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# How to use EMAS for improved chemicals management: A Guide

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## CONTENTS

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# INTRODUCTION

Chemicals are used extensively in many business activities in both the manufacturing and service sectors. They can cause pollution of the environment in several ways: through emissions to air, water and soil. The use of chemicals as a source of environmental and safety concerns may be perceived as well recognised, but their (eco-toxic) impacts tend to be overlooked here, because the "classical pollutants", such as heavy metals (water) and SOx/NOx (air) dominated discussions about environmental impacts for a long time. In the case of chemicals, it is very important to consider their impacts in a broader context and not only during use or disposal along the whole supply chain.

Environmental management systems used by many business organisations allow for addressing environmental aspects that appear to be significant. This guide introduces the concept of a chemicals management system to organisations implementing and maintaining environmental management systems (EMS). It is based on the belief that the EMS principles can be successfully applied to the management of chemicals and that linking the two concepts will ensure benefits for the organisation and the environment.

This guide is mainly intended for users of chemicals including formulators of mixtures, producers of articles or service providers. Substance manufacturers are not the primary target group, but can also get inspiration for their chemicals management from the guide.

Occupational health and safety risks (for employees, subcontractors, etc.) are not discussed in this guide[1]. Wherever human health is mentioned in this guide, it is in relation to people outside the organisation's premises.

***What is EMAS?***

EMAS (Eco-Management and Audit Scheme) is a voluntary scheme introduced by a Regulation establishing the EU Standard for establishing and maintaining EMS and public disclosure of the relevant information to the public. EMAS is an instrument of the European Union intended for companies and other organisations that voluntarily undertake to assess their impact on the environment and improve their environmentally friendly activities. Initially it was published in 1993 (EMAS I) and came into force in 1995. The regulation was revised in 2001 and in 2009 the current version of EMAS was published[2].

The scheme is available for voluntary use to all kinds of public or private organisations active in any kind of business or public service, established in any legal form, located inside or outside EU territory. The fundamental requirement for an organisation to use EMAS is that it has its own functions and administration.

[1] Issues related to the management of occupational safety are dealt with, among others, standard ISO 45001: 2018-06 Occupational health and safety management systems - Requirements and guidelines for use.

[2] Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC.

Organisations wishing to be registered in EMAS for the first time shall:

1. carry out an environmental review of all environmental aspects of the organisation,
2. in light of the results of the environmental review, develop and implement an environmental management system,
3. carry out an internal audit,
4. prepare an environmental statement.

As stated above, EMAS was established as a voluntary scheme for organisations, however, as time passed, it became a best practice model also used in mandatory schemes in the EU. A good example is the Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) – often abbreviated as IED. One of the essential requirements for operators carrying out activities listed in Annex I to IED (mostly industrial) is that they need to apply best available techniques (BAT) described at a general level in the IED and in detail in sectoral BAT Conclusions. Most of the BAT conclusions have referred to environmental management system (EMS) since 2011, but the 2024 amendment of the IED[3] introduced the explicit requirement of implementing an EMS and publishing information generated within the EMS, similar to that required in EMAS.

***What is chemicals management in the context of environmental management?***

Proper chemicals management within organisations requires the involvement of various staff with different functions working at varying levels within organisations – not only those typically dealing with environmental protection. Chemicals management may cover the whole life cycle of chemicals in an organisation, thus encompassing e.g. design, procurement, transportation and delivery, packaging, storage, handling and disposal. Therefore, chemicals management requires a systemic approach.

A comprehensive chemicals risk management system goes further still. In addition to the aforementioned, it includes occupational safety and health issues, as well as the safety of products for consumers and the environment, as well as the disposal of products containing chemicals. In this context, the descriptions of chemicals management in this Guide are limited to the scope of environmental management systems.

Chemicals management is about identification and assessment of hazardous chemicals used in organisations and their products, as well as decision-making and implementation of actions to ensure they are used safely throughout their life cycle and to prevent any potentially negative effects from these hazards. It includes:

1. identification of all chemicals used,
2. collecting information about related hazards, amounts, processes and products in which chemicals are used,
3. identification of legal requirements applicable to the chemicals used,
4. identification of activities aimed at preventing potential non-compliance with these requirements,
5. establishing necessary operational routines and criteria, taking into account:

[3] Some of the requirements related to the EMS requirements of the IED directly address chemicals. These requirements will be mentioned in the later section of this guide.

   a. hazards assessment,
   b. exposure assessment (where it is useful for decision-making),
6. setting objectives and implementation of necessary improvements,
7. monitoring and checking whether implemented measures have minimised or eliminated hazards,
8. implementation of additional activities (if needed).

This coincides with the approach used in EMAS based on the continual improvement cycle called PDCA cycle[4], which involves https://translate.googleusercontent.com/translate_f:

1. planning activities aimed at a specific effect,
2. implementation of the adopted plan,
3. checking whether implementation took place as planned,
4. elimination of deficiencies (and in principle the reasons for their occurrence) identified during the checking phase.

Chemicals management will be most effective and efficient if it is integrated into organisation's overall management system, because it enables comprehensive problem solving related to the use of hazardous chemicals.

***For whom is this Guide intended?***

In terms of the target sectors, the principles described in this Guide are applicable to any organisation that uses chemicals in its activities, including:

1. industrial users, i.e. entities using chemicals as auxiliaries (e.g. users of coolants, cleaning agents, reagents) or to produce a mixture (formulators) or other products (articles) in which the chemicals are incorporated,
2. non-industrial users, i.e. those using chemicals in professional activities other than industrial processes, e.g. craftsmen, professional service providers, as well as public administrations.

Substance manufacturers are not the primary target group of this Guide, as their responsibilities in relation to chemical safety include additional tasks and responsibilities. For the purposes of this Guide, it is assumed that the manufactures of substances already have effective tools and procedures in place for chemicals management. They may nevertheless use this Guide for inspiration.

[4] plan - do - check - act

In terms of management approach, the Guide has been prepared for people working for organisations that:

1. maintain an EMS based on the EMAS[5] or are considering EMAS Registration, but so far have had little coverage of chemicals management,

   as well as those that:

2. see no need to maintain a formal EMS but are seeking inspiration for better chemicals management.

The Guide may also be used by environmental verifiers seeking knowledge of good practices applied in various areas related to environmental management.

[5] Organisations using other relevant standards, e.g. ISO 14001 may also find using this Guide valuable.

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# VOCABULARY

## A. Terms

**Organisation** - according to the EMAS Regulation 'a company, corporation, firm, enterprise, authority or institution, located inside or outside the Community, or part or combination thereof, whether incorporated or not, public or private, which has its own functions and administration'.

In more colloquial terms, the term 'organisation' shall be understood as the entity that maintains the EMS. In practice, there are no restrictions on the form of business. It can be a self-employed person running a business, a commercial law company, an administrative body, a non-governmental organisation, regardless of its legal standing. The key to recognising an entity as an organisation lies in its ability to take independent decisions enabling effective environmental management.

**Substance** - a chemical element and its compounds in the natural state or obtained by any manufacturing process, including any additive necessary to preserve its stability and any impurity derived from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition.[6]

**Mixture** - a mixture or solution composed of two or more substances.[2]

**Chemicals** – chemical substances and their mixtures.

**Hazardous chemicals** - chemicals that are a source of risk to the environment, humans and organisations themselves. Although the users of this Guide may use the freedom to determine which chemicals pose a risk, typically the criteria given in the CLP Regulation apply.[7]

**Chemicals management** - all activities of organisational and technical nature, run by individuals, companies, and other organisations to assess, control or eliminate risks to the environment and human health related to the manufacturing, use and disposal of hazardous chemicals including the disposal of products containing these chemicals.

**Dangerous goods** – those substances, mixtures and products/articles of which the carriage is prohibited by ADR/RID, or authorised only under the conditions prescribed therein.[8]

[6] In accordance with the REACH Regulation.
[7] Article 3 states: "A substance or a mixture fulfilling the criteria relating to physical hazards, health hazards or environmental hazards, laid down in Parts 2 to 5 of Annex I is hazardous and shall be classified in relation to the respective hazard classes [...]".
[8] In accordance with the ADR Agreement and RID Regulation.

## B. Abbreviations

**ECHA** – the European Chemicals Agency

**SDS -** safety data sheet - a document containing a description of the risks for a specific chemical substance or mixture, as well as basic data on it, drawn up in accordance with Annex II of the REACH Regulation.

**SDR** - **Sectoral reference documents on Best Environmental Management Practice –** documents published by the European Commission according to the Art. 46 of the EMAS Regulation (see the EC website: https://green-forum.ec.europa.eu/green-business/emas/emas-resources/emas-reference-documents/emas-sectoral-reference-documents_en).

**SVHC –** substances of very high concern. In other words, substances that have properties that can cause irreversible and severe damage to the environment or human health. SVHC are included in the so-called "Candidate list for authorisation", which is published on ECHA's website and updated twice per year. Substances with the following hazard properties may be identified as SVHC:

1. substances meeting the criteria for classification as carcinogenic, mutagenic or toxic for reproduction (CMR) category 1A or 1B in accordance with the CLP Regulation,
2. substances which are persistent, bioaccumulative and toxic (PBT) or very persistent and very bioaccumulative (vPvB) according to REACH Regulation Annex XIII,
3. substances on a case-by-case basis that cause an equivalent level of concern as CMR or PBT/vPvB substances.

**EMS -** Environmental management system – according to the definition in the EMAS Regulation: 'EMS is a part of the organisation's overall management system that includes the organisational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy and managing the environmental aspects'.

In more colloquial terms, the term 'environmental management system' should be understood as all organisational and technical activities carried out by organisations in order to identify opportunities to reduce negative environmental impacts, while maintaining the potential to achieve the organisation's objectives. In this Guide, when discussing EMS, it is understood that the system is based on the requirements of Annex II to the EMAS Regulation.

**EMAS (EMAS Regulation)** - Regulation (EC) No 1221/2009 of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC. The current version of the regulation is sometimes referred to as EMAS III. The previous versions were:

1. EMAS I published in 1993 (1836/93/ EC) and came into force in 1995.
2. EMAS II published in 2001 (761/2001/EC).

**IED** – Directive (EU) 2024/1785 of the European Parliament and of the Council of 24 April 2024 amending Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control) and Council Directive 1999/31/EC on the landfill of waste.

**REACH Regulation** - 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.

**CLP (CLP Regulation)** - Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006.

**ADR** - Agreement concerning the international carriage of dangerous goods by road (ADR) established in Geneva on 30 September 1957.

**RID (RID Regulation)** - Regulation for the International Carriage of Dangerous Goods by Rail, Annex C to the Convention Concerning International Carriage by Rail (COTIF) established in Bern on 9 May 1980.

**SEVESO Directive** - Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.

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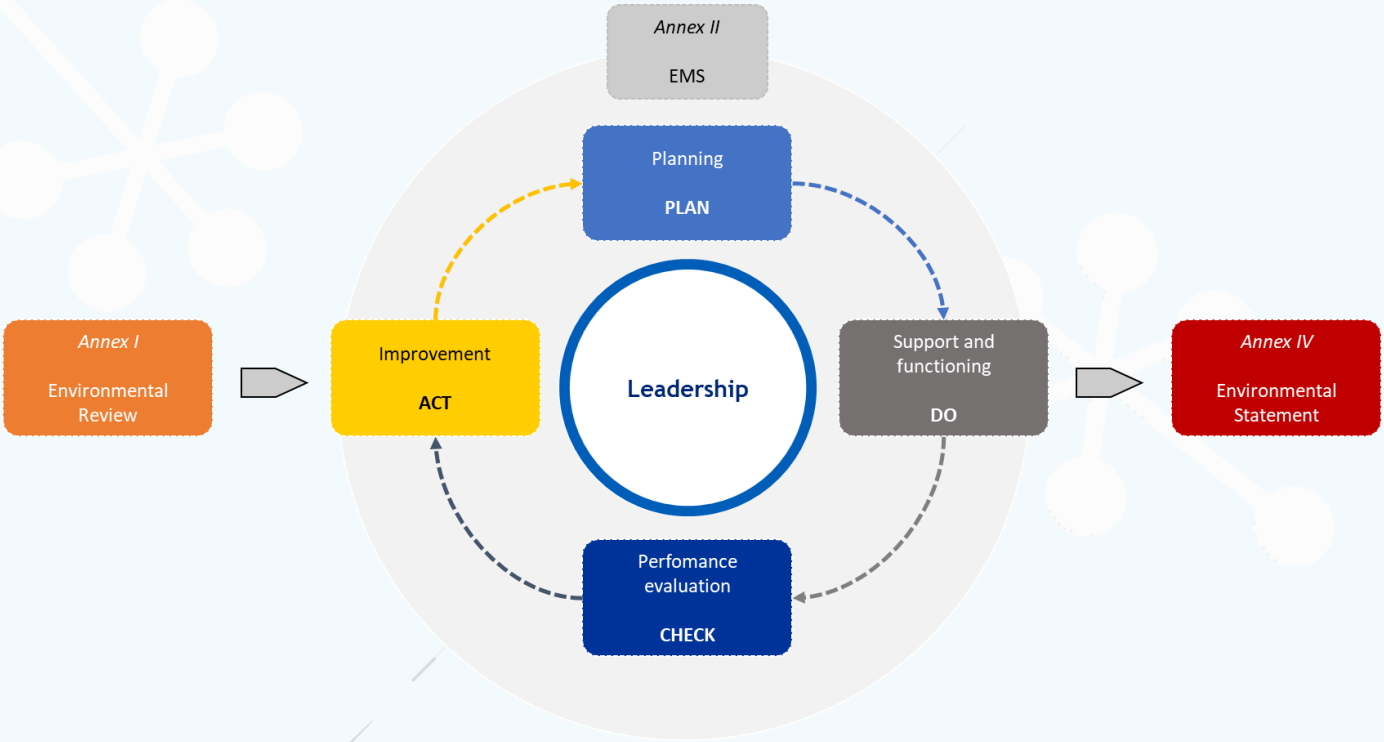
# GUIDANCE ON INCORPORATING CHEMICALS MANAGEMENT INTO EMS – AN OVERVIEW OF THE APPLICABILITY OF EMAS REQUIREMENTS

In this chapter, all the requirements of the EMAS Regulation are discussed in the order that they are listed in the regulation's Annexes I, II and IV and referring to other EMAS requirements where appropriate. For each of the requirements, the elements related to the chemicals management are addressed in more details.




The colours used in the figure above were also used on the following pages to indicate the corresponding parts of the Guide.

It should be noted that the focal point of the EMS described in the Annex II to EMAS is the risk and opportunities concept. Organisations are given a significant freedom to determine those risks and opportunities related to environment. Therefore, if any of the determined risks or opportunities are related to hazardous chemicals, EMS should address them automatically.

## Environmental Review (Annex I)

EMAS draws special attention to determining risks and opportunities and their sources in the environmental review process. Annex I explicitly describes the fundamental elements to be identified in this process and

updated later to ensure a logical framework and strong foundations for the EMS. The environmental review shall cover the following areas:

1. Determination of the organisational context (see Annex II; A.4.1),
2. Identification of the interested parties and determination of their relevant needs and expectations (see Annex II; A.4.2),
3. Identification of the applicable legal requirements relating to the environment (see Annex II; A.6.1.3),
4. Identification of direct and indirect environmental aspects and determination of those being significant (see Annex II; A.6.1.2),
5. Assessment of the significance of the environmental aspects (see Annex II; A.6.1.2),
6. Evaluation of feedback from the investigation of previous incidents (see Annex II; A.6.1.2),
7. Determination and documentation of risk and opportunities (based on the analysis of points 1-4 (see Annex II; A.6.1.),
8. Examination of existing processes, practices and procedures.

As shown above, most of the elements of an environmental review are also addressed in Annex II of EMAS and in the further sections of this Guide respectively. Before getting there, it may be important to address the latter, i.e. examination of existing processes, practices and procedures.

EMAS does not explicitly determine the way environmental aspects and management practices applied are to be identified by an organisation. Regarding chemicals management, the environmental review can be initiated by answering the following questions:

1. What chemicals are purchased, stored and used? Does the organisation maintain an inventory of the chemicals?
2. What is the process for ordering/purchasing chemicals? Are there procedures/instructions and/or purchasing criteria for this process? Do all the chemicals follow the same ordering/purchasing procedure? Are there any ad hoc purchases of chemicals that are carried out outside the approved supplier network?
3. In what quantities are chemicals stored and used at the installation? Are the quantities of chemicals known at all times by the organisation?
4. How are chemicals stored? Does the organisation have, and apply, an established procedure for storing chemicals?
5. How are chemicals labelled?
6. Does the organisation have valid safety data sheets for chemicals that are present on-site and classified as hazardous?
7. Have the flow patterns for chemicals in the production, or any secondary processes, been determined? Have mass balances of chemicals, including process inputs and outputs, been developed? Have any attempts been made to determine the actual consumption levels of various chemicals per unit of production, or service provided?
8. What are the ways of using and applying the chemicals? Have the modes of their use in individual operations been established? Have quantitative or qualitative criteria, related to their application, been established?
9. Does the organisation oversee subcontractors, operating within the organisation, supervising the type and amount of chemicals they use, and how they are used? Does the organisation conduct such supervision of subcontractors operating outside the organisation's premises?

10. During the product or process design stage, does the organisation analyse the consequences resulting from the use of chemicals?
11. Does the organisation have chemicals-related goals in the environmental policy?
12. Is a register of applicable legislation existing that specifies the chemicals-related requirements?
13. Do emissions of hazardous chemicals from the processes occur?
14. How are hazardous chemical wastes treated in the organisation?

The level of detail within the information collected about chemicals should be adjusted to the needs of the decision-makers. A lot of information can be collected with reasonably simple methods such as by walking through places where chemicals may be present. It is worth remembering that the walk-through should observe, among others, the following:

1. places, where chemicals are delivered,
2. places for temporary and long-term storage of chemicals,
3. auxiliary processes,
4. main processes and products,
5. places for waste collection and storage.

Collecting answers to the aforementioned questions may be useful for both organisations seeking to integrate management of chemicals into an environmental management system from scratch, as well as those that have already done so, but want to check if their EMS takes chemicals into consideration to a sufficient extent.

Both at the initial review stage, and when integrating chemicals management into the overall EMS system, it is worthwhile establishing answers to additional fundamental questions with a particular view to chemicals:

1. What is the organisation’s primary purpose?
2. What are the intended outcomes from implementing and maintaining the EMS?

Answering the first question will facilitate the identification of risks and opportunities for the purpose of the organisation's existence and answering the latter will facilitate the assessment of the effectiveness of the EMS. It is worth noting that according to EMAS, these intended outcomes should at least include the following:

1. improvement of the environmental effects of operations, i.e. minimisation of adverse impacts from chemicals use or enhancing positive ones,
2. compliance with compliance obligations, regarding the use of chemicals in installations and products as well as related communication,
3. achieving environmental objectives, i.e. minimisation of adverse impacts from the use of chemicals or enhancing positive ones.

The use of hazardous chemicals may certainly be a source of threats for the organisation and substituting them may result in opportunities for the organisation.

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## Context of the organisation (Annex II, A.4)

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| UNDERSTANDING THE ORGANISATION AND ITS CONTEXT (A.4.1) | EMAS requires organisations to determine the context in which they operate. In doing so, organisations shall consider internal and external issues influencing the purpose of their existence and in particular the intended outcomes of implementing and maintaining an EMS.<br><br>Understanding the context is the basis for determining the risks and opportunities for the organisation and for their further inclusion in the EMS. Determining the context in which the organisation functions is part of the environmental review. |

The purpose of this requirement of the standard is to make decision-makers in the organisation aware of the circumstances that the organisation operates in to avoid mistakes that could result in unforeseen costs, the loss of the organisation's good image or a decrease in sales.

Determining external and internal issues does not necessarily imply a direct obligation to document this process and its results. However, changes in the context need to be reflected in the documented information related to the management review (see Sub-clause A.9.3).

In relation to chemicals management, external issues may include the following:

1. developments in governmental policies, including upcoming legislation and standards,
2. market pressure and public awareness in relation to activities and products involving hazardous chemicals, including pressure to phase out hazardous chemicals and related impacts on sales and revenues,
3. resource scarcity, including availability of substitutes and price volatility - impact on the supply chain, production, sales, and revenues,
4. the emergence of new technologies,
5. competition - introducing new solutions by competing organisations.

Some of the external issues are related to the needs and expectations of external stakeholders, which will be presented in the following section.

Information about changes of the regulatory status of substances can be found in:

- the register of SVHC intentions, which lists substances for which an identification as substance of very high concern (SVHC) is planned in the near future (see the ECHA website - https://echa.europa.eu/en/registry-of-svhc-intentions/).
- the register of intentions to change the classification and labelling - the register contains proposals for new or revised harmonised classification and labelling of substances (see the ECHA website - https://echa.europa.eu/en/registry-of-clh-intentions-until-outcome/)

- the list of substances proposed as POPs[9] https://translate.googleusercontent.com/translate_f- which lists and provides information about all chemicals proposed for the potential inclusion in the Stockholm Convention (see the ECHA website - https://echa.europa.eu/pl/list-of-substances-proposed-as-pops),

Internal issues may include:

1. conditions related to technologies used, including related limitations, e.g. no possibility to change the chemicals used without significant changes in the equipment,
2. local conditions (including limitations) related to the characteristics of the buildings and location (e.g. no possibility of installation of larger tanks),
3. level of involvement in various tasks related to the use of chemicals between various departments of the organisation (e.g. purchasing department, legal department, health and safety department, etc.),
4. awareness and skill sets of the staff handling chemicals.

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| UNDERSTANDING THE NEEDS AND EXPECTATIONS OF INTERESTED PARTIES (A.4.2) | Some of the external and internal factors referred to in Sub-clause A.4.1 of the Annex II to EMAS are explicitly expressed by external and internal interested parties (often called stakeholders), i.e. entities perceiving themselves as being influenced by the organisation's decisions or actions in the field related to the environment. EMAS requires organisations to identify these stakeholders, understand their needs and expectations, and then decide which of these needs and expectations to implement.<br><br>Stakeholders' articulation of their needs and expectations does not automatically imply that the organisation that maintains the EMS is committed to meeting them. Determining the relevant needs and expectations of interested parties is part of the environmental review. |

The purpose of this requirement is to ensure that the expectations and needs of stakeholders do not escape the organisation’s attention. The organisation should intentionally decide which expectations and needs it will take into account.

In relation to the chemicals management, examples of stakeholders along with their potential needs and expectations may include:

1. consumers interested in the impact of products and services on their health and the environment,
2. customers interested in the impact of products and services on their health and the environment, demand to eliminate hazardous chemicals from the supply chain, inquiries about the content of hazardous chemicals in products, including certification of product composition,

[9] POPs - persistent or organic pollutants are organic substances that remain permanently in the environment, accumulate in living organisms, and pose a threat to human health and the environment. They can be transported via air, water or migratory species across national borders, reaching regions where they have never been produced or used. POPs are regulated by the Stockholm Convention and Regulation (EU) 2019/1021 of the European Parliament and of the Council of June 20, 2019 on persistent organic pollutants.

3. neighbours interested in the hazardous chemicals used and the actual or their potential release into the air, water, or soil in normal conditions, as well as in an emergency,
4. local authorities requesting a submission of information about the use of hazardous chemicals and to inform them about the cases which have infiltrated the air, water, or soil,
5. industry organisations interested in the hazardous chemicals used, the processes in which they are used, the solutions used in chemicals management and the risks associated with their use,
6. related entities - e.g. within ownership structures (e.g. owners or shareholders) - interested in maintaining a positive image of the entire organisation.

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| DETERMINING THE SCOPE OF THE ENVIRONMENTAL MANAGEMENT SYSTEM (A.4.3) | EMAS requires organisations to define the physical and functional boundaries within which its EMS operates.<br><br>When deciding upon the scope of an EMS, several factors should be considered, such as:<br>• the context of the organisation, the expectations and needs of the interested parties (see Sub-clauses A.4.1 and A.4.2),<br>• the organisational structure and geographic locations in which the organisation operates,<br>• the ability to control and influence elements of the supply chain throughout the life cycle of products or services. |

The purpose of this requirement is to ensure the credibility of the EMS. In most cases, the most obvious solution is to cover all the organisation's activities, although in some cases this may turn out to be impossible or unjustified.

The scope of EMS needs to be documented and available to interested parties.

From the perspective of chemicals management, the scope of EMS can cover the organisation’s main processes e.g. production, design, and logistics supervision of subcontractors and even waste generated in connection with the operation and end of life of the product. It should be emphasised that outsourced functions or processes typically fall within the scope of the system, although the external organisations providing them are generally not covered by it. This is especially true for chemicals management, which often requires influencing suppliers and considering long-term impacts on consumers and environment. In many cases, although it may not be possible to influence the conduct of suppliers, it may be possible to change the supplier. Contractors can be selected based on their chemical performance. It is essential to include the relevant products within the scope of EMS, because the impact on the consumers and the environment from hazardous chemicals is in most cases related to the products rather than to the emissions from the installation that produces them.

The credibility of an EMS may be limited if an organisation excludes some environmentally relevant parts of its activities or products from the scope of the EMS. Any exclusions from the scope of the EMS shall be transparently documented and communicated to stakeholders.

Issues to consider (examples):

1. whether all significant issues related to chemicals management or all areas of activity where chemicals are used, are included in the scope of the EMS,
2. whether it is appropriate to extend the scope of the EMS to other areas of the organisation's activities (e.g. organisational units or geographic locations), which would allow for better supervision of the quantities and types of chemicals:
    a. used within the organisation's processes,
    b. used in the processes of other entities, which the organisation may supervise or influence to any degree, e.g. through cooperation in the supply chain, including communication with suppliers and customers.

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| ENVIRONMENTAL MANAGEMENT SYSTEM (A.4.4) | Using information generated while implementing the requirements addressed above, EMAS requires organisations to establish, maintain and continually improve its environmental management system to achieve the intended outcomes under the EMS, including enhancing its environmental performance. |

The purpose of this requirement is to ensure that the environmental management system is actually used to improve the overall performance of the business, minimising risks and seeking opportunities.

Issues to consider:

1. how should the organisation incorporate EMS (including chemicals management) into its business processes, e.g. in designing, planning and executing purchases, human resource management, sales, promotion, and marketing etc.,
2. is continual improvement of chemicals management feasible to the organisation.

A good example of what the EMS could address in terms of chemicals are the requirements of IED and selected BAT Conclusions regarding chemicals. Article 14a of IED as a minimum requires organisations to:

1. maintain a chemicals inventory of the hazardous chemicals present in or emitted from the installation,
2. carry out a risk assessment of the impact of such substances on human health and the environment,
3. conduct analysis of the possibilities for substituting them with safer alternatives or reducing their use or emissions.

In this respect, the IED requirements could be used as a guideline for any organisation willing to identify improvement options and set up chemicals-related environmental objectives.

In some of the sectors covered by BAT Conclusions, the requirements go further. The most comprehensive description can be found in the BAT Conclusions for the textile industry[10], which states that BAT is to elaborate and implement an environmental management system (EMS) that incorporates a chemicals management system (CMS) covering specific elements (for more details see Appendix 10).

[10] Commission Implementing Decision (EU) 2022/2508 of 9 December 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the textiles industry.

BAT Conclusions for some other sectors (i.e. Ferrous Metals Processing Industry and Slaughterhouses, Animal By-products and/or Edible Co-products Industries), as well as cross sectoral ones (Common Waste Gas Management and Treatment Systems in the Chemical Sector) also directly address chemicals management system. One should note, however, that BAT Conclusions are legally binding for the organisations carrying out the relevant categories of activities.

## Leadership (A.5)

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| LEADERSHIP AND COMMITMENT (A.5.1) | EMAS requires the top management of organisations to accept responsibility for the effectiveness of the EMS and demonstrate leadership and commitment to its operation.<br><br>The attitude of management shall include the provision of resources, communicating the importance of an effective EMS for the organisation and achieving its strategic objectives.<br><br>Although top management may delegate some of its responsibilities to others, it shall nevertheless assume both responsibility and accountability for the outcome of the actions taken. |

The purpose of this requirement is to ensure the effectiveness of the EMS. Practical experiences show that EMS effectiveness depends to a large extent on the commitment of management, including top management. The level of commitment of top management to exercise leadership translates into the involvement of other employees within the organisation. This applies to all areas of the organisation, including chemicals management.

Examples of top management involvement in chemicals management issues include:

1. conducting or initiating activities related to the identification of risks for the organisation resulting from the use of hazardous chemicals in both the organisation's and contractor's activities,
2. including issues related to the chemicals management in the organisation's strategies,
3. internal and external communication regarding the importance of the management of hazardous chemicals, with the objective of maintaining or improving the organisation's market position,
4. providing resources for effective chemicals management,
5. encouraging and motivating employees to seek and implement good practices in the field of management of hazardous chemicals,
6. initiating cooperation in the supply chain aimed at reducing the negative effects of the use of chemicals,
7. considering joining voluntary initiatives on chemicals management e.g. the Responsible Care programme (for the chemical industry).

Top management may partly or wholly delegate these issues to other employees. However, it may be useful, in larger organisations in particular, to appoint a person responsible for the management of chemicals. It should

be noted, however, that even if these tasks are delegated, top management remains accountable for their implementation.

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| ENVIRONMENTAL POLICY (A.5.2)<br><br>AND<br><br>CONTINUAL IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE (B.1) | The environmental policy is a document in which the top management of the organisation defines the direction of its activities aimed at limiting the negative impact on the environment.<br><br>EMAS requires the environmental policy to include at least the following obligations:<br>• continual improvement of the environmental management system in order to reduce the negative or strengthen the positive environmental impacts of the organisation (i.e. continual improvement of environmental performance),<br>• meeting external requirements resulting from legal regulations or other sources (including those resulting from certain expectations of interested parties),<br>• environmental protection, including pollution prevention,<br>• other activities resulting from the operating context of the organisation. |

The purpose of this requirement is to ensure that the organisation's top management communicates its approach and aspirations with regard to the environment to stakeholders. For internal stakeholders (e.g. employees), the policy should indicate how to deal with cases where more detailed regulations are not available. In relation to external stakeholders, the environmental policy is a declaration of will and specific obligations in the field of environmental protection.

The policy shall be documented and available to stakeholders, e.g. on the organisation’s website.

Continual improvement of environmental performance does not mean that all negative impacts need to be reduced or that all positive environmental impacts need to be strengthened at the same time. One should note, however, that in the event that an organisation operates more than one site, there must be some improvement in each of them.

Addressing the chemicals management more specifically, the main and overarching goal to be included in the environmental policy should be the minimisation or at least continual reduction of negative environmental impacts related to chemicals. This can be achieved by:

1. minimising the use of hazardous chemicals (e.g. SVHC) in own processes,
2. limiting or eliminating the content of hazardous chemicals in products,
3. substituting or eliminating hazardous chemicals in products and services offered by the organisation,
4. ensuring that, in cases where the use of hazardous chemicals cannot be avoided, their inclusion in products does not hinder recycling, i.e. that they are recognisable and separable from the product during waste processing,
5. increasing transparency on the use of chemicals in products, production and auxiliary processes.

Concluding this section, it is worth mentioning that IED includes a requirement that an organisation's environmental policy "shall include measures to: […] prevent or reduce the use or emissions of hazardous substances".

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| ORGANISATIONAL ROLES, RESPONSIBILITIES, AND AUTHORITIES (A.5.3)<br><br>AND<br><br>MANAGEMENT REPRESENTATIVE(S) (B.2.) | EMAS requires the organisation's top management to assign roles, responsibilities and authorities related to the environment to the appropriate persons. This shall apply to various levels within the organisational structure ranging from top management to operational positions.<br><br>Top management, when assigning roles, responsibilities and authorities to the organisation should anticipate the need to ensure compliance with the requirements of the standard and to communicate the organisation's environmental management performance.<br><br>EMAS specifically requires the organisation's top management to appoint its representative (or representatives) who reports to top management on the performance of the environmental management system.<br><br>A relatively often used solution is the establishment of the so-called management representative for the organisation's EMS. |

The purpose of this requirement is to ensure that the organisational structure is adapted to the needs resulting from the organisation's environmental policy and other internal and external environmental regulations.

With regard to the chemicals management, it is important that the responsibility for chemicals is either explicitly mentioned in the job description of the dedicated person (e.g. environmental or occupational health and safety manager) or, in specific cases, defined as a self-standing responsibility within the organisation. It is essential that anyone with tasks related to chemicals, including e.g. designers or purchasers, know and understand their responsibilities to either address the topic in their routines, or contact and involve the relevant person. They shall also be aware of the risks associated with the use of specific chemicals (see Sub-clauses A.7.2 and A.7.3).

In some countries, particular tasks related to chemicals management may have to be performed by specialists (with a particular qualification and/or certification need). Examples include advisors for the transportation of dangerous goods by road or rail[11], or specialists with knowledge of how to compile safety data sheets.

[11] The obligation to employ an advisor for the transportation of dangerous goods is derived from the ADR Agreement in the case of road transport of dangerous goods and the RID Regulations in the case of rail transport.

Issues to consider (examples):

1. assigning responsibility for chemicals management to a specific person. In most cases, this would be an additional competence area for the existing managerial position (e.g. environmental or occupational health and safety manager),
2. creating a list of people involved in the proper chemicals management in all areas of the organisation's operation (design, procurement, technological processes, maintenance, storage, transportation, etc.),
3. assigning these people additional duties, responsibilities and authorities, e.g. the organisation may assign additional responsibilities and authorities in the area of procurement of hazardous chemicals to one of the people working in the procurement department. Sufficient time resources should be designated (in the job descriptions) to the responsible staff to ensure they can fulfil their duties.

## Planning (A.6)

NOTE: In EMAS, planning is based on the risk determination. The standard defines the term 'risk' and the phrase 'risks and opportunities' separately. 'Risk' means 'effect of uncertainty' with the term 'effect' explained further as 'a deviation from the expected — positive or negative'. The phrase 'risks and opportunities' is expanded to 'potential adverse effects (threats) and potential beneficial effects (opportunities)'. In order to avoid misunderstandings with the term 'risk' as defined in chemicals legislation and chemicals management, in this Guide (except where this is due to the fact that part of the standard is quoted), the phrase 'threats and opportunities' or the terms 'threats' and 'opportunities' are used instead of 'risks and opportunities'. It should to be stressed that the term 'risks and opportunities' in the EMAS is related to the effect on both organisations and the environment (double materiality).

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| ACTIONS TO ADDRESS RISKS AND OPPORTUNITIES - GENERAL (A.6.1.1)<br><br>AND<br><br>ENVIRONMENTAL REVIEW (B.3) | EMAS requires organisations to identify risks and opportunities that may positively or negatively impact the environment or organisation[12] in terms of:<br>• intended outcomes of implementing and maintaining an EMS,<br>• the purpose the organisation has been established for,<br>• continual improvement of the EMS, including enhancement of environmental performance.<br><br>The determination of risks and opportunities is essential to planning environmental activities. It is a part of the environmental review. |

The purpose of this requirement is to ensure that the EMS addresses the real problems of the organisation, i.e. those that may have an impact (positive or negative) on the purpose for which it has been established.

The sources of risks and opportunities may include:

1. identified environmental aspects (e.g. potential emergency situations related to the use of hazardous chemicals) - see Sub-clause A.6.1.2,
2. legal requirements - see Sub-clause A.6.1.3,

[12] The concept of risks and opportunities possibly implementing environment or organisation is close to double materiality perspective used in the EU DIRECTIVE 2022/2464 regarding corporate sustainability reporting (CSRD).

3. expectations of stakeholders (including customers, product users, and service users of the organisation) - see Sub-clause A.4.2,
   which all need to be determined in the initial environmental review and updated on a continual basis.

It is worth reiterating that the term 'risks and opportunities' is related both to the organisation as such and to the environment.

Addressing chemicals management more specifically, one should note that any failure in storage, handling or use of hazardous chemicals may cause an adverse impact on the environment. This may contribute to possible claims or legal sanctions against the organisation, which are to be considered a threat. The growing environmental awareness of customers and the related increase in demand for the products or services which, to a lesser extent, negatively affect the environment can be considered to be an opportunity for organisations that are able to satisfy this demand.

With regard to chemicals management in organisations, threats can include, but are not limited to:

1. decline in sales resulting from customer concerns related to the use of hazardous chemicals or their presence in the products,
2. a legal ban or use restrictions on certain hazardous chemicals and the related difficulties and costs of substitution or other compliance assurance measures,
3. the possible costs of compensations related to the adverse effects of certain hazardous chemicals on people living in the vicinity, the users of the products (consumers) or the environment[13] – in normal conditions or in an emergency situation,
4. deterioration of the image of the organisation and its products as a result, for example, of unwanted substances in product or chemical accidents,
5. loss of clients as a result of disseminating information about the negative impact of hazardous chemicals used in production by the organisation.

In turn, opportunities for the organisation may include:

1. reduction of direct costs due to the introduction of technical and organisational solutions for a better chemicals management (reduction of consumption, replacement of chemicals that are cheaper to purchase or use),
2. reduction of indirect costs (e.g. compensation) in connection with the improvement of the chemicals management,
3. gaining a competitive advantage in the event of changes in legal requirements,
4. gaining a competitive advantage whilst changing customer awareness,
5. an improved image, as a result of introducing products to the market that contain less hazardous chemicals.

The IED requires that any company with an EMS shall:

1. maintain a chemicals inventory,

[13] See Directive 2004/35 / EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of damage caused to the environment.

2. carry out a risk assessment regarding impacts from the use of these substances on human health and the environment
3. assess options to either substitute them or reduce their use/emissions[14].

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| ENVIRONMENTAL ASPECTS (A.6.1.2) | An environmental aspect according to EMAS is '*an element of an organisation's activities, products or services that has or can have an impact on the environment'.*<br><br>EMAS requires organisations to:<br>• identify the environmental aspects of their activities, products, and services that they can control or influence,<br>• determine environmental impacts related to the environmental aspects,<br>• establish criteria for significance evaluation of environmental aspects,<br>• indicate those environmental aspects that are considered significant, i.e. evaluate aspects according to the adopted criteria.<br><br>When determining environmental aspects and related environmental impacts, the organisation shall consider:<br>• planned projects and anticipated changes in their activities, products, and services,<br>• expected unusual conditions, including emergency situations,<br>• life cycle perspective, i.e. environmental impacts related to sourcing of raw materials, production of parts/elements by suppliers, delivery, transportation, distribution of products, use of products, processing of products after their end of life, and disposal of related waste.<br><br>According to EMAS:<br>• a significant environmental aspect is one that has or can have a significant environmental impact,<br>• significant environmental aspects are determined by organisations using one or more criteria.<br><br>Determining environmental aspects and indicating those which are significant is part of the environmental review. |

The purpose of identifying and evaluating the environmental aspects is to facilitate the selection of the areas to be addressed by the organisation's EMS. This means that the identification and evaluation of environmental aspects is a supportive process for other elements of the EMS, e.g. determining risks and opportunities (Sub-

[14] See IED art. 14 a, item 2d.

clause A.6.1.1), setting environmental objectives (Sub-clause A.6.2), operational activities (Sub-clause A.8.1), emergency preparedness and response (Sub-clause A.8.2.), and monitoring and measurements (Sub-clause A.9.1.).

The processes of environmental aspects determination and evaluation, including their outcomes, shall be documented.

**Identification of environmental aspects**

For chemicals, there are at least two basic options for identifying environmental aspects:

1. the selection and use of hazardous chemicals - in every phase of the product life cycle,
2. the release of chemicals (or, in fact, their components) into specific elements of the environment (e.g. air, surface water, soil, etc.):
    a. under normal conditions, i.e. during production processes / provision of services,
    b. at every stage of the product life cycle, e.g. during its operation,
    c. in the event of an emergency.

The first option facilitates the management of chemicals on the purchasing, storage, and process side. The second aims to determine significant environmental impacts caused by chemicals after release through usage. The organisation may consider that a combination of the options outlined above is the optimal solution.

In both cases, the identification and evaluation of the environmental aspects related to chemicals require a complete inventory of all purchased chemicals, including their hazardous properties. Furthermore, information about their storage, use, and release to the environment are needed.

NOTE: The level of detail of the chemicals inventory, its relevance and accessibility to those involved in the management of chemicals, is critical to the effectiveness of the management of chemicals. For the purposes of EMAS, the standard content of a chemicals inventory (i.e. name, identifier, purchased amount, hazardous properties, regulatory requirements, products it is included in) should be extended to also contain information about the processes a product is used in, storage amounts, amounts in waste and emitted amounts to facilitate the identification of the presence of chemicals in main and secondary processes, but also those that remain in the product, become waste, or are released into the environment. Some of this information may have to be estimated as emission measurements are not normally available at the level of substances, for example. *More information about the chemicals inventory can be found in Appendix 8.*

**Evaluation of environmental aspects**

The definition of an environmental aspect in EMAS indicates that the basic criterion for evaluating environmental aspects is the scale of the related environmental impact. For chemicals, the toxicological impact[15] (human health and environmental risk in the "language of chemicals") can be evaluated on the basis of:

1. their hazardous properties regarding human health and the environment

and

2. the level of environmental and human exposure to the chemicals.

Some substances do not have a toxicological threshold, i.e. adverse effects can occur upon coming into contact with very low doses. Persistent chemicals accumulate in the environment, and no stable (non-impacting) concentration can be determined. In both cases, the evaluation of impacts should be set to "high priority" and a quantification of impact should be considered as not possible.

Furthermore, the entire life cycle should be considered, i.e. the evaluation should include threats related to:

1. potential adverse impacts on consumer health caused by using the products and services provided by the organisation due to the release of hazardous substances during product usage, as well as from indirect exposure via the environment,
2. potential damage to the environment due to emissions from all life cycle stages, including product usage and disposal of the end-product, and damage from accidents that give rise to uncontrolled releases of chemicals into the environment.

The scale of the problem/environmental aspect is quantified via a chemical risk assessment, requiring information about the hazardous properties of chemicals and the level of exposure of humans and the environment.

Hazards of chemicals can be grouped as follows:

1. physical-chemical hazards, e.g. explosiveness, flammability, metal corrosion ability,
2. human health hazards, e.g. acute toxicity, skin corrosion / irritation, respiratory sensitisation, germ cell mutagenicity, endocrine disruption
3. environmental hazards, e.g. persistence, bioaccumulation potential, mobility or aquatic toxicity, endocrine disruption.

Information about chemical hazards is provided, as a default, in the safety data sheets, which are compulsorily supplied with hazardous (classified) chemicals in all EU member states[16]. Special attention should be paid in regard to chemicals that contain substances that are subject to authorisation, i.e. chemicals which are prohibited unless an authorisation is granted, and restrictions, i.e. chemicals that are prohibited in general or for specific uses.

[15] Environmental impacts, e.g. climate change that may result from the production of a chemical are not discussed here but should be covered under the regular procedures of EMAS implementation.

[16] If a substance or mixture is not hazardous, no safety data sheet has to be provided. In this case, it can be assumed, until new and different information on hazards becomes available, that the ecotoxic, toxic and physical-chemical impacts of these chemicals are negligible.

*More information about such substances is provided in Appendix 1.*

The levels of exposure to a substance are usually modelled in regulatory risk assessments. Based on information about the volumes of usage per life cycle stage, the amounts emitted to the workplace, consumer environment and the natural environment are estimated. Considering the behaviour of chemicals in the workplace, living environment and natural environment, a dose or concentration can be determined by models to which humans and the environment are exposed. Further information can be found in guidance documents for chemical risk assessment (see: https://www.fitreach.eu/content/tools).

The quantity of chemicals stored in a given location, and the way in which they are stored, can be considered as supplementary criteria for environmental aspect evaluation. For some chemicals there are indications of what amount could be considered a 'significant level' with a view to the safety of an installation and the release of toxic chemicals in the event of an accident.

In this case, the source of information can be the lists in Annex 1 to the SEVESO Directive. These lists indicate the threshold quantities of hazardous substances, therefore qualifying a plant to be in a lower or upper tier risk category with regard to:

1. specific categories and hazards posed by substances,
2. specific substances.

The information presented above may serve as an inspiration for the adoption of criteria for the evaluation of the environmental aspects related to chemicals. However, it should be emphasised that the selection of evaluation criteria is an autonomous decision on the part of the organisation.

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| COMPLIANCE OBLIGATIONS (A.6.1.3)<br><br>AND<br><br>LEGAL COMPLIANCE (B.4.) | EMAS requires organisations to determine:<br>• requirements resulting from applicable laws and regulations,<br>• requirements from other sources adopted for use by the organisation for non-legal reasons.<br><br>The organisation shall have access to these requirements, understand their implications, maintain relevant documented information and have procedures in place ensuring ongoing compliance. Determining the applicable legal requirements is part of the environmental review. |

The purpose of this requirement is to ensure that the organisation complies with all applicable requirements, because being aware of requirements is considered to be a prerequisite of compliance.

It should be emphasised that the term 'legal requirement' should by no means be understood to mean 'legal act'. Hence, the register of legal requirements, which is an obligatory element of documented information according to EMAS, does not mean a list of titles of legal acts, but rather specific obligations (including limitations and bans) deriving from these legal acts.

*While Annex I to EMAS explicitly addresses only legal requirements to be determined, one should note that non-legal requirements also need to be addressed along with needs and expectations of interested parties. According to this requirement, an organisation needs to be aware of any changes in legal and other requirements related to the environment. The appropriate process needs to be established, implemented and maintained within EMS.*

The sources of legal requirements can be:

1. international law - ratified international conventions and agreements, including EU treaties,
2. European Union law - regulations, directives, and decisions,
3. national law - legal acts issued by the legislator,
4. local law - legal acts issued by local authorities.

An overview of the European Union's legislation on chemicals can be found in the EU Chemical Law Finder EUCLEF. There are also other independent service providers offering tools for setting up and updating legal requirement registers dedicated to the organisation's specifics.

*More information about EUCLEF ECHA CHEM can be found in Appendix 2.*

Legal requirements addressing chemicals can take the form of:

1. bans on placement on the market, including in cases where the chemical in question is contained in goods,
2. specific usage restrictions, including in cases where the chemical in question is contained in goods,
3. conditions for placement on the market, including in cases where the chemical in question is contained in goods,
4. *classification obligations (i.e. indicating chemical hazards),*
5. communication requirements, such as Safety Data Sheets or information about the content of allergens,
6. reporting obligations,
7. setting up a chemicals management system as an element of BAT.

*Examples of forms of the legal requirements for chemicals are provided in Appendix 3.*

Indirectly, issues related to chemicals management may also be influenced by other legal instruments, e.g. emission standards (emission-limit values), environment quality standards (permissible concentrations of pollutants in a given environmental component), or occupational exposure limit values of chemical agents in the workplace.

*A non-exhaustive list of legal acts which define legal requirements is provided in Appendix 4.*

Compliance obligations other than legal requirements regarding the environment (including the use of hazardous chemicals) may arise, for instance, from:

1. corporate requirements (e.g. an independent decision of the capital group within which the organisation operates),
2. customer requirements,

3. voluntary obligations adopted by the organisation, resulting, for example, from programmes such as: Corporate Social Responsibility (CSR), Responsible Care (RC), eco-labelling (eco-labels).

**Corporate social responsibility (CSR)** is the 'responsibility of an organisation for the impacts of its decisions and activities on society and the environment provided by a transparent and ethical behaviour that:

- contributes to sustainable development, including the welfare and health of society,
- takes into account the expectations of stakeholders,
- complies with applicable law and consistent with international standards of conduct,
- it is integrated with the activities of the organisation and practiced in its relations.'

(source: ISO 26000 Guidance on social responsibility)

**Ecolabelling –** ecolabelling is a voluntary method of environmental performance certification and labelling that is practised around the world. An ecolabel indicates products or services proven to be environmentally preferable within a specific category.

**EU Ecolabel**

The EU Ecolabel is a label that can be applied to the products and services that meet high environmental standards throughout their entire life cycle, from extraction of raw materials to production, distribution, and disposal. Consideration of the entire life cycle in the evaluation of products guarantees the reliability of the evaluation. EU Ecolabel criteria include strict requirements on chemicals. One of the EU Ecolabel criteria is the environmental impact of toxic substances, e.g. no chlorine gas is used as a bleaching agent in EU Ecolabelled graphic and copying paper.

EU ecolabels can now be obtained for 24 groups of products, including paints, varnishes, cleaners, and coolants.

The functioning of the EU Ecolabel is regulated by Regulation (EC) No 66/2010 of the European Parliament and the Council of 25 November 2009 on the EU Ecolabel.

**Responsible Care (RC)** is a pro-environmental programme implemented by the chemical industry worldwide. Companies from the chemical sector, and related industries, participating in the programme voluntarily undertake activities for the purposes of:

- environmental protection,
- health protection,
- increase in process-safety.

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| PLANNING ACTION (A.6.1.4) | EMAS requires organisations to plan actions addressing identified:<br>• significant environmental aspects,<br>• compliance obligations,<br>• threats and opportunities.<br>Planned actions shall be further incorporated into the EMS. |

The purpose of this requirement is to ensure that identification of the most important issues is actually followed up by actions, which are explicitly planned.

Planned actions shall be incorporated into other elements of the EMS described in the further paragraphs:

1. environmental objectives (Sub-clause A.6.2.),
2. supporting elements:
   a. resources (Sub-clause A.7.1.),
   b. competence (Sub-clause A.7.2.),
   c. awareness (Sub-clause A.7.3.),
   d. communication (Sub-clause A.7.4.),
   e. documented information (Sub-clause A.7.5.),
3. operational planning and control (Sub-clause A.8.1.),
4. emergency preparedness and response (Sub-clause A.8.2.),
5. monitoring, measurement, analysis, and evaluation (Sub-clause A.9.1.).

This EMAS sub-clause is the basis for the statement that by:

1. identifying the use of chemicals as a significant environmental aspect(s),
2. taking into account relevant legal, and other, requirements, and
3. determining risks and opportunities related to chemicals

an EMS can provide proper chemicals management.

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| ENVIRONMENTAL OBJECTIVES AND PLANNING TO ACHIEVE THEM (A.6.2.1, A.6.2.2 AND B.5) | EMAS requires organisations to define environmental objectives and plan actions to meet them. Environmental objectives shall lead to the improvements in their environmental performance, i.e. reduce the negative impact on the environment or enhance the positive impact.<br><br>Environmental objectives shall result from the adopted environmental policy and should be formulated in a way that makes it possible to clearly determine the degree to which they have been implemented.<br><br>EMAS requires that the degree of achieving environmental objectives is monitored, updated, and communicated.<br><br>The standard requires organisations to consider: |

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| | • environmental aspects they consider to be significant,<br>• legal and other environmental requirements (including the needs and expectations of stakeholders),<br>• identified risks (threats and opportunities). |

Determining environmental objectives is in fact implementation of a policy commitment to continual improvement, including enhancement of environmental performance. Establishing a plan to achieve them is necessary to ensure the provision of resources for an EMS (see Sub-clause A.7.1.).

Environmental objectives shall be documented.

In relation to the management of chemicals, the organisation should, taking the identified threats and opportunities into account, decide which chemicals-related environmental objectives should be adopted. When setting environmental objectives for chemicals, a hierarchy of measures can be used:

1. elimination of the use of hazardous substances, including by functional substitution with less hazardous alternatives (including technical and organisational solutions),
2. reducing the use of hazardous chemicals,
3. where the use of hazardous substances cannot be avoided, by reducing the exposure levels in the environment and for consumers through technical and organisational measures including the provision of information about the safe use of the product.

*Examples of environmental objectives for chemicals, together with a description of the situation that necessitates their adoption, are provided in Appendix 5.*

## Support (A.7)

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| RESOURCES (A.7.1) | EMAS requires organisations to provide resources necessary for the functioning of the environmental management system. These resources shall not only be limited to financial resources, but also include:<br>• people - employees responsible for the functioning of the EMS,<br>• time, and<br>• access to technology. |

The purpose of this requirement is to transfer the commitment of the organisation's top management to provide resources to the functioning of the EMS (see Sub-clause A.5.1.) to an operational level.

In terms of chemicals management, the provision of resources does not differ from other areas within an EMS. Examples of necessary resources include:

1. the time necessary to obtain information about chemicals, or technical solutions available on the market, the implementation of which could contribute to the reduction of negative environmental impacts,

2. investments in technology that facilitate reductions in the use of chemicals,
3. financial resources for appropriate chemical storage site equipment.

Provision of these resources could also involve the appointment of a chemicals management specialist, whose task would be to seek improvements in reducing negative impacts on the environment or on human life. A specialist would have a budget for obtaining information, e.g. the fund participation in industry conferences or purchasing literature. On this basis, the specialist would prepare proposals for improvement projects, for which the organisation, after the suitability analysis, would designate appropriate budgets.

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| COMPETENCE AND AWARENESS (A.7.2 AND A.7.3) | In addition to the general requirements concerning resources (Sub-clause A.7.1.), an organisation shall ensure that persons acting under its control, whose work may have an impact on the environment and its compliance level, are competent. In cases where skill sets turn to be insufficient, the organisation shall take measures to ensure an appropriate level of competence.<br><br>The organisation shall also ensure that those working under the organisation's control are aware of:<br>• the organisation's environmental policy,<br>• significant environmental aspects related to their work and their actual or potential environmental impacts,<br>• the benefits of reducing negative environmental impacts,<br>• the consequences of improper conduct - both for themselves and for the organisation. |

The purpose of this requirement is to identify areas in which environmental performance level depends on the actions and attitudes of personnel. An important element of the requirement is the identification of persons whose competence can help to increase or decrease negative impacts on the environment.

Evidence of the competence of employees shall be documented.

With regard to chemicals management, the aforementioned requirements may refer to employees involved in the procurement, storage, and use of chemicals. From a life cycle perspective, it may be important to ensure that those involved in product or service design, sales, and marketing have the appropriate skill sets. It is worth noting that in some situations obtaining appropriate skill sets is a legal requirement, e.g. an advisor for the transportation of dangerous goods in organisations involved in road or rail transportation of dangerous goods, or crews of vehicles transporting dangerous goods needs specific qualifications[17]. The requirement to ensure appropriate skill sets also applies to other employees involved in the transportation of dangerous goods. The

[17] The obligation for an advisor to obtain the appropriate skill sets for the transportation of dangerous goods or for crews of vehicles transporting dangerous goods is derived from the ADR Agreement in the case of road transportation of dangerous goods and the RID Regulation in the case of rail transport.

requirement to ensure appropriate skill sets also applies to other employees involved in the transportation of dangerous goods. These skill sets should be confirmed by training in the requirements related to such transportation, in accordance with the responsibility and obligations of these persons.

In addition to ensuring that selected employees are competent in the performance of the relevant duties, all employees should be aware of chemicals management issues (regardless of the form of employment). This requirement assumes that employees who know how to act and what benefits or harms result from their behaviour will act in a responsible manner. This can be achieved through training in the management of chemicals and the risks resulting from their use. Alternatively or in addition, procedures could be agreed (e.g. in the form of documented action plans, or instructions) on how to deal with chemicals and possible emergencies. Such knowledge will result in more prudent and careful handling of chemicals.

*Information about the properties of chemicals, the hazards they pose and the methods of handling them can be found in the SDS referred to in the Appendix 6.*

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| EMPLOYEE INVOLVEMENT (B.6) | EMAS requires organisations to ensure active direct and indirect employee involvement in EMS, which needs to be recognised as a prerequisite for its effectiveness and efficiency. |

Employee involvement is strongly interrelated with requirements described in the other sections of this Guide:

1. *Leadership and commitment* (see A.5.1.) by requiring demonstration of commitment and active support from the management level,
2. *Organisational roles, responsibilities and authorities* (see A.5.3.) by requiring to establish individual roles, as well as environmental committees or workgroups supporting EMS.
3. *Competence* (see A.7.2) and *Awareness* (A.7.3) by requiring participation of employees in preparing environmental statements, providing suggestions for improvements, successfully dealing with near-misses or potential emergency situations, etc., as well as providing appropriate feedback from management to employees,
4. *Internal communication* (see A.7.4.2) by requiring establishing tools for transferring relevant information, e.g. logbooks recording suggestions for improvements.

Therefore, the aforementioned sections of this Guide need to be checked for inspiration on how to link the involvement of employees to chemicals management.

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| COMMUNICATION (A.7. 4 AND B.7)<br><br>ANNEX IV | EMAS requires organisations to communicate with internal and external interested parties (stakeholders) in the area of the environmental management.<br><br>Communication shall be conducted in an orderly manner, i.e. according to established process (or processes) determining what, when, to whom, and how to communicate. The process or processes should ensure transparency and open dialogue with interested parties. |

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| | The internal communication process should include efficient and multi-directional flow of information between the relevant positions and levels in the organisational structure.<br><br>External communication shall include informing interested parties like authorities, local communities, customers and others about the environmental impacts of their activities, products and services. At least once a year, organisations need to publish an environmental statement validated by an accredited environmental verifier. |

The purpose of this requirement is to ensure the smooth flow of information at the level necessary for effective environmental management. Efficient information flow means that the information necessary for management reaches the right people on time, which is the basis for making the right decisions and actions. Relevant persons can be both those acting on behalf of the organisation (e.g. employees) and those (e.g. customers or neighbours of the organisation) affected by the organisation activities and operations.

Evidence of communication shall be documented.

**Internal communication about chemicals**

Internal communication should include the provision of information about the properties of chemicals and conditions for their safe storage and use. The sources of information about the properties of chemicals are the labels on the packaging and safety data sheets (SDS), as well as databases, where necessary. SDS are also a source of information about:

1. proper handling and storage of chemicals - Section 7 of SDS,
2. conditions to be avoided (e.g. temperature, pressure, light, physical stress) and incompatible materials (e.g. groups of substances or specific substances with which chemicals may react leading to a hazardous situation) - Section 10 of SDS,
3. waste disposal - Section 10 of SDS,
4. transportation - Section 14 of SDS.

The information contained in the SDS should be used to draw up documents such as instructions for using chemicals in the workplace, or instructions for their storage and transportation.

**External communication about chemicals**

External communication shall include at least:

1. receiving and responding to information requests, substitution ideas and complaints from external stakeholders,
2. distribution of information about used chemicals, their hazards and risks reduction measures where this is requested or part of the documentation of the chemicals aspects in the EMS.

According to legislation, chemicals suppliers (substances and mixtures) shall provide information (down the supply chain) about the hazards of these chemicals and any information necessary to enable their safe use. The users of chemicals shall communicate with their suppliers (up the supply chain) if they have questions about the information received, cannot implement the conditions of use or need any additional information. In addition, they shall also answer to requests from their suppliers.

Examples of external communication down the supply chain (supplier to user) include:

1. labelling of hazardous chemicals,
2. safety data sheets (SDS) and information about the content of SVHC in articles,
3. documentation attached to products - e.g. information about the potential effects on the environment and human health resulting from the presence of hazardous substances, mixtures, and components in electrical and electronic equipment (RoHS Directive).

*More information about labelling of hazardous chemicals and SDS is provided in Appendix 6.*

In addition to the above, information about chemicals may be also included in the environmental statement which is referred to in the Annex IV of EMAS (see Section Environmental Statement).

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| DOCUMENTED INFORMATION (A.7.5) | Although EMAS Regulation requires organisations to keep certain documentation (as indicated in the Regulation), organisations may choose to maintain or retain information, based on their own needs. Any documentation shall be updated and reviewed to ensure that it is a useful and easy-to-use element that improves the effectiveness of the EMS. |

The purpose of this requirement is to ensure that the documents produced in connection with the functioning of the EMS improve operations and do not constitute an additional bureaucratic burden on the organisation.

Typically, documentation requirements result from the requirements of EMAS, legal requirements and communication needs. In the case of chemicals management, the latter two are particularly important.

Examples of documentation:

1. inventory of chemicals used,
2. SDS for hazardous chemicals,
3. documents describing the agreed procedures for chemicals (e.g. instructions for ordering including purchasing criteria, storage, transportation, usage, etc.),
4. measurement protocols of emissions to water and air; documentation of the disposal of hazardous waste,
5. information about the composition of own products,
6. a list of persons authorised to perform specific activities related to the chemicals,
7. instructions for the use of products that may emit chemicals,

8. specifications for subcontractors and outsourced processes regarding the hazardous chemicals used.

*More information about inventory of chemicals is provided in Appendix 7.*

Examples of documented information required by law include:

1. documents confirming the performance of training in the required field related to the transportation of dangerous goods,
2. a safety report and internal emergency plan for upper tier establishment under the SEVESO Directive.

Any documents relating to the EMS should be regularly reviewed and updated if necessary. For instance, this is important when the chemicals inventory includes quantities or regulatory requirements. It is worth emphasising that documentation is only of value when it includes current data. Therefore, it makes sense to remove references to chemicals that have been withdrawn from use from the documentation or at least store that information at another file / location in case the use of such chemicals is restarted.

EMS documentation (including chemicals-related documents) should be managed in a manner consistent with the management of other documents within the organisation.

## Operation (A.8)

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| OPERATIONAL PLANNING AND CONTROL (A.8.1) | According to EMAS, an organisation shall limit its impact on the environment to acceptable levels by defining processes and operations related to significant environmental aspects, as well as to identify threats and opportunities. This may be ensured by:<br>• adoption of established modes of conduct, e.g. in the form of procedures or instructions (not necessarily documented) indicating how the specific process or operation shall be carried out.<br>• the adoption of operational criteria, i.e. specific parameters that shall be achieved in order for the process or operation to be considered to have no greater environmental impacts than necessary.<br>An important requirement of EMAS is the inclusion of the life cycle perspective and outsourced processes in the planning and supervision of operational activities. |

The purpose of this requirement is to ensure that the negative environmental impacts of the organisation are no greater than necessary. Operational planning and control make it possible to transfer the results of the evaluation of environmental aspects and determination of risks and opportunities to an operational level within the organisation.

In regard to chemicals management, the established modes of conduct (often called procedures or instructions) shall apply to various business areas, e.g.:

1. designing processes and products, considering the minimisation / elimination of the use of hazardous chemicals,
2. determining the demand for chemicals (eliminating oversupplies),
3. procurement, e.g. centralisation and optimisation of purchases, including purchasing criteria, elimination of uncontrolled purchases,
4. logistics (if applicable)[18],
5. storage methods, e.g. physical conditions (humidity, temperature, ventilation, etc.), maximum quantities, avoidance of expiry (first in / first out), labelling of packages,
6. handling methods, e.g. specific conditions for filling and refilling,
7. methods of chemical waste management.

Modes of conduct often contain operational criteria, i.e. specific parameters indicating whether processes are carried out as planned. These may be values like maximum or minimum amounts of chemicals stored, process temperature or pressure, substance concentration, etc. (for more examples see Appendix 8).

The inclusion of a life cycle perspective in planning and controlling operational activities means that the requirement to define established modes of conduct may apply to all phases of the operational life of a product or service. This may include specific requirements for:

1. chemical suppliers (e.g. source of origin, method of delivery, type of packaging, collection of packaging),
2. chemicals characteristics (e.g. performance criteria, excluding certain hazardous substances),
3. the way the product is used by the user (including the way of storing or managing waste resulting from the use of the product),
4. supervision over subcontractors and outsourced processes.

Considering a life cycle perspective typically involves analysing the various life phases of a product or service during the design process, taking into account the potential damage from the use of products containing hazardous chemicals, e.g. ascertaining if the products contain hazardous ingredients that can be eliminated. Considering the life cycle perspective also includes the communication methods with suppliers and customers described in Section A.7.3.

Established modes of conduct and operational criteria may originate from legal or other environmental requirements (see Sub-clause 6.1.3). They may also originate from good practices applied in the sector in which the organisation operates. Adoption of the established procedures is related to the requirement to define the roles, responsibilities, and powers of employees (see Sub-clause A.5.3.)

Operational planning and control elements shall be documented to ensure that they are carried out effectively.

[18] For road or rail transportation, the ADR and RID principles may apply.

An important source for chemicals-related operational criteria can be legal requirements, or physical, chemical or ecotoxic properties of the chemicals.

*More information about sources for operational criteria is provided in Appendix 8.*

Supervision of actions and operations can be carried out by technical means retaining the desired parameters, e.g. a thermostat to ensure the desired temperature, a dispenser to ensure that the quantity of chemicals dispensed is appropriate or devices controlling the storage conditions (temperature, humidity, etc.).

*More information about sources of information about techniques related to the use of chemicals is provided in Appendix 9.*

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| EMERGENCY PREPAREDNESS AND RESPONSE (A.8.2) | EMAS requires organisations to:<br>• prevent emergency situations,<br>• prepare for their occurrence.<br><br>These shall involve technical or organisational measures, including modes of conduct (usually in the form of procedures or instructions) with the goal of eliminating or minimising the negative effects of emergency situations on the environment.<br><br>The standard requires organisations to periodically test the adopted modes of conduct and to inform or train stakeholders in this respect, including those working under the organisation's supervision. |

The purpose of this requirement is to minimise the probability of the occurrence of emergency situations, and if they do occur, to minimise their effects on the environment, humans and property.

The most common emergency situations associated with the use of chemicals are:

1. spills,
2. fire,
3. explosions.

Determination of possible emergency situations is usually carried out as part of the process of identifying environmental aspects (see A.6.1.2). Their significance may be determined using professional methods of risk analysis like event tree analysis, cause-and-effect analysis, hazard and operational capability analysis (HazOp), etc. Some of them are intended for industrial plants with a potential risk of a major accident. In other cases, simplified methods for emergency situations determination may be sufficient.

The simplest method for emergency situations determination is asking the question: 'What would happen if ...?' and relating it to all possible, even very unlikely, situations, e.g.:

- What would happen if a chemical tank at a given location, breaks and the contents leak from the tank?
- What would happen if a fire breaks out in a chemical warehouse? What would happen when all the content of this warehouse burns out? What would happen in the event that firefighting is carried out?

Preventing emergencies is often included in the operational planning and control (see A.8.1), the goal of which is the performance of operations in a safe and efficient manner. It may cover controlling the key characteristics as temperature, pressure, concentration, etc. and consequently meeting the relevant operational criteria.

Typical preventive measures related to the use of chemicals are installation, operation, and supervision of the appropriate functioning of:

1. devices measuring:
    a. concentrations of specific chemicals,
    b. fill level of tanks,
    c. flow rate,
    d. temperature,
    e. pressure, and

    initiating specific actions or alarm signals,
2. safety valves,
3. double-walled tanks,
4. trays to protect against the effects of spills, etc.

Planning for appropriate reactions to emergencies usually includes preparing emergency scenarios for situations that may adversely affect the environment or humans. Emergency scenarios include determining responsibilities, specific steps to be taken and appropriate communications (see A.7.4). People who could be involved in a rescue or evacuation need to be familiar with these scenarios, which is related to appropriate skill set and awareness levels (see A.7.2 and A.7.3).

When developing plans to respond to emergencies related to chemicals, information about the firefighting measures (Section 5 of SDS) and environmental precautions (Section 6.2 of SDS) should be considered. Information about chemical stability (Section 10.2 of SDS), the possibility of dangerous reactions, e.g. the excessive generation of heat (Section 10.3 of SDS) and the hazardous decomposition of products (Section 10.6 of SDS) may also be useful.

At this point, it is worth mentioning that upper tier establishments under the SEVESO Directive are required to prepare documents describing the identified hazards and risk assessment of a major accident which contain information about measures necessary to prevent accidents (safety report and internal plans). These can be an important part of chemicals management.

Additionally, it is also worth noting that identified emergency situations may apply to another phase of the life cycle of the product, one different to the one that is subject to full control of the organisation holding the EMS. In such a case, best practice is to prepare data for the organisation overseeing the life cycle phase, where the emergency situation may occur, in order to assist in planning their emergency procedures sufficiently.

In the case of networks for the transmission of chemicals (e.g. pipelines), it is important to prepare them so that faults (e.g. leaks) can be detected as soon as possible after their occurrence.

Emergency preparedness may also cover the transportation of hazardous chemicals. In the special case of transporting dangerous goods, the provisions of both the ADR Agreement (in the case of road transport), and the RID Regulations (in the case of rail transport) apply.

Emergency preparedness and response elements shall be documented in order to ensure that they are carried out effectively.

## Performance evaluation (A.9)

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| MONITORING, MEASUREMENT, ANALYSIS, AND EVALUATION (A.9.1) | EMAS requires organisations to monitor and measure the environmental effects of their activities, as well as to analyse and evaluate the results of the monitoring and measurements. This process includes determining:<br>• parameters to be monitored and measured,<br>• methods of their conduct,<br>• the indicators used and the criteria for evaluating the results,<br>• schedule of monitoring and measurements,<br>• modes of conduct analyses, and assessment results of monitoring and measurement.<br><br>An important part of the criteria for assessing the results of monitoring and measurement are compliance obligations, including the needs and expectations of stakeholders. EMAS stipulates that an organisation shall provide supervision of measuring equipment used if this equipment could affect the reliability of the results. |

The purpose of this requirement is to provide reliable data necessary to assess the effectiveness of an EMS, i.e.:

1. compliance with legal and other environmental requirements,
2. meeting internal operational criteria,
3. the level of achievement of environmental objectives,

4. the level of improvement in environmental performance.

Outcomes of the described processes shall be documented in order to ensure that they are carried out effectively.

With regard to chemicals management, the elements that can be monitored include:

1. technical parameters, e.g.
    a. the amount of hazardous chemicals used for particular purposes,
    b. physical conditions related to storage (temperature, humidity),
    c. concentration of substances in mixtures and solutions,
    d. hazardous substance content in a product,
    e. fill level of tanks,
    f. flow rate.
2. organisational issues, e.g.
    a. implemented emission and exposure reduction measures, regarding chemicals
    b. number of labels or instructions changed for products on the market to increase transparency.

In terms of the life cycle perspective, monitoring may also include tracking the practices of suppliers and subcontractors, as well as the level of fulfilment of needs and expectations of external stakeholders, and the level of their environmental impact in relation to the use of products of the organisation maintaining the management system.

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| INTERNAL AUDIT (A.9.2) | EMAS requires organisations to plan and conduct internal audits in order to assess whether the EMS operates in accordance with:<br>• the requirements established by the organisation as part of the EMS,<br>• the requirements of the standard.<br><br>Audits shall be conducted by competent and impartial auditors. |

The purpose of this requirement is to verify the level of compliance of the organisation's activities with the adopted procedures, identify any deficiencies and provide management with information about the verification results.

Information regarding planning and performance of internal audits shall be documented.

With regard to the chemicals management, internal audits shall ascertain whether all established procedures (e.g. concerning ordering, storing and using chemicals) are applied in practice. Audit activities may include:

1. physical inspection of locations where hazardous chemicals are stored or used, and their wastes are managed to check if the established procedures are applied, including those about accident prevention, and analysis of data relating to:
    a. quantities of supplied / stored / consumed chemicals,

b. the amount of chemical waste,
c. mass balances for individual processes / products,

2. interviews with the personnel responsible for managing chemicals.

Where applicable, audits may also cover the practices of suppliers and contractors of outsourced processes (subcontractors).

In the context of the internal audit process, it may be valuable to carry out periodic (e.g. weekly/monthly) inspections to assess, for example, the state of emergency protection, and to identify new potential sources of chemical safety hazards that could increase the risk of accidents.

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| MANAGEMENT REVIEW (A.9.3) | EMAS requires organisations' top management to periodically evaluate the suitability, adequacy, and effectiveness of the EMS. As part of the management review, management should assess changes in:<br>• the context of the organisation, including the needs and expectations of interested parties (see Sub-clauses A.4.1. and A.4.2.),<br>• environmental aspects and the result of their evaluation,<br>• risks and opportunities for the organisation.<br><br>Management should also assess the environmental performance and opportunities for improvement. |

The purpose of this requirement is to assess the effectiveness of the EMS at the highest level of management in the organisation and to indicate directions for changes aimed at improving this effectiveness.

Management reviews, including their outputs, shall be documented.

In terms of the chemicals management, a management review may include the following measures:

1. assessment of the feasibility of substituting chemicals in processes or products, which would reduce the negative environmental impacts on the environment and humans,
2. priority setting with regard to improvement activities in the companies – do the priorities correspond to the company policy and address the most relevant impacts?
3. cost-benefit analysis of the implemented/planned measures,
4. results of external studies on the impact of the chemicals used on the environment and humans (at different stages of the life cycle),
5. comparison with competitors and sector standards,
6. consideration of scientific developments and policy discussion – does the company follow the trends and/or contradict the state of the art?

7. feedback from contractors regarding complaints from consumers,
8. information about changes in the law, e.g. likely ban of chemicals used by the organisation.

## Improvement (A.10)

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| GENERAL AND CONTINUAL IMPROVEMENT (A.10.1 AND A.10.3) | EMAS requires organisations to constantly seek and implement actions to improve the suitability, adequacy, and effectiveness of the EMS and, consequently, enhance its environmental performance and achieve the intended outcomes of the EMS.<br><br>Continual improvement shall be based on the results of monitoring and measurement, compliance evaluation, internal audits, and management review performed by top management. |

This requirement relates to chemicals in case they have been identified as environmental aspects of an organisation. In practice, this could mean that management assesses whether the implemented measures lead to reduced environmental emissions of hazardous substances into the environment. Any increase in ambition level could be expressed in the form of more ambitious goals, e.g. avoiding the use of further hazardous substances.

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| NONCONFORMITY AND CORRECTIVE ACTION (A.10.2) | In addition to Sub-clauses A.10.1. and A.10.3. of EMAS, Sub-clause A.10.2. requires organisations to establish a process of planning and implementing corrective actions with regard to any identified non-conformities, including:<br>• removing the effects of the occurrence of non-conformities (e.g. remediation),<br>• review of non-conformities, including determination of the root causes of their occurrence,<br>• implementation of actions eliminating the causes of non-conformities, including changes to the EMS, if necessary,<br>• assessment of the effectiveness of the activities carried out. |

The purpose of this requirement is to strengthen the continual improvement mechanism by establishing an effective process of eliminating nonconformities and their re-occurrence.

Nonconformities, their characteristics, actions taken, and the results of these actions shall be documented.

These requirements do not specifically relate to the chemicals management. They relate to all areas linked to having an impact on the environment. For the area of the chemicals management, the mechanism of action remains the same. In certain cases, the improvement-related elements may result in setting environmental objectives, referred to in Sub-clause A.6.2. of Annex II to the EMAS.

## Environmental Statement (Annex IV)

The minimum scope of information to be included in the environmental statement does not explicitly address chemicals, however, environmental statement must communicate information about:

1. significant environmental aspects,
2. environmental objectives and targets,
3. a summary of the data available on the performance of the organisation against its environmental objectives and targets with respect to its significant environmental impacts.

With the aforementioned criteria in mind, if an organisation has determined significant environmental aspects, established environmental objectives or is subject to legal or other requirements related to chemicals, it may be necessary to address chemicals in the environmental statement. It needs to be underlined that the list of so-called "core indicators" given in Section C p. 2 of Annex IV to EMAS should by no means be considered to be an exhaustive list. Other environmental performance indicators must be communicated if they are relevant to the organisation's environmental aspects.

Thus, information associated with chemicals management need to be communicated in case an organisation finds itself subject to legal requirements related to chemicals or when hazardous chemicals are addressed in the sectoral reference documents (SDRs) published by the European Commission.

Regardless of the explicit requirements that an organisation may decide to integrate into its environmental statement, additional factual information related to the activities, products and services of the organisation or to their compliance with specific requirements may also be provided. This may include information associated with chemicals management, however it needs to be remembered that all information contained in the environmental statement must be validated by the environmental verifier. On the other hand, organisations may choose to integrate information required in Annex IV of EMAS in other reporting documents of the organisation (e.g. financial, sustainability or corporate social responsibility reports). When integrated into such reporting documents, a clear distinction shall be made between validated and non-validated information.

One should note that IED requires that "the relevant information set out in the EMS and listed in Paragraph 2 is made available on the internet, free of charge and without restricting access to registered users." This requirement adheres to the transparency concept promoted in EMAS.

As Paragraph 2 of IED article 14a refers to "chemicals inventory" and "a risk assessment of the impact of such substances on human health and the environment, as well as an analysis of the possibilities for substituting them with safer alternatives or reducing their use or emissions", it can be concluded that to some extent information about hazardous substances and related impact on human health and environment will become a mandatory element of publicly available information.

The ultimate scope of the mandatory disclosure in this respect will be determined in the implementing act to be published by 31 December 2025.

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# APPENDICES

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# Appendix 1 – Substances that could become or are subject to authorisation and restrictions, and to which special provisions apply

1. REACH candidate list for authorisation – this list (not part of the legislation) includes substances of very high concern (SVHC), which may become subject to authorisation in the future and for which communication is required in the EU if they are contained in articles above 0.1% w/w.,
2. REACH authorisation list (Annex XIV) contains SVHCs which may not be used anymore, unless an authorisation has been granted. Authorisations may apply to individual companies and/or their supply chains. In the latter case, an authorisation number must be provided with the chemical,
3. REACH Annex XVII listing substances subject to restrictions. Restrictions may concern the manufacture and/or placing on the market and/or use of certain substances or substance groups as such, in mixtures or in articles. Each restriction in the Annex specifies what is restricted and under what conditions,
4. priority substances under EU water policies - Annex X of the Water Framework Directive[19] contains substances identified as priority substances that are targeted for reduction and eventual phase-out and hence removal from (waste) water discharges; the list includes 'priority hazardous substances' which are subject to special restrictions,
5. restrictions in electrical and electronic equipment – substances in the list provided as Annex II to the RoHS[20] Directive may not be contained in the equipment in concentrations exceeding defined levels in a homogeneous material,
6. restrictions in packaging - the substances are indicated in art. 11 of the Packaging Directive[21]; the list includes substances whose concentration in the packaging may not exceed the given levels,
7. *Note: Packaging Directive will be repealed with effect from 12 August 2026 by the Packaging and Packaging Waste Regulation[22]; the substances restricted in the packaging are indicated in art. 5 of the PPWR,* dangerous goods – listed in section 3 of the ADR Agreement; the list includes goods classified as dangerous, to which special provisions concerning their carriage by road apply.

[19] Directive 2000/60 / EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.
[20] Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast).
[21] European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste.
[22] Regulation (EU) 2025/40 Of The European Parliament And Of The Council of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC.

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# Appendix 2 – EUCLEF - Chemicals legislation search engine for the European Community

EUCLEF, the EU Chemical Law Finder, provides an overview of the European Union's legislation on chemicals. It is an online tool that allows organisations to search for information on substances they use, find applicable laws, and check what obligations they may have.

The information contained in the EUCLEF include, among others, EU legislation in the field of:

1. air emissions,
2. waste, including used batteries and accumulators, packaging and packaging waste, electrical waste and electronic equipment, the content of hazardous substances in electrical and electronic equipment,
3. water and sewage management,
4. exposure to chemical agents and chemical safety,
5. food safety and food contact materials,
6. products: cosmetics, detergents, toy safety, fertilisers.

EUCLEF also provides information on specific pieces of legislation including their scope, key requirements, exemptions and lists of impacted substances. The database also includes links to full legal texts in all EU languages.

EUCLEF is available on the European Chemicals Agency website: https://echa.europa.eu/en/information-on-chemicals/euclef

Information for individual substances can be found in ECHA CHEM, ECHA's public chemicals database.

ECHA CHEM provides an information from all REACH registrations, Classification and Labelling Inventory and Regulatory lists and processes under REACH Regulation, CLP Regulation, Drinking Water Directive and POPs Regulations.

Information on substances contains:

1. information identifying the substance,
2. classification of the substance according to CLP Regulation with an indication of the most important hazard properties of the substance and its labelling,
3. industry self-classification of the substance,
4. review of substance-related legislation.

ECHA CHEM is available on the European Chemicals Agency website:

https://chem.echa.europa.eu/

Note: Over the coming years, ECHA will continue to transfer datasets from their current location (Search for chemicals) to ECHA CHEM. During the transition, users may need to consult both ECHA CHEM and the former platform.

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# Appendix 3 – Examples of types of legal requirements on chemicals

Legal requirements for chemicals can take the form of:

1. **ban for placing on the market:**

EXAMPLE: REACH Regulation, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures, and articles, entry 26https://translate.googleusercontent.com/translate_f

| Column 1<br>Designation of the substance, of the group of substances or of the mixture | Column 2<br>Conditions of restriction |
|---|---|
| Monomethyl-dibromo-diphenyl methane bromobenzylbromotoluene, mixture of isomers<br>Trade name: DBBT<br>CAS No 99688-47-8 | Shall not be placed on the market, or used, as a substance or in mixtures.<br>Articles containing the substance shall not be placed on the market. |

2. **specific use restrictions:**

EXAMPLE: REACH Regulation, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures, and articles, entry 8

| Column 1<br>Designation of the substance, of the group of substances or of the mixture | Column 2<br>Conditions of restriction |
|---|---|
| Polybromobiphenyls; Polybrominatedbiphenyls (PBB)<br>CAS No 59536-65-1 | 1. Shall not be used in textile articles, such as garments, undergarments and linen, intended to come into contact with the skin.<br>2. Articles not complying with paragraph 1 shall not be placed on the market. |

3. **conditions of use/placing on the market:**

EXAMPLE: REACH Regulation, Annex XVII restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures, and articles, entry 23

| Column 1<br>Designation of the substance, of the group of substances or of the mixture | Column 2<br>Conditions of restriction |
|---|---|
| Cadmium<br>CAS No 7440-43-9<br>EC No. 231-152-8 and its compounds | (...)<br>10. Shall not be used or placed on the market if the concentration is equal to or greater than 0,01 % by weight of the metal in:<br>(i) metal beads and other metal components for jewellery making,<br>(ii) metal parts of jewellery and imitation jewellery articles and hair accessories, including:<br>— bracelets, necklaces, and rings,<br>— piercing jewellery,<br>— wrist-watches and wrist-wear,<br>— brooches and cufflinks.<br>11. By way of derogation, paragraph 10 shall not apply to articles placed on the market before 10 December 2011 and jewellery more than 50 years old on 10 December 2011. |

Note: In examples shown above, an article is understood, in accordance with the definition of the REACH Regulation, as an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition

**4. conditions for placing on the market of substances and mixture:**

EXAMPLE:

Article 4.1. of the CLP Regulation

'Manufacturers, importers and downstream users shall classify substances or mixtures in accordance with Title II before placing them on the market...'

Article 4.4. CLP Regulation

'Where a substance or mixture is classified as hazardous, suppliers shall ensure that the substance or mixture is labelled and packaged in accordance with Titles III and IV, before placing it on the market.'

Article 17.1 of the CLP Regulation

'A substance or mixture classified as hazardous and contained in packaging shall have a label including the following elements:

a. the name, address, and telephone number of the supplier(s),
b. the nominal quantity of the substance or mixture in the package made available to the general public, unless this quantity is specified elsewhere on the package,
c. product identifiers,
d. where applicable, hazard pictograms,
e. where applicable, signal words,
f. where applicable, hazard statements,
g. where applicable, the appropriate precautionary statements,
h. where applicable, a section for supplemental information.'

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# Appendix 4 – List of regulatory acts applicable to the chemicals management (non-exhaustive)

1. Acts of international law:
    a. Agreement concerning the international carriage of dangerous goods by road (ADR), Geneva, 30 September 1957
    b. Convention Concerning International Carriage by Rail (COTIF) established in Bern on 9 May 1980.
    c. Stockholm Convention on Persistent Organic Pollutants, Stockholm Convention, 22 May 2001.

2. European Union legal acts:
    a. Regulations:
    - 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
    - Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006
    - Regulation (EU) 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants
    - Commission Regulation (EU) No 10/2011 of 14 January 2011 on plastic materials and articles intended to come into contact with food
    - Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products
    - Regulation (EC) No 2003/2003 of the European Parliament and of the Council of 13 October 2003 relating to fertilisers
    - Regulation (EC) No 648/2004 of the European Parliament and of the Council of 31 March 2004 on detergents,
    - Regulation (EC) No 1935/2004 of the European Parliament and of the Council of 27 October 2004 on materials and articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC,
    - Regulation (EU) 2023/1542 of the European Parliament and of the Council of 12 July 2023 concerning batteries and waste batteries, amending Directive 2008/98/EC and Regulation (EU) 2019/1020 and repealing Directive 2006/66/EC
    - Regulation (EU) 2025/40 Of The European Parliament And Of The Council of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC

    *Note: Regulation (EU) 2025/40 Of The European Parliament And Of The Council of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC will repeal with effect from 12 August 2026*

*the European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste*

b. Directives:

- Directive 2012/19 / EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)
- European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste
- *Note: European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste will be repealed with effect from 12 August 2026 by the Regulation (EU) 2025/40 Of The European Parliament And Of The Council of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC*
- Directive 2011/65 / EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast)
- Directive 2000/60 / EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy
- Commission Directive 2007/42 / EC of 29 June 2007 relating to materials and articles made of regenerated cellulose film intended to come into contact with foodstuffs
- Directive 2014/28 / EU of the European Parliament and of the Counsel of 26 February 2014 on the harmonisation of the laws of the Member States relating to making available on the market and supervision of explosives for civil uses (recast)
- Directive 2009/48 / EC of the European Parliament and of the Council of 18 June 2009 on the safety of toys
- Directive 2012/18 / EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82 / EC
- Directive 2008/68 / EC of the European Parliament and of the Council on the inland transportation of goods
- Council Directive 95/50 / EC of 6 October 1995 on uniform procedures for checks on the transport of dangerous goods by road

c. Decisions:

- Commission Implementing Decision (EU) 2022/2110 of 11 October 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the ferrous metals processing industry,
- Commission Implementing Decision (EU) 2022/2427 of 6 December 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for common waste gas management and treatment systems in the chemical sector,
- Commission Implementing Decision (EU) 2022/2508 of 9 December 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the textiles industry,
- Commission Implementing Decision (EU) 2023/2749 of 11 December 2023 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European

Parliament and of the Council on industrial emissions, for slaughterhouses, animal by-products and/or edible co-products industries,

- Commission Decision (EU) 2017/1508 of 28 August 2017 on a reference document on best environmental management practices, sector environmental performance indicators, and benchmarks of excellence for the food and drink manufacturing sector under Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco - management and audit scheme (EMAS),
- Commission Decision (EU) 2016/611 of 15 April 2016 on a reference document on best environmental management practices, sector environmental performance indicators, and benchmarks of excellence for the tourism sector under Regulation (EC) No 1221/2009 on the voluntary participation of organisations in the Community Eco - Management and Audit Scheme (EMAS),
- Commission Decision (EU) 2018/813 of 14 May 2018 on the sectoral reference document on best environmental management practices, sector environmental performance indicators, and benchmarks of excellence for the agricultural sector under Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco - management and audit scheme (EMAS).

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# Appendix 5 – Examples of environmental objectives for chemicals

**EXAMPLE 1. ELIMINATION OF PRESERVATIVES AND SURFACTANTS FROM THE CHILDREN COSMETICS LINE**

The organisation producing both cosmetics and cleaning agents uses preservatives (methylisothiazolinone (MIT) and methyl-chloroisothiazolinone (CMIT)), surfactants (sodium lauryl sulphate (SLS)), fragrances and phosphates in the production process.

CMIT / MIT are popular preservatives used in cosmetics to protect against the development of microorganisms that may be introduced into the product through contact with the skin or the environment. Pursuant to Regulation (EC) No 1223/2009 of the European Parliament and of the Council of 30 November 2009 on cosmetic products (Journal of Laws L 342 of 22.12.2009, as amended), they have been approved for use in cosmetics made available on EU markets under the following conditions:

1. mixture of CMIT and MIT in a ratio of 3:1 - the maximum concentration in the ready-to-use preparation (rinse-off products) may be 0.0015%,
2. MIT - the maximum concentration in the ready-to-use preparation (rinse-off products) may be 0.0015%,
3. it is forbidden to use a MIT alone and mixture of CMIT and MIT in the same product.

SLS is one of the most frequently used anionic surface-active substance in cosmetics for washing both hair and body. SLS causes a potential irritant effect when used as a single substance in an aqueous solution.

There is an evidence of MIT/CMIT's sensitising effects and information from the dermatological community indicating an increase in the incidence of allergic reactions to MIT / CMIT. As a result, consumers' interest in cosmetics, that do not contain these substances, has increased. Similarly, due to the irritating effects that SLS can cause, increased consumers' interest in cosmetics that do not contain it has been noted. Moreover, there has been a growing trend to eliminate SLS from the cosmetics introduced to the market.

Despite the lack of a ban on the use of these substances, due to the needs and expectations expressed by consumers, the organisation decided to take them into account when setting objectives in the area of the chemical use.

*The following objective was adopted:*

Eliminating by the end of the next calendar year exposure of children to MIT/CMIT and SLS by completely substituting these substances from all children's cosmetics.

**EXAMPLE 2. UPGRADING THE STORAGE OF HAZARDOUS CHEMICALS**

An organisation from the food industry uses hazardous chemicals in; the processes of washing production lines and halls, maintenance, and wastewater treatment. Chemicals used to clean production lines and halls are stored in a room specially adapted for this purpose. On the other hand, the remaining chemicals are stored in different places without considering their properties and the use of protective measures against environmental pollution.

*The following objective was adopted:*

To minimise the risk of environmental pollution as a result of a spill of hazardous chemicals or as a result of an undesirable reaction between chemicals by adapting, by the end of this year, the method of storing chemicals used for the purposes of maintenance and sewage treatment to the requirements specified in the SDS .

Tasks:

1. preparation/update of an inventory of the chemicals used and review of the validity of the available SDS,
2. analysis of the physicochemical properties of the stored chemicals in order to determine the possibility of their joint storage and the rules of storage,
3. preparation of instructions for storing hazardous chemicals in the warehouse (designating an appropriate method and places for storing hazardous chemicals),
4. purchase of a container (warehouse) for storing chemicals.

**EXAMPLE 3. OPTIMISATION OF DETERGENTS AND DISINFECTANTS USE IN ICE CREAM PRODUCTION**

The ice cream producing company uses significant quantities of detergents and disinfectants to ensure hygiene and food safety. These chemicals are applied for the cleaning and disinfection of production equipment and surfaces, air in production areas, and a separate cold room used for ice cream hardening.

Although the use of hazardous chemicals is unavoidable to meet strict hygiene requirements, the organisation actively manages chemical risks through organisational and managerial measures. In order to further improve chemicals management and reduce the overall chemical load, the company carried out an internal assessment of its cleaning and disinfection practices. As a result, several technical measures were identified that allow a reduction in the quantity of detergents and disinfectants used without compromising hygiene standards.

The planned measures aim to increase resource efficiency by improving the effectiveness of chemical application against bacteria and viruses in the air and on surfaces. These measures target largely the same groups of detergents and disinfectants and are expected to work in synergy, leading to a cumulative reduction in chemical use and a lower environmental and occupational risk.

*The following objective was adopted:*

To reduce the consumption of detergents and disinfectants used in production, equipment cleaning, and cold room sanitation by implementing resource-efficient technical measures, while maintaining full compliance with food hygiene requirements.

**EXAMPLE 4. REDUCTION OF HAZARDOUS CHEMICAL USE THROUGH AUTOMATION OF CONFORMAL COATING PROCESS**

The smart electricity meter producer operates an advanced chemical risk management (CRM) system and uses a relatively limited range of chemicals. The main production step involving chemicals is the assembly of printed circuit boards (PCBs).

To ensure product durability and resistance to moisture, conformal coating is applied to PCBs, creating a protective film that allows the meters to operate reliably in various environmental conditions. While this process significantly increases product value, the existing coating operation relies partly on manual application. As a result, the thickness of the coating layer is difficult to control, leading to the overuse of conformal coating materials and associated solvents containing volatile organic compounds (VOCs), including substances with reprotoxic properties. This creates unnecessary risks to workers' health and the environment, as well as increased chemical consumption and waste generation.

Within the FFR-2 project, the company decided to focus on improving this production step by automating the conformal coating process. The planned installation of a conformal coating robot will enable precise application of coating materials, opening the possibility to substitute hazardous substances and significantly reduce chemical use. In addition to chemical risk reduction, automation will improve resource efficiency, product quality, and process control, while decreasing VOC emissions, the need for personal protective equipment, and the generation of hazardous waste.

*The following objectives were adopted:*

1. To reduce chemical risks, VOC emissions, and hazardous chemical consumption in PCB production by automating the conformal coating process
2. to further strengthen the company's chemical risk management by improving the chemicals inventory and increasing employees' awareness of chemical hazard classes.

The timing for implementing the above was co-ordinated with the FFR-2 project to ensure financing.

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**EXAMPLE 5. SUBSTITITION OF TPO IN NAIL GELS PRODUCTION COMPANY**

Kinetics Nail Systems offers a variety of nail products for professionals. As the company is commitment to product safety, regulatory compliance, and responsible innovation it adopted the following principles:

1. Continuous review of raw materials
2. Investment in safer and more sustainable technologies
3. Alignment with upcoming regulatory changes, not just current ones
4. Collaboration between industry, scientists, and educators

As a result of the raw materials review use of TPO (Trimethylbenzoyl Diphenylphosphine Oxide) was determined. TOP is a UV-curable systems ingredient commonly used photoinitiator, valued for its fast curing performance. However, in recent years:

1. scientific and toxicological assessments have raised concerns about its potential reproductive toxicity.
2. regulatory authorities in the EU have moved towards restricting and banning TPO in cosmetic products.
3. TPO has been classified under CLP Regulation as a CMR substance (Carcinogenic, Mutagenic or Reprotoxic - Category 1B).

Based on the above Kinetics' decided that TPO is no longer suitable for long-term use in cosmetic products applied directly to the human body.

*The following objective was adopted.*

To fully replace TPO from Kinetics' products within 12 months ie. ahead of mandatory regulatory deadlines, reflecting its philosophy of not waiting for minimum requirements.

As replacing TPO requires significant reformulation, testing, and validation, rather than just cosmetic adjustments, the following action plan was established:

1. Develop alternative photoinitiator systems with improved toxicological profiles
2. Maintain curing performance, color stability, and durability
3. Ensure compatibility with professional lamps and salon workflows
4. Validate formulations through internal testing and quality control

The company acted early, being ready for the EU's ban that went into force from September 1, 2025.

The substitution of TPO is a part of broader company strategy where overarching aims include:

5. Continuous review of raw materials
6. Investment in safer and more sustainable technologies
7. Alignment with upcoming regulatory changes, not just current ones
8. Collaboration between industry, scientists, and educators

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# Appendix 6 – Examples of external communication tools

**Labelling of hazardous chemicals**

Classification is the starting point for hazard communication. It involves the identification of a chemical's hazard(s) according to hazard categories that are legally defined via specific criteria. Identified hazards need to be communicated to the user via the chemical label. Standardised symbols and hazard statements are used for this. Additionally, standardised statements also exist about precautionary measures that users should implement.

In the EU, the Regulation on Classification, Labelling and Packaging of Chemicals defines the classification rules and contains a catalogue of standardised hazard and precautionary statements. This regulation is based on the United Nations' Globally Harmonised System of Classification and Labelling of Chemicals (GHS), which sets up respective rules, criteria and language at the global level.

The chemical label should be permanently attached to the package in one or more places and shall contain the following information:

1. supplier's name, address, and telephone number,
2. the nominal quantity of the substance or mixture in the packages made available to the general public (unless this quantity is specified elsewhere on the package),
3. product identifiers,
4. where appropriate, hazard pictograms, signal words, hazard statements, precautionary statements and additional information required under other legislation.

Some labelling exceptions apply, for example, to hazardous chemicals contained in small packaging (usually less than 125 ml) or otherwise difficult to label.

ECHA published a guidance document to support the implementation of classification and labelling (http://echa.europa.eu/guidance-documents/guidance-on-reach

**Safety data sheets (SDS)**

The United Nations' Globally Harmonised System of Classification and Labelling of Chemicals (GHS) also defines the structure of safety data sheets (SDS) and that they should be supplied for all classified chemicals. SDSs are one of the tools for chemical hazard communication under GHS. The requirements on safety data sheets are implemented in the REACH regulation at EU level.

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SDS should provide comprehensive information about the chemical product that allows employers and workers to obtain concise, relevant, and accurate information in perspective to the hazards, including environmental hazards, uses, and risk management of the chemical product in the workplace. The information acts as a reference source for the management of hazardous chemicals and enables the employer to develop an active programme of worker protection measures and to consider any measures which may be necessary to protect the environment.

In the chemicals management, it is important that the information is correct and useful, and therefore good quality should be ensured.

A checklist to assess the quality of the SDS can be found at:

https://www.fitreach.eu/content/tools

*It has been developed as a part of the Life Fit-for-REACH project:*

https://www.fitreach.eu/

The required format and content of a SDS within the EU Member States is defined in Annex II of REACH Regulation.

According to the REACH Regulation, the obligation to pass SDS on to downstream users applies to:

1. a substance or mixture classified as hazardous in accordance with the CLP Regulation,
2. a substance that is persistent, bio accumulative and toxic (PBT) or very persistent and very bio accumulative (vPvB), or
3. substances on the Candidate List of Substances of Very High Concern (SVHC).

A supplier may be obliged to provide SDS on request of a downstream user if a mixture is also not classified as hazardous in accordance with the CLP Regulation. This is the case if a mixture contains:

1. at least one substance posing human health or environmental hazards in a concentration of ≥ 1% by weight for non-gaseous mixtures and ≥ 0,2% by volume for gaseous mixtures,
2. at least one substance in a concentration of ≥ 0,1% by weight for non-gaseous mixtures that is classified as one of the following:
    a. carcinogenic category 2, or
    b. toxic to reproduction category 1A, 1B and 2, or
    c. skin sensitiser category 1, or
    d. respiratory sensitiser category 1, or
    e. has effects on or via lactation,
    f. is persistent, bioaccumulative and toxic (PBT),
    g. very persistent and very bioaccumulative (vPvB),
3. at least one substance in a concentration of ≥ 0,1% by weight for non-gaseous mixtures that has been included for reasons other than those referred to in point a) in the Candidate List of Substances of Very High Concern (SVHC),
4. a substance for which there are EU workplace exposure limits.

Information on the issues to be taken into account in the preparation of SDS and detailed information on the requirements relating to information published in various sectors of the SDS are discussed in the Guidance on the compilation of the safety data sheets, European Agency. Chemicals, version 3.1., November 2015, which can be found at:

https://echa.europa.eu/documents/10162/2324906/sds_en.pdf/01c29e23-2cbe-49c0-aca7-72f22e101e20

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# Appendix 7 – Inventory of chemicals

An essential part of a good chemicals management in an organisation having a complete inventory of the chemicals used. It should contain all the information necessary to ensure the correct and safe use of chemicals and help identify any problematic issues that may arise (e.g. no access to a SDS).

The information on the chemicals used that needs to be collected and listed will vary by organisation.

An example of the scope of information that should be collected and available in most cases:

1. general information:
    a. product name,
    b. name of the substance as such or as ingredient in a mixture,
    c. concentration of a substance in a mixture,
    d. supplier of the substance or mixture,
    e. manufacturer of the substance or formulator of the mixture,
    f. date of issue / latest update of SDS,
    g. physical state.
2. substance identification:
    a. CAS number,
    b. EC number,
    c. REACH registration number.
3. classification of the substance / mixture:
    a. hazard pictogram,
    b. a signal word,
    c. hazard statements,
    d. precautionary statements.
4. use of the substance / mixture:
    a. the process by which the substance is used,
    b. does the substance remain in the article?
5. storage of the substance / mixture:
    a. the maximum quantity allowed for storage,
    b. storage method,
6. other information:
    a. maximum annual consumption,
    b. waste classification,
    c. additional information.

As stated already in the section ***Actions to address risks and opportunities - General*** *(A.6.1.1)* the inventory of chemicals is a mandatory element of the EMS according to IED.

A template for inventory of chemicals used can be found at:

https://www.fitreach.eu/content/tools

*It has been developed as part of the Life Fit-for-REACH project:*

https://www.fitreach.eu/

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# Appendix 8 – Examples of sources for the operational criteria for chemicals management

1 Legal requirements:

restrictions on use, e.g.:

a. REACH Regulation, Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures, and articles[23] - the maximum concentration of free benzene in toys or toy parts is 5 mg/kg (0.0005%) of the weight of the toy or its element,

b. RoHS directive [24] - e.g. the maximum value of the permissible weight concentration in homogeneous materials in electrical and electronic equipment in the case of lead is 0.1%,

c. Paints Directive[25] - e.g. the maximum VOC content in water-borne interior or exterior paints for wooden, metal or plastic finishes and cladding is 130 g/l of the ready-to-use product,

d. types and quantities of hazardous substances present in the plant specified in the SEVESO Directive - e.g. the threshold amount of anhydrous ammonia for a lower tier establishment is 50 Mg, and for an upper tier establishment - 200 Mg; the threshold quantity for flammable aerosols is 150 Mg net for a lower tier establishment and 500 Mg net for an upper tier establishment.

2 Physical and chemical properties of the chemicals, e.g.:

a. solidification point - ensuring the appropriate storage temperature,

b. vapour pressure - ensuring adequate ventilation of storage places, ensuring an appropriate method of storage preventing the volatilisation of substances under normal conditions,

c. explosion limit - providing appropriate storage conditions to prevent the formation of the explosive mixtures.

> EXAMPLE:
>
> In accordance with the SDS the freezing point of a 50% solution of sodium hydroxide is 15°C.
>
> In order to avoid the change from liquid to solid, the hydroxide should be stored at an appropriate temperature.
>
> As an operational criterion, a specific value of the storage temperature above 15°C should be adopted.

For information on the physical and chemical properties of the chemical see section 9 of the SDS. The information on conditions that should be avoided included in section 10.4 of the SDS may also be useful.

[23] In this case, an article is understood, in accordance with the definition contained in the REACH Regulation, as an object which during production is given a special shape, surface or design which determines its function to a greater degree than does its chemical composition

[24] Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment

[25] Directive 2004/42/CE of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC

3 Other sources of operational criteria:

a. the expiry date of the chemicals used, which should be monitored so as not to generate losses and waste,

b. properties of chemicals affecting the storage - rules for joint storage of chemicals that may react with each other, or have a destructive effect on the packaging of chemicals (the source of information may be the section 10.5 of the SDS).

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# Appendix 9 – Sources of information on techniques related to the use of chemicals

Techniques related to the use of chemicals are described on a general level in some BAT Conclusions for installations subject to the obligation to obtain an integrated permit, published in implementing decisions of the European Commission, e.g.:

1. Commission Implementing Decision (EU) 2022/2110 of 11 October 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the ferrous metals processing industry,
2. Commission Implementing Decision (EU) 2022/2427 of 6 December 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for common waste gas management and treatment systems in the chemical sector,
3. Commission Implementing Decision (EU) 2022/2508 of 9 December 2022 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for the textiles industry,
4. Commission Implementing Decision (EU) 2023/2749 of 11 December 2023 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions, for slaughterhouses, animal by-products and/or edible co-products industries.

More details can be found in the corresponding BAT Reference Documents published at:
https://eippcb.jrc.ec.europa.eu/reference .

Another source of information is sectoral reference documents published under Art. 46 of EMAS, e.g.:

1. Commission Decision (EU) 2017/1508 of 28 August 2017 on the reference document on best environmental management practice, sector environmental performance indicators and benchmarks of excellence for the food and beverage manufacturing sector under Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS),
2. Commission Decision (EU) 2016/611 of 15 April 2016 on the reference document on best environmental management practice, sector environmental performance indicators and benchmarks of excellence for the tourism sector under Regulation (EC) No 1221/2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS),
3. Commission Decision (EU) 2018/813 of 14 May 2018 on the sectoral reference document on best environmental management practices, sector environmental performance indicators and benchmarks of excellence for the agriculture sector under Regulation (EC) No 1221/2009 of the European Parliament and of the Council on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS).

More details can be found in the corresponding Best Practice Reports published at:

https://ec.europa.eu/environment/emas/emas_publications/sectoral_reference_documents_en.htm

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# Appendix 10 – Requirements regarding chemicals management system according to BAT for the textiles industry.

BAT is to elaborate and implement a chemicals management system (CMS), as part of the EMS (see BAT 1), that incorporates all of the following features:

1. A policy to reduce the consumption and risks associated with process chemicals, including a procurement policy to select less harmful process chemicals and their suppliers with the aim of minimising the use and risks associated with hazardous substances and substances of very high concern as well as avoiding the procurement of an excess amount of process chemicals. The selection of process chemicals is based on:
    a. the comparative analysis of their bioeliminability/biodegradability, ecotoxicity and potential to be released into the environment (which in the case of emissions to air can be determined by using emission factors […]);
    b. the characterisation of the risks associated with the process chemicals, based on the chemicals' hazard classification, pathways through the plant, potential release and level of exposure;
    c. the potential for recovery and reuse […];
    d. the regular (e.g. annual) analysis of the potential for substitution with the aim to identify potentially new available and safer alternatives to the use of (groups of) hazardous substances and substances of very high concern, such as PFAS, phthalates, brominated flame retardants, chromium-(VI)-containing substances; this may be achieved by changing process(es) or using other process chemicals with no or lower environmental impacts;
    e. the anticipatory analysis of regulatory changes related to hazardous substances and substances of very high concern, and safeguarding compliance with applicable legal requirements.

The computer based inventory of process chemicals may be used to provide and keep the information needed for the selection of process chemicals. This information should contain:

- the identity of the process chemicals;
- the quantities, location and perishability of the process chemicals procured, recovered […], stored, used and returned to suppliers;
- the composition and physico-chemical properties of process chemicals (e.g. solubility, vapour pressure, n-octanol/water partition coefficient), including properties with adverse effects on the environment and/or human health (e.g. ecotoxicity, bioeliminability/biodegradability).

Such information may be retrieved from Safety Data Sheets, Technical Data Sheets or other sources.

The criteria for selecting process chemicals and their suppliers may be based on certification schemes or standards. In that case, the compliance of the process chemicals and their suppliers with these schemes or standards is regularly verified.

2. Goals and action plans to avoid or reduce the use of and risks associated with hazardous substances and substances of very high concern.

3. Development and implementation of procedures for the procurement, handling, storage and use of process chemicals, disposal of waste containing process chemicals and return of unused process chemicals (see BAT 29 (d)), to prevent or reduce emissions to the environment.

Regarding handling and storage of process chemicals, BAT is to use all of the techniques given below:

a. techniques to reduce the likelihood and environmental impact of overflows and failures of process and storage tanks;
b. regular inspection and maintenance of plant and equipment,
c. optimised storage location of process chemicals,
d. dedicated area for unloading process chemicals containing hazardous substance,
e. segregated storage of process chemicals,
f. handling and storage of packaging containing process chemicals.

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The project “Chemicals Risk Management and Assessment of Alternatives: Tools and best practices to support circularity, create more sustainable products and avoid regrettable substitution” (LIFE FitForREACH2, No. 101113947 — LIFE22-ENV-EE-LIFE FitforREACH-2) is co-financed with the contribution of the LIFE Programme of the European Union.