care and cosmetic products. *Regul. Toxicol. Pharmacol.* **2015**, *72*, 673–682. [CrossRef] [PubMed]
18. Basketter, D.A.; White, I.R.; McFadden, J.P.; Kimber, I. Skin sensitization: Integration of clinical data into hazard identification and risk assessment. *Human Exp. Toxicol.* **2015**, *34*, 1222–1230. [CrossRef] [PubMed]
19. Basketter, D.A.; Corsini, E. Can we make cosmetic contact allergy history? *Cosmetics* **2016**, *3*, 11. [CrossRef]