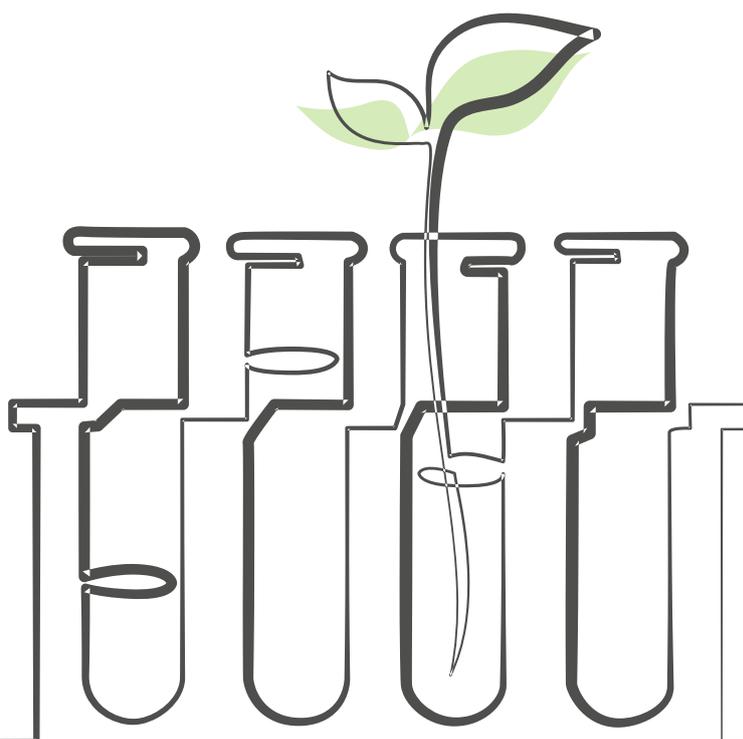


MANAGEMENT OF CHEMICALS AS A PART OF THE ENVIRONMENTAL MANAGEMENT SYSTEM

/ Guide /



About the Project

This guide was created as part of the project 'Capitalising key elements of NonHazCity: empowering private and professional users for better risk management and reduction in use of chemical products in their cities (NonHazCity2)'.

The project was a continuation of the project 'Innovative management solutions for minimising emissions of hazardous substances from urban areas in the Baltic Sea Region' implemented in the years 2016-2019.

Projects aimed to demonstrate possibilities to reduce emissions of hazardous substances to the Baltic Sea at the source. The main focus is on emissions from small scale emitters in urban areas e.g. private households, municipal entities, and businesses. Both projects were co-financed by the European Union's Interreg Baltic Sea Region Programme.

The stimulus for the implementation of these projects was the increasing presence of chemicals in our lives.

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VOCABULARY

Chemicals - substances and their mixtures.

Hazardous chemicals - chemicals that are a source of danger to the environment and/or to the wellbeing of humans¹.

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

Safety data sheet (SDS) - 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.

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 SVHCs:

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

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 deriving from the process used, but excluding any solvent which may be separated without affecting the stability of the substance or changing its composition².

Mixture – a mixture or solution composed of two or more substances².

Dangerous goods – those substances and articles of which the carriage is prohibited by ADR/RID, or authorised only under the conditions prescribed therein³.

Environmental management system (EMS) – according to the ISO 14001: 2015 'environmental management system' means 'part of the management system used to manage environmental aspects, fulfil compliance obligations and address risks and opportunities'.

More colloquially, 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

¹ There is no clear official definition in the CLP Regulation of the term hazardous, but 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 [...]'

² In accordance with the REACH Regulation.

³ In accordance with the ADR Agreement and RID Regulation

based on the requirements of the ISO 14001 standard or the corresponding Annex II to the EMAS Regulation.

Organisation – according to the ISO 14001: 2015 'a person or group of people that has its own functions with responsibilities, authorities and relationships to achieve its objectives'.

More colloquially, 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 having any legal standing. The key to recognising an entity as an organisation is its ability to take independent decisions enabling effective environmental management.

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

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.

INTRODUCTION

This guide introduces the management of chemicals concept to organisations implementing and maintaining environmental management system based on the ISO 14001 standard or EMAS Regulation in order to support their integration.

Management of chemicals means a systematic approach to the identification and assessment of used hazardous chemicals as well as decision making and implementation of actions to ensure they are used safely along their lifecycle and to prevent any potentially negative effects from these hazards.

The workflow for managing chemicals includes:

- inventory: compilation of information on all used substances and mixtures, including hazards, amounts, processes and product they are used in,
- compliance: comparison of the inventory with any applicable legislation related to chemicals; deriving action needs from potential non-compliance; in addition, implementation of routines to regularly check changes in chemicals legislation,
- assessment of the requirements of each potential action, including:
 - assessment of hazards and
 - assessment of exposures (where useful for decision making),
- risk management strategy: identification of possible options to adopt, collection of information, and assessment of options,
- decision making and implementation of necessary actions,
- checking of the results: monitoring and checking if the implemented actions eliminated or improved the situation,
- implementation of additional actions (if needed).

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This coincides with the approach of environmental management systems (EMS) based on the continual improvement cycle called PDCA cycle⁴, which involves:

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

The management of chemicals will be most effective if it is integrated into an overall management system. This enables comprehensive solving of problems related to the use of chemicals.

This guide is based on the belief that an EMS can be well applied to the management of chemicals and that linking the two concepts will create benefits for the organisation and the environment.

This guide is intended for chemical users, and not the manufacturers. For the purposes of this guide, it is assumed that the manufacturers of chemicals already have effective tools and procedures in place for management of chemicals. It would be too complicated to prepare a publication meeting the expectations of both the chemical industry and the end-users.

⁴ plan - do - check - act

Accordingly, the principles described in this guide are primarily applicable to organisations that use chemicals in their activities, in particular:

- industrial users, i.e. entities using chemicals as auxiliaries (e.g. users of coolants, cleaning agents, reagents) or to produce a mixture or an article in which the chemicals are incorporated,
- 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 administration.

From the point of view of the user of the guide, it is also important that it has been prepared for people working for organisations that:

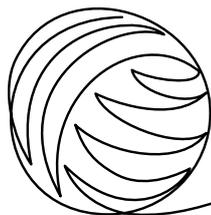
1. maintain an EMS (based on the requirements of the ISO 14001 standard or the EMAS Regulation), but so far have had little coverage of management of chemicals,

as well as those that:

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

The guide may also be used by auditors acting on behalf of certification bodies (including EMAS verifiers) who seek knowledge of good practices applied in various areas related to environmental management.

Occupational health and safety risks that are covered by other standards⁵ are not covered in this document.

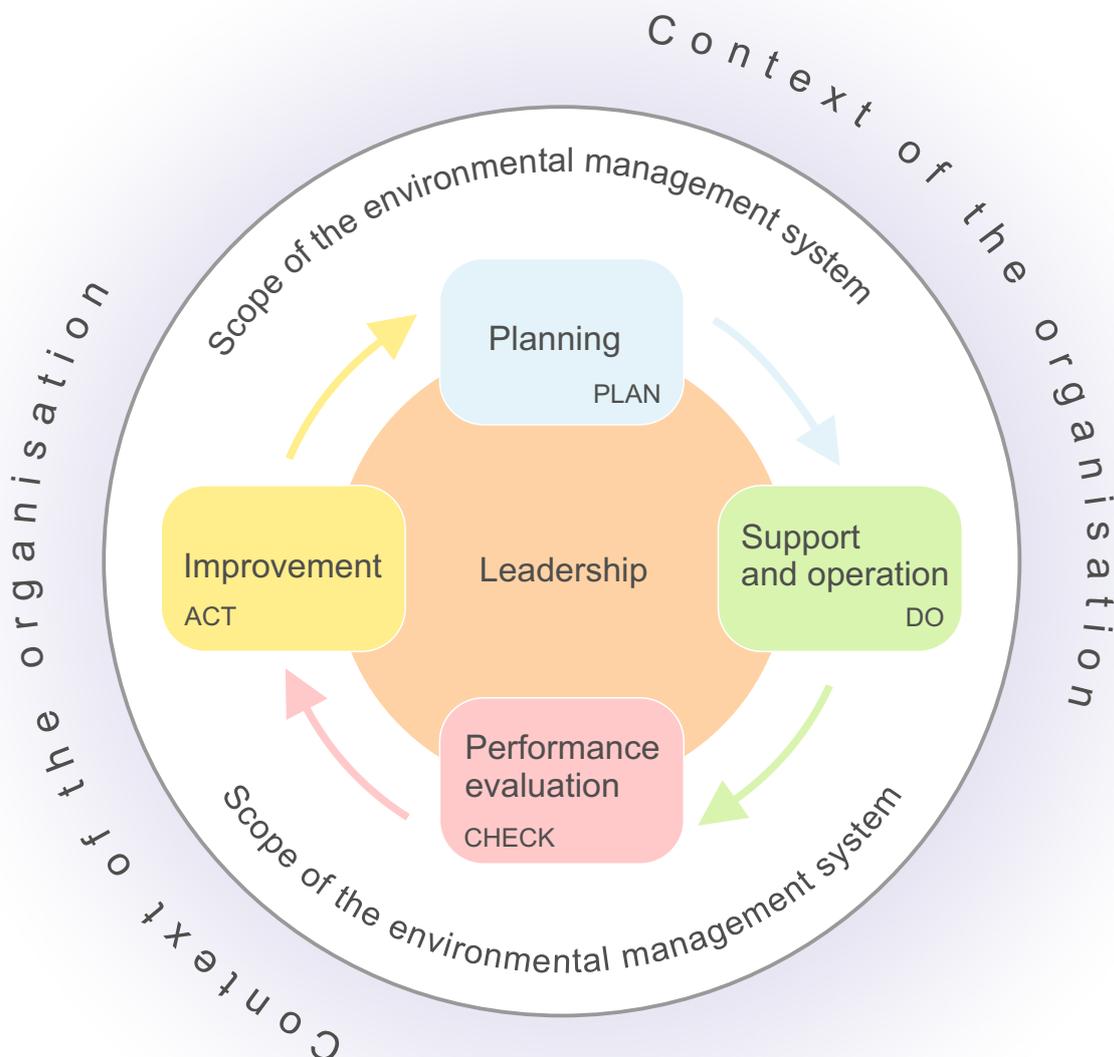


⁵Issues related to the management of occupational safety are dealt with, among others, standard ISO 45001: 2018-06 Occupational health and safety management systems - Requirements and guidelines for use

GUIDANCE ON INCORPORATING MANAGEMENT OF CHEMICALS IN AN ENVIRONMENTAL MANAGEMENT SYSTEM - OVERVIEW OF THE REQUIREMENTS OF THE ISO 14001 STANDARD

In this chapter all the requirements of the ISO 14001 standard are discussed in order of the standard's structure. For each of them, the elements related to the management of chemicals are indicated.

The structure of the standard requirements is presented on the figure below.



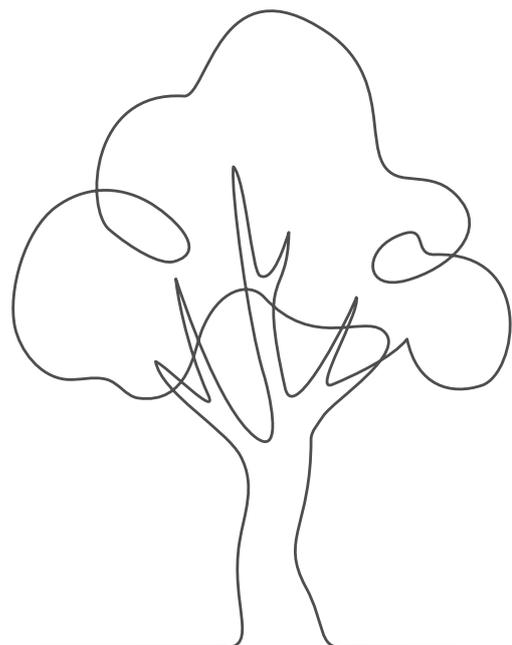
The colours used for the EMS elements in the figure were also used on the following pages to indicate the corresponding parts of the guide.

It should be noted, however, that the structure of the requirements of the ISO 14001 standard does not correspond to the typical flow of the EMS implementation process. Before starting the process, it is advisable to conduct an initial analysis, often referred to as an initial review. The initial review is not directly referenced in the ISO 14001 standard, the way it is carried out may influence the rest of the EMS



More information on initial review is provided in Appendix 1.

It should be noted that the basis for all other elements of the management system based on the ISO 14001 standard are 'significant environmental aspects'. Therefore, if significant environmental aspects determined by the organisation are related to hazardous chemicals the system should address them automatically. Further pages of this guide provide explanations and examples related to the above.



Context of the organisation (4)

Understanding the organisation and its context (4.1)

The ISO 14001 standard requires organisations to determine the context in which they operate. While doing so, organisations shall consider internal and external factors influencing the purpose of the organisation's existence and in particular the intended outcomes of implementing and maintaining an EMS.

Understanding the context is the basis for determining the threats and opportunities for the organisation and to further include them in the EMS.

The purpose of this requirement of the standard is to make those accountable within the organisation aware of the relationship between the environment and activities it carries out. These relationships are usually stronger than expected. Being aware of these relationships helps to avoid mistakes that could result in unforeseen costs, loss of good image or a decrease in sales. To meet this requirement, it is useful to clearly determine the reasons why the organisation decided to implement and maintain an EMS. The standard indicates that the context should be determined by identifying both external and internal factors related to environmental aspects and influencing the purpose of the organisation's existence.

Determining external and internal factors 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 clause 9.3).

In relation to the management of chemicals, the external factors can include for example:

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

Some of the external factors are related to the needs and expectations of the external interested parties, which will be presented in the next clause.



Information on changes in the law can be found:

- in the register of substances for which they are planned to be classified as substances of very high concern (so-called SVHC substances) - this register contains information about the substances with plans to submit documentation, with a view to being recognised as a SVHC; the register is available on the website of the European Chemicals Agency:
[🔗 https://echa.europa.eu/en/registry-of-svhc-intentions/](https://echa.europa.eu/en/registry-of-svhc-intentions/)
- in the register of intentions to change the classification and labelling - the register contains proposals for new or updates of the existing harmonised classification and labelling of substances; the register is available on the website of the European Chemicals Agency:
[🔗 https://echa.europa.eu/en/registry-of-clh-intentions-until-outcome/](https://echa.europa.eu/en/registry-of-clh-intentions-until-outcome/)
- on the list of substances proposed as POPs⁶ - which lists and provides information on all chemicals proposed for the potential inclusion in the Stockholm Convention:
[🔗 https://echa.europa.eu/pl/list-of-substances-proposed-as-pops](https://echa.europa.eu/pl/list-of-substances-proposed-as-pops)

Internal factors can be:

- conditions related to technologies used, including related limitations e.g. no possibility to change the chemicals used without significant changes in the equipment,
- local conditions (including limitations) related to the characteristics of the buildings and the location (e.g. no possibility of installation on larger tanks),
- 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.),
- awareness and competences of the staff handling chemicals.

Understanding the needs and expectations of interested parties (4.2)

Some of the external and internal factors referred to in clause 4.1 of the ISO 14001 standard 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. The ISO 14001 standard requires organisations to identify these stakeholders, understand their needs and expectations, and then decide which of these needs and expectations to implement.

Stakeholders' articulation of their needs and expectations does not automatically imply that the organisation that maintains the EMS is committed to meeting them.

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

⁶ POPs - persistent 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.

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

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

Determining the scope of the environmental management system (4.3)

The ISO 14001 standard requires organisations to define the physical and functional boundaries within which its EMS operates.

When deciding on the scope of an EMS, several factors should be considered, such as:

- the context of the organisation, the expectations and needs of interested parties (see clauses 4.1 and 4.2),
- the organisational structure and geographic locations in which the organisation operates,
- the ability to control and influence elements of the supply chain throughout the life cycle of products or services.

The purpose of this standard 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 management of chemicals, the EMS scope can cover the organisation's main processes e.g. production, design, logistics, supervision over subcontractors and even waste generated in connection with the operation and end of life of the product. It should be emphasised that the 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 the management of chemicals, which often requires influencing suppliers and considering long-term impacts on consumers. Obviously the behaviour of suppliers in many cases can hardly be influenced but a change of supplier is possible. Contractors can be selected based on their chemical performance. Including the products into the EMS scope is essential, as the impact on the consumers and the environment from chemicals is in most cases related to the products rather than to the emissions from the installation which 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 of own activities from the scope of the EMS shall be transparently documented and communicated to stakeholders.

Issues to consider (examples):

- if all significant issues related to management of chemicals or any area of activity where chemicals are used, are included in the scope of the EMS,
- whether it is appropriate to extend the scope of the EMS to those 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 used within their own processes,
- whether it is appropriate to extend the scope of the EMS to those 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 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.

Environmental management system (4.4)

The ISO 14001 standard requires organisations maintaining an EMS to consider the context of the organisation, including the needs and expectations of interested parties (see clauses 4.1 and 4.2).

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

Issue to consider:

- how should the organisation incorporate the existing EMS (including management of chemicals) into its business processes, e.g. in designing, planning and executing purchases, human resource management, sales, promotion, and marketing etc.



Leadership (5)

Leadership and commitment (5.1)

The ISO 14001 standard requires the top management of organisations to accept the responsibility for the effectiveness of the EMS and demonstrate leadership and commitment to its operation.

The attitude of the management shall include the provision of resources, communicating the importance of an effective EMS for the organisation and achieving its strategic objectives.

Top management may delegate some of its responsibilities to others but shall 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 the EMS effectiveness depends to a large extent on the commitment of the management, including the top management. The level of commitment by the top management to exercise leadership translates into the involvement of other employees within the organisation. This is applicable to all areas of the organisation, including the management of chemicals.

Examples of the top management involvement in management of chemicals issues include:

- conducting or initiating activities related to the identification of risks for the organisation resulting from the use of chemicals in both the organisation's and contractor's activities,
- including issues related to the management of chemicals in the organisation's strategies,
- communicating both inside and outside the organisation the importance of the management of chemicals to maintain or improve the market position of the organisation,
- providing resources for the effective management of chemicals,
- encouraging and motivating employees to seek and implement good practices in the field of management of chemicals,
- initiating cooperation in the supply chain aimed at reducing the negative effects of the use of chemicals,
- considering joining voluntary initiatives on chemical risk, e.g. the Responsible Care programme (for the chemical industry).

These issues may be partly or wholly delegated to other employees. In some cases the appointed person for the management of chemicals may be appointed. It should be noted however, that regardless delegating these tasks the accountability remains with the top management.

Environmental policy (5.2)

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. The ISO 14001 standard requires the environmental policy to include at least obligations to:

- continual improvement of the environmental management system in order to reduce the negative or strengthen the positive environmental impacts of the organisation,
- meeting external requirements resulting from legal regulations or other sources (including those resulting from certain expectations of interested parties),
- environmental protection, including pollution prevention,
- other activities resulting from the context of the organisation.

The purpose of this requirement is to ensure that the organisation's top management communicates to interested parties its approach and aspirations with regard to the environment. 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, environmental policy is a declaration of will and specific obligations in the field of environmental protection.

Although it is not a direct requirement of the standard, it is worth making the environmental policy publicly available, e.g. on the organisation's website.

The policy shall be documented and available to stakeholders.

With regard to the management of chemicals, the main and overarching goal to be included in the environmental policy should be the minimisation or at least continual reduction of negative impacts from the use of chemicals. This can be further specific, e.g. :

- minimizing the use of hazardous chemicals (e.g. SVHC) in own processes,
- limiting or eliminating the content of hazardous chemicals in products,
- substituting or eliminating hazardous chemicals in products and services offered by the organisation,
- increasing transparency on the use of chemicals in products, production and auxiliary processes.



Organisational roles, responsibilities, and authorities (5.3)

The ISO 14001 standard requires that the top management of the organisation assigns the appropriate persons roles, responsibilities and authorities related to the environment. This shall apply to various levels in the organisational structure - from top management to operational positions.

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 organisation's environmental management performance. 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 management of chemicals, it is important that the responsibility for chemicals is either clear in the job role of the dedicated environmental manager or, in specific cases, defined as a self-standing responsibility for management of chemicals in the organisation. It is essential that anyone having tasks related to chemicals, including e.g. designers or purchasers, know and understand their responsibilities in this regard. They shall also be aware of the risks associated with the use of specific chemicals (see clauses 7.2 and 7.3). It is also important that everyone in the organisation knows who is responsible for the management of chemicals.

In some countries, employing a chemical safety specialist may be an obligation resulting from legal requirements, e.g. a dangerous goods advisor in organisations involved in the transport of dangerous goods by road or rail⁷. The tasks of a dangerous goods advisor do not necessarily correspond to or cover all of the management of chemicals tasks within the company.

Issues to consider (examples):

- appointing a chemicals manager i.e. a person responsible for the area of management of chemicals. In most cases this would be an additional competence area for the existing managerial position,
- creating a list of people on whom the proper management of chemicals depends in all areas of the organisation's operation (design, procurement, technological processes, maintenance, storage, transport, etc.),
- assigning these people additional duties, responsibilities and authorities, for example, the organisation may add additional responsibilities and authorities in the area of procurement of hazardous chemicals to one of the people working in the procurement department.

⁷ The obligation to employ an advisor for the transport 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.

Planning (6)

NOTE: In the ISO 14001 standard, planning is based on the risk determination. The standard defines separately the term 'risk' and the phrase 'risks and opportunities'. '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, in this guide (except where this is due to the fact that a 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 needs to be underlined that the term 'risks and opportunities' in the ISO 14001 standard is related to the effect on organisations, not on the environment as such.

Actions to address risks and opportunities - General (6.1.1)

The ISO 14001 standard requires organisations to identify threats and opportunities related to the environmental impacts as a result of the organisation, or impacts on the organisation as a result of the environment that are significant for:

- intended outcomes of implementing and maintaining an EMS,
- the purpose the organisation has been established for,
- continual improvement of the EMS, including enhancement of environmental performance.

The determination of threats and opportunities is essential to planning environmental activities.

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 threats and opportunities may include:

- identified environmental aspects (e.g. potential emergency situations related to the use of hazardous chemicals) - see clause 6.1.2,
- legal requirements - see clause 6.1.3,
- expectations of stakeholders (including customers, product users, and service users of the organisation) - see clause 4.2.

In practice, therefore, the sequence of actions is such that, before determining threats and opportunities organisations:

1. identify and evaluate the environmental aspects of their activities,
2. determine applicable legal requirements as well as needs and expectations of interested parties regarding the identified environmental aspects.

It is worth reminding that the term 'threats and opportunities' is related to the organisation as such and not directly to the environment.

The process of determining threats and opportunities including its outcomes shall be documented.

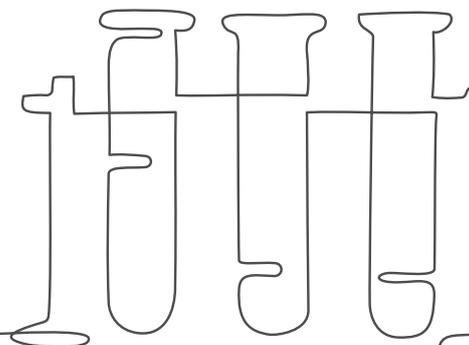
Failure in management of chemicals may cause adverse impact on the environment. This may contribute to possible claims or legal sanctions against the organisation, which are to be considered a threat. The growing environmental awareness of customers and the related increase in demand for the products or services which, to a lesser extent, negatively affect the environment can be considered as an opportunity for organisations that are able to satisfy this demand.

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

- decline in sales resulting from customer concerns related to the use of hazardous chemicals or their presence in the products,
- legal ban or use restrictions regarding certain chemicals and the related difficulties and costs of substitution or other compliance assurance measures,
- the possible costs of compensations related to the adverse effects of certain chemicals on people living in the vicinity, the users of the products (consumers, workers) or the environment⁸ – in normal conditions or in an emergency situation,
- deterioration of the image of the organisation and its products as a result of e.g. unwanted substances in product or chemical accidents,
- loss of clients as a result of disseminating information about the negative impact of components used in production by the organisation.

In turn, the opportunities for the organisation may be:

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



⁸ 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.

Environmental aspects (6.1.2)

The environmental aspect according to the ISO 14001 standard is 'element of an organisation's activities or products or services that interacts or can interact with the environment'.

The ISO 14001 standard requires organisations to:

- identify the environmental aspects of their activities, products, and services that they can control or influence,
- determine environmental impacts related to the environmental aspects,
- establish criteria for significance evaluation of environmental aspects,
- indicate those environmental aspects that are considered significant, i.e. evaluate aspects according to the adopted criteria.

When determining environmental aspects and related environmental impacts, the organisation shall consider:

- planned projects and anticipated changes in their activities, products, and services,
- expected unusual conditions, including emergency situations,
- life cycle perspective, i.e. environmental impacts related to sourcing of raw materials, production of parts/elements by suppliers, delivery, transport, distribution of products, use of products, processing of products after their end of life, and disposal of related waste.

According to the ISO 14001 standard:

- a significant environmental aspect is one that has or can have one or more significant environmental effects,
- significant environmental aspects are determined by organisations using one or more criteria.

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 threats and opportunities (clause 6.1.1), setting environmental objectives (clause 6.2), operational activities (clause 8.1), emergency preparedness and response (clause 8.2), and monitoring and measurements (clause 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 use of hazardous chemicals itself - in every phase of the product life cycle,
2. the release of chemicals (or, in fact, their components) to specified elements of the environment (e.g. air, surface water, soil, etc.):
 - under normal conditions, i.e. during production processes / service provision,
 - at every stage of the product life cycle, e.g. during its operation,
 - in the event of an emergency.

The first option facilitates the management of chemicals on the purchasing, storage, and process side. The second, on the other hand, helps to determine significant environmental impacts and link them to the chemicals used. The organisation may consider that a combination of the options outlined above is the optimal solution.

In both options, the identification and evaluation of the environmental aspects related to chemicals require a complete inventory of all purchased chemicals, their storage, use, and release to the environment.

 Environmental aspects may be identified by carrying out the initial review, described in more detail in Appendix 1.

NOTE: The basis for identifying and evaluating the environmental aspects of chemicals is the inventory of the chemicals used. The level of detail and up-to-date information contained, and its accessibility to those involved in the management of chemicals, is critical to the effectiveness of the management system in this area. It can 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.

 More information on the chemicals inventory can be found in Appendix 8.

Environmental aspects evaluation

The definition of an environmental aspect in the ISO 14001 standard indicates that the basic criterion for evaluating environmental aspects is the scale of the related environmental impact. For chemicals, the impact can be evaluated on the basis of:

- their hazardous properties regarding human health and the environment
- and
- the level of environmental and human exposure to the chemicals.



Once again, the necessity to consider the life cycle perspective needs to be emphasised. This means that with regard to chemicals, the environmental aspects evaluation should address also threats related to:

- potential adverse impacts on a consumer's health caused by using the products and services provided by the organisation, e.g. threats that depend on the way chemicals are released during the use of the product,
- potential exposures and resulting damage to the environment from all life cycle stages, e.g. threats related to used products, threats caused indirectly, i.e. by polluting elements of the environment (e.g. water, soil, air, flora, fauna), which further affect consumer products (e.g. food products), damages in the event of an accident that give rise to uncontrolled releases of chemicals into the environment.

The parameters used in the risk assessment of chemicals are, among other things, the hazardous properties of chemicals. Hazards related to chemicals can be grouped in the following way:

- hazards related to their physical properties, e.g. explosiveness, flammability, metal corrosion ability,
- human health hazards, e.g.: toxicity, skin corrosion / irritation, respiratory sensitisation, germ cell mutagenicity,
- environmental hazards, e.g. aquatic toxicity, bioaccumulation potential.

Information about chemical hazards is provided, among others, in the safety data sheets, which in many countries are compulsorily supplied with the chemicals. Special attention should be taken with regards to the chemicals that contain substances that are subject to authorisation and restrictions, and to which special provisions apply.

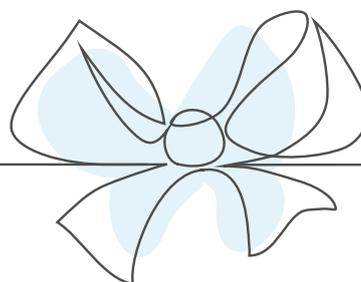


More information on such substances is provided in Appendix 2.

The level of exposure depends on factors such as the amount of chemicals stored in a given location, and the way in which they are stored, handled and used. For some chemicals there are indications of what amount could give rise to a higher level of exposure. The sources of information in this case 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 regards to:

- specific categories and hazards posed by substances,
- specific substances.

The information presented above may serve as an inspiration to adopt 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 of the organisation.



Compliance obligations (6.1.3)

The ISO 14001 standard requires organisations to define:

- requirements resulting from applicable law,
- requirements from other sources adopted for use by the organisation due to the non-legal reasons.

The organisation shall have access to these requirements, understand how to comply with them, and maintain relevant documented information.

The purpose of this requirement is to ensure that the organisation is aware of all compliance obligations, namely:

- legal requirements relating to the environment, applicable to its activities,
- requirements from other sources (non-legal requirements).

Being aware of these requirements is one of the conditions for ensuring compliance. It should be emphasised that the term 'legal requirement' should in no way be associated with the term 'legal act'. Hence, the register of legal requirements, which is an obligatory element of documented information according to the ISO 14001 standard, does not mean a list of legal acts titles, but rather specific obligations (including limitations and bans) deriving from these legal acts.

The sources of legal requirements can be:

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

 More information on EUCLEF can be found in Appendix 3.

Legal requirements for chemicals can take the form of:

- bans for placing on the market,
- specific use restrictions,
- conditions for placing on the market.

 Examples of forms of legal requirements for chemicals are provided in Appendix 4.

Indirectly, issues related to management of chemicals 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 the maximum permissible concentrations of harmful factors in the work environment.

 A non-exhaustive list of legal acts which are the source of legal requirements is provided in Appendix 5.

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

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

The eco-labelling (eco-labels) – placing information on the products, showing that the product meets the accepted criteria, related to environmental protection. Existing eco-labelling systems are designed such that the right to use Eco-label is granted to products, where a strictly defined group of products are evaluated as less environmentally harmful than others having a similar function.

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. One criteria may be, for example, not using certain chemicals in the production.

EU eco-label 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.



The 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:

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

Planning action (6.1.4)

The ISO 14001 standard requires organisations to plan actions addressing identified:

- significant environmental aspects,
- compliance obligations,
- threats and opportunities.

The planned actions shall be further incorporated into the EMS.

The purpose of this requirement is to provide a logical framework for the EMS. In practice it means that further actions planned within EMS address the most important issues identified in the planning phase.

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

- environmental objectives (clause 6.2),
- supporting elements:
 - resources (clause 7.1),
 - competence (clause 7.2),
 - awareness (clause 7.3),
 - communication (clause 7.4),
 - documented information (clause 7.5),
- operational planning and control (clause 8.1),
- emergency preparedness and response (clause 8.2),
- monitoring, measurement, analysis, and evaluation (clause 9.1).

This clause of the ISO 14001 standard is the basis for the statement that by:

- identifying the use of chemicals as a significant environmental aspect(s),
- taking into account relevant legal, and other, requirements, and
- determining threats and opportunities related to chemicals

an EMS can provide a proper management of chemicals.

Environmental objectives and planning to achieve them (6.2)

The ISO 14001 standard 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.

Environmental objectives shall result from the adopted environmental policy and should be formulated in a way that allows for unambiguous determination of the degree of their implementation.

The ISO 14001 standard requires that the degree of achieving environmental objectives is monitored, updated, and communicated.

The standard requires organisations to consider:

- environmental aspects it considers significant,
- legal and other environmental requirements (including the needs and expectations of stakeholders),
- identified risks (threats and opportunities).

Determining environmental objectives is the realisation of a policy commitment to continual improvement, including enhancement of environmental improvement. Establishing a plan to achieve them is necessary for ensuring the provision of resources for an EMS (see clause 7.1).

Environmental objectives shall be documented.

In relation to the management of chemicals the organisation should, considering the identified risks and opportunities, decide for which chemicals environmental objectives should be adopted. When setting environmental objectives for chemicals, a management of chemicals hierarchy can be used:

- elimination of the use of hazardous chemicals,
- reducing the use of hazardous chemicals,
- substituting more hazardous chemicals with less hazardous ones.

 Examples of environmental objectives for chemicals, together with a description of the situation that necessitate their adoption, are provided in Appendix 6.

Support (7)

Resources (7.1)

The ISO 14001 standard 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:

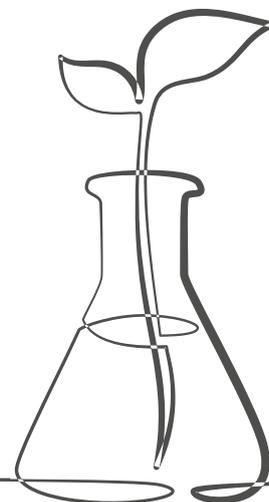
- people - employees responsible for the functioning of the EMS,
- time,
- access to technology.

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 clause 5.1) to an operational level.

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

- the time necessary to obtain information on chemicals, or technical solutions available on the market, the implementation of which could contribute to the reduction of negative environmental impacts,
- technology that allows reducing the use of chemicals,
- financial resources for the appropriate equipment of chemical storage sites.

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



Competence and awareness (7.2 and 7.3)

In addition to the general requirements concerning resources (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 competences turn to be insufficient, the organisation shall take measures to ensure an appropriate level of competence.

The organisation shall also ensure that those working under the organisation's control are aware of:

- the organisation's environmental policy,
- significant environmental aspects related to their work and their actual or potential environmental impacts,
- the benefits of reducing negative environmental impacts,
- 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 the negative impact on the environment.

Evidence of competence shall be documented.

With regard to management of chemicals, the requirements above may refer to employees involved in the procurement, storage, and use of chemicals. From a lifecycle perspective, it may be important to ensure that those involved in product or service design, sales, and marketing have the appropriate competences. It is worth noting that in some situations obtaining appropriate competences is a requirement resulting from legal provisions, e.g. an advisor for the transport of dangerous goods in organisations involved in road or rail transport of dangerous goods, or crews of vehicles transporting dangerous goods needs specific qualifications⁹. The requirement to ensure appropriate competences also applies to other employees involved in the transport of dangerous goods. These competences should be confirmed by training in the requirements related to such transport, in accordance with the responsibility and obligations of these persons.

A supplement to ensuring the competences of selected employees is ensuring the awareness of all employees (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 more appropriate manner. An important way to implement this requirement can be training on the management of chemicals and the risks resulting from the use of chemicals. Another way might be to develop agreed procedures (e.g. in the form of documented action plans, procedures, or instructions) on how to deal with the chemicals used and how to deal with possible emergencies. Such knowledge will result in more prudent and careful handling of chemicals. The awareness of the dangers of the chemicals used allows you to make optimal decisions without errors.

 Information on the properties of chemicals, the hazards they pose and the methods of handling them can be found in the SDSs referred to in Appendix 7.

The purpose of this requirement is to ensure the smooth flow of information at the level necessary for

⁹ The obligation to obtain the appropriate competences by an advisor for the transport of dangerous goods or crews of vehicles transporting dangerous goods is derived from the ADR Agreement in the case of road transport of dangerous goods and the RID Regulation in the case of rail transport.

Communication (7.4)

The ISO 14001 standard requires organisations to communicate with internal and external interested parties (stakeholders) in the area of the environmental management.

Communication shall be conducted in an orderly manner, i.e. the organisation shall determine what, when, to whom, and how it communicates. Communication within the organisation should include efficient and multi-directional flow of information between the relevant positions and levels in the organisational structure.

External communication shall include informing stakeholders about environmental issues and ensure the receipt of information (e.g. complaints) from them. The standard also applies to communication resulting from legal and other environmental requirements.

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 under the influence of the organisation (e.g. customers or neighbours of the organisation).

Evidence of communication shall be documented.

In the case of chemicals, the external communication shall include at least:

- receiving and responding to information requests, substitution ideas and complaints from external stakeholders,
- distribution of the necessary information about their properties and risks reduction measures to be implemented.

It is essential that communication is carried out not only down the supply chain (supplier to user) but also upstream (user to supplier).

The information provided by the supplier relates primarily to properties of chemicals, their uses, and conditions of safe use. The effectiveness of communication largely depends on the quality of the data transmitted. The users of chemicals in certain cases should communicate with supplier information on how the chemicals are used, especially if they differ from those intended by the supplier.

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

- labelling of hazardous chemicals,
- SDSs,
- documentation attached to products - e.g. information on 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 on labelling of hazardous chemicals and SDSs is provided in Appendix 7.

Internal communication should include the provision of information on the properties of chemicals

and safe conditions for their storage and use. The sources of information on the properties of chemicals are packaging labelling and SDSs. SDSs are also a source of information on:

- proper handling and storage of chemicals - section 7 of SDS,
- 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,
- waste disposal - section 10 of SDS,
- transport - section 14 of SDS.

The information contained in the SDS should be used to develop documents, for example, documents such as instructions for using chemicals, or instructions for their storage and transport. The purpose of this requirement is to ensure that the documents produced in connection with the

Documented information (7.5)

Although the ISO 14001 standard requires organisations to keep certain documented information, which are indicated in the ISO 14001 standard, the organisation is also required to keep additional documented information, based on their own needs. Documented information shall be updated and reviewed to ensure that it is a useful and easy-to-use element that improves the effectiveness of the EMS.

functioning of the EMS improves operations and does not constitute an additional bureaucratic burden on the organisation.

Regarding the management of chemicals, the need for documentation may arise from legal requirements or as a result of communicated needs from internal and external stakeholders.

Examples of documented information:

- inventory of hazardous chemicals used,
- SDS for hazardous chemicals,
- documents describing the agreed procedure for chemicals (e.g. instructions for ordering, storing, transporting, using, etc.),
- a list of persons authorised to perform specific activities related to the chemicals,
- instructions for the use of products that may emit chemicals,
- specifications for subcontractors and outsourced processes regarding the hazardous chemicals used.



More information on inventory of hazardous chemicals is provided in Appendix 8.

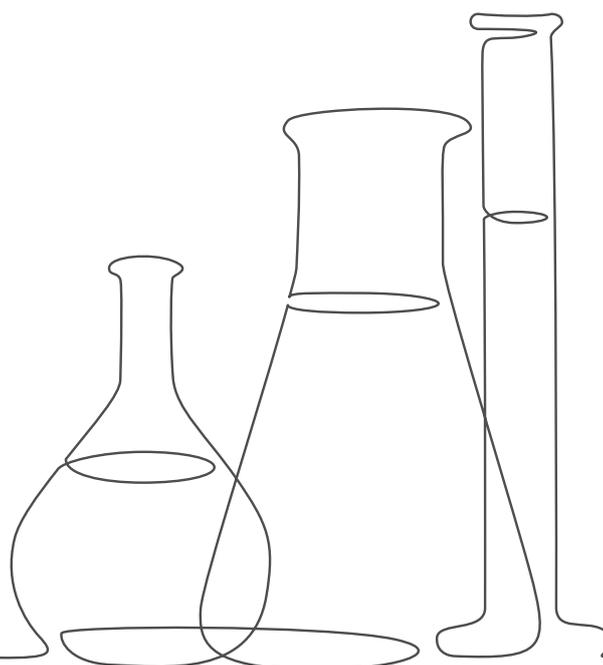
Examples of documented information required by law include:

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

Supervision over documented information shall primarily include ensuring that documented

information is kept up to date. This is important, for example, when the list of chemicals used includes the quantities available or if the chemicals being used are changed. 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.

The way in which the EMS documentation is reviewed, in particular the management of chemicals documents, should be consistent with the way other documents in the organisation are reviewed.



Operation (8)

Operational planning and control (8.1)

According to the ISO 14001 standard, an organisation shall not allow its impact on the environment to exceed 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:

- 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.
- the adoption of operational criteria, i.e. specific parameters that shall be achieved in order for the process or operation to be considered as having no greater environmental impacts than necessary.

An important requirement of the ISO 14001 standard 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 not greater than necessary. Operational planning and control make it possible to transfer the results of the environmental aspects evaluation and determination of threats and opportunities to an operational level within the organisation.

Regarding the management of chemicals, the established modes of conduct shall apply to different business areas, e.g.:

- designing processes and products, considering the minimisation / elimination of the use of chemicals,
- determining the demand for chemicals (eliminating oversupplies),
- ordering method, e.g. centralisation and optimisation of purchases, elimination of uncontrolled purchases,
- logistics (if applicable),
- storage methods, e.g. physical conditions (humidity, temperature, ventilation, etc.), maximum quantities, avoidance of expiry (first in / first out), labelling of packages,
- methods of chemical waste management.

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 a product or service life. This may include specific requirements for:

- chemical suppliers (e.g. source of origin, method of delivery, type of packaging, collection of packaging),
- chemicals characteristics (e.g. performance criteria, excluding certain hazardous substances),
- the way the product is used by the user (including the way of storing or managing waste resulting from the use of the product),
- 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. do 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 clause 7.3.

Established modes of conduct and operational criteria may originate from legal or other environmental requirements (see 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 clause 5.3).

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

Some sources for operational criteria for the management of chemicals can be legal requirements, or either physical or chemical properties of the chemicals.

 More information on sources for operational criteria is provided in Appendix 9.

Supervision over actions and operations can be carried out by technical means retaining the desired parameters, for example 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 on techniques related to the use of chemicals is provided in Appendix 10.

Emergency preparedness and response (8.2)

The ISO 14001 standard requires organisations to:

- prevent emergency situations,
- prepare for their occurrence.

This means preparing scenarios of conduct (usually in the form of procedures or instructions) in the event of emergency situations. These scenarios shall aim at eliminating or minimising the negative effects of emergency situations on the environment.

The standard requires the organisation to periodically test the adopted scenarios 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 an emergency situation, and if it cannot be avoided, to minimise its effects on the environment by preparing scenarios.

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

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

- fire,
- leakage,
- explosion.

When establishing emergency scenarios, professional methods of risk analysis and safety assurance may be useful, e.g. event tree analysis, cause-and-effect analysis, hazard and operational capability analysis (HazOp), a method of analysing an operating error, its effects and further consequences. Some of the professional methods of risk analysis are intended for industrial plants with a potential risk of a major accident. In other cases, a method that can be used is to subject all areas of the organisation's activities to a simplified risk analysis. In the case of chemicals, these will certainly be the areas of application and storage of chemicals.

A simplified risk analysis can be performed by asking the question: 'What will happen if ...?' and relating it to all possible, even very unlikely, situations, e.g.:

- What will happen if a chemical tank, at a given location, breaks and the contents leaks from the tank?
- What happens if a fire breaks out in a chemical warehouse? What happens when all the contents of this clip burn out? What will happen when the ignited warehouse is extinguished?
- What happens if there is a flood?

For each of the identified emergency situations that may adversely affect the environment or humans, a response plan needs to be prepared and people who could be involved in rescue or evacuation need to be familiar with it.

When developing plans to respond to emergencies related to chemicals, information on the measures in case of fire (section 5 of SDS) and environmental precautions (section 6 of SDS) should be considered. Information on chemical stability (section 10.2 SDS), the possibility of hazardous reactions e.g. the excessive generation of heat (section 10.3 SDS) and the hazardous decomposition of products (section 10.6 SDS) may be useful as well.

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

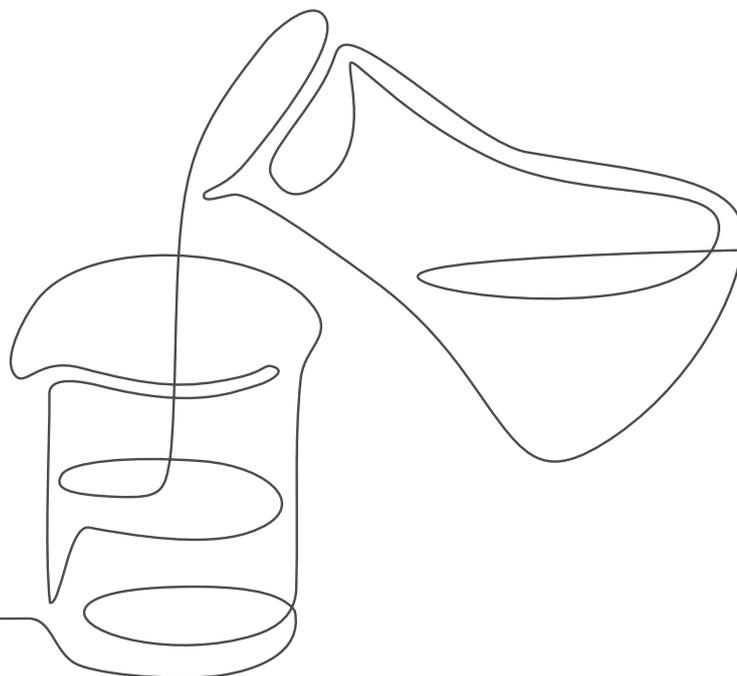
Additionally, it is also worth noting that identified emergency situations may apply to another phase of the life cycle of the product, than the one that is subject to full control of the organisation holding the EMS. In such a case the good practice is to prepare data for the organisation overseeing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

An important element in the preparation for emergency situations is the use of preventive measures. Typical preventive measures related to the use of chemicals is the installation, operation, and supervision of the appropriate functioning of:

- devices measuring:
 - concentrations of specific chemicals
 - fill level of tanks,
 - flow rate,
 - temperature,
 - pressure,and sending warnings and / or alarm signals,
- safety valves,
- double-walled tanks,
- trays to protect against the effects of spills, etc.

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

Emergency procedures may also include the transport 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) will apply.



Performance evaluation (9)

Monitoring, measurement, analysis, and evaluation (9.1)

The ISO 14001 standard requires organisations to monitor and measure the environmental effects of their activities as well as analyse and evaluate the results of the monitoring and measurements. This process includes determining:

- parameters to be monitored and measured,
- methods of their conduct,
- the indicators used and the criteria for evaluating the results,
- schedule of monitoring and measurements,
- modes of conduct analyses, and assessment results of monitoring and measurement.

An important part of the criteria for assessing the results of monitoring and measurement shall be compliance obligations, including the needs and expectations of stakeholders. The ISO 14001 standard requires that an organisation provides supervision of measuring equipment used, if this may 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.:

- compliance with legal and other environmental requirements,
- meeting own operational criteria,
- the level of achievement of environmental objectives,
- the level of improvement in environmental performance.

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

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

- a. technical parameters, e.g.:
 - the amount of hazardous chemicals used for particular purposes,
 - physical conditions related to storage (temperature, humidity),
 - concentration of substances in mixtures and solutions,
 - hazardous substance content in a product,
 - fill level of tanks,
 - flow rate.
- b. organisational issues, e.g.:
 - implemented emission and exposure reduction measures, regarding chemicals, 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.

Internal audit (9.2)

The ISO 14001 standard requires organisations to plan and conduct internal audits to assess whether the EMS operates in accordance with:

- the requirements established by the organisation as part of the EMS,
- the requirements of the standard.

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 the management with information on the verification results.

Information regarding planning and carrying out of internal audits shall be documented.

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

- physical inspections in places / facilities where chemicals, and stored chemical waste, are used / stored in order to verify the application of the established procedures (including those preventing accidents),
- analysis of data relating to:
 - quantities of supplied / stored / consumed chemicals,
 - the amount of chemical waste,
 - mass balances for individual processes / products,
- interviews with the personnel responsible for managing chemicals.

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

Carrying out periodic (e.g. weekly/monthly) inspections aiming at, e.g. assessing the state of emergency protection and identification of new potential sources of chemical safety hazards that might increase the risk of accidents, may be a valuable part of the internal audit process.



Management review (9.3)

The ISO 14001 standard requires organisations' top management to periodically evaluate the suitability, adequacy, and effectiveness of the EMS. As part of the management review, management assesses changes in:

- the context of the organisation, including the needs and expectations of interested parties (see clauses 4.1 and 4.2),
- environmental aspects and the result of their evaluation,
- threats and opportunities for the organisation.

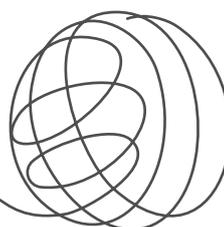
It also assesses environmental performance and opportunities for improvement.

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 the directions for changes to improve this effectiveness.

Management review, including its outputs, shall be documented.

With regard to management of chemicals, an important component of the analysis taken, within the management review, by top management may include, for example:

- feasibility of implementing new or modified chemicals into processes or products, which would reduce the negative environmental impacts on the environment and humans,
- priority setting with regard to improvement activities in the companies – do the priorities correspond to the company policy and address the most relevant impacts?
- cost-benefit analysis of the implemented/planned measures,
- results of external studies on the impact of the chemicals used on the environment and humans (at different stages of the life cycle),
- comparison with competitors and sector standards,
- consideration of scientific developments and policy discussion – does the company follow the trends and/or contradict the state of the art?
- feedback from contractors regarding complaints from consumers,
- information on changes in the law, e.g. likely ban of chemicals used by the organisation.



Improvement (10)

General and continual improvement (10.1 and 10.3)

The ISO 14001 standard 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.

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 the case they have been identified as environmental aspects of an organisation.

Nonconformity and corrective action (10.2)

In addition to clauses 10.1 and 10.3 of the ISO 14001 standard, the clause 10.2 requires organisations to establish a process of planning and implementing corrective actions with regard to any identified non-conformities, including:

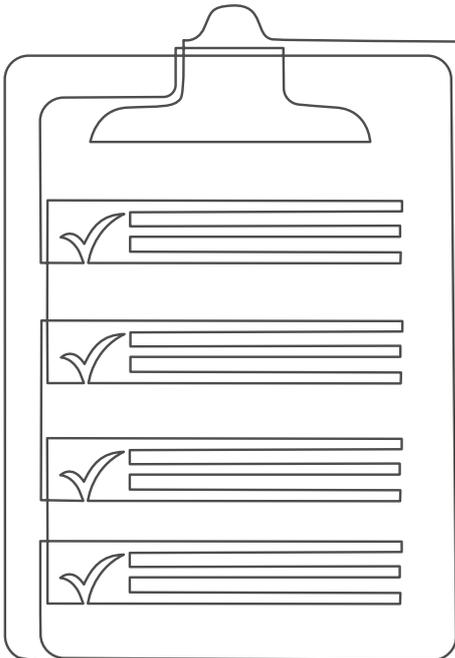
- removing the effects of non-conformities occurrence (e.g. remediation),
- review of non-conformities, including determination of the root causes of their occurrence,
- implementation of actions eliminating the causes of non-conformities, including changes to the EMS, if necessary,
- assessment of the 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 management of chemicals. They relate to all areas linked to having an impact on the environment. For the area of the management of chemicals, the mechanism of action remains the same. In certain cases, the improvement-related elements may result in setting environmental objectives, referred to in clause 6.2 of the ISO 14001 standard.

APPENDICES



Appendix 1 – Initial review

The ISO 14001 standard does not explicitly determine the way environmental aspects and management practices applied shall be identified by an organisation. Often it takes a form of so-called initial review. Regarding the management of chemicals, the review can be carried out by answering the following questions:

- What chemicals are purchased, stored and used? Does the organisation maintain an inventory of the chemicals?
- What is the process for ordering/purchasing chemicals? Are there procedures/instructions for this process? Do all the chemicals follow the same ordering/purchasing procedure? Are there any ad hoc purchases of chemicals that carried out outside the approved supplier network?
- Currently, what are the quantity levels of all the chemicals? Are the quantity levels of the chemicals known at all times by the organisation?
- How are chemicals stored? Does the organisation have, and apply, an established procedure for storing chemicals?
- How are chemicals labelled?
- Does the organisation have valid safety data sheets for chemicals that are present on-site and classified as hazardous?
- Have the flow patterns for chemicals in the production, or any secondary processes, been determined? Have the 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?
- What are the ways of using and applying the chemicals? Have the modes of their use in individual operations been established? Has quantitative or qualitative criteria, related to their application, been established?
- 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 over subcontractors operating outside the organisation's premises?
- During the product or process design stage, does the organisation analyse the consequences resulting from the use of chemicals?

The level of detail within the collected information on 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:

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

The initial review may also include other elements, e.g.:

- determining the context of the organisation, including stakeholders, and their needs and expectations,
- identifying legal, and other requirements, applicable to the use of chemicals.

References to these elements are provided directly when discussing the relevant requirements of the ISO 14001 standard in the main part of the guide.

Collecting answers to the above questions may be useful for both organisations seeking for integrating 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 has sufficient chemical consideration.

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

- What is the primary purpose of the organisation?
- What are the intended outcomes from implementing and maintaining the EMS?

Answering the first question will facilitate the identification of threats 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 the ISO 14001 standard, these intended outcomes should be at least:

- improvement of the environmental effects of operations, i.e. minimisation of adverse impacts from chemicals use or enhancing positive ones,
- compliance with compliance obligations, on the use of chemicals in installations and products as well as related communication,
- 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.

Appendix 2 – Substances that are subject to authorisation and restrictions, and to which special provisions apply

- REACH Regulation candidate list for authorisation – this list 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.,
- substances subject to restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures, and articles - the list in Annex XVII of REACH Regulation includes substances, the use of which is restricted in the EU,
- priority substances under the water policy - Annex X of the Water Framework Directive¹⁰ contains substances identified as priority substances that are targeted for reduction and eventual removal from waste-water discharge; the list includes 'priority hazardous substances' which are subject to special restrictions,
- the list of substances subject to restrictions in electrical and electronic equipment - the list is included in Annex II to the RoHS Directive; the list includes substances whose content cannot exceed the maximum permissible concentrations in a homogeneous material,
- restrictions in electrical and electronic equipment – substances in the list provided as Annex II to the RoHS Directive may not be contained in the equipment in concentrations exceeding defined levels in a homogeneous material,
- restrictions in packaging - the substances are indicated in art. 11 of the Packaging Directive¹¹; the list includes substances whose concentration in the packaging may not exceed the given levels,
- 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.

¹⁰ 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

¹¹ European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste

Appendix 3 – 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:

- air emissions,
- 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,
- water and sewage management,
- exposure to chemical agents and chemical safety,
- food safety and food contact materials,
- products: cosmetics, detergents, toy safety, fertilisers.

Information for individual substances is presented in the form of an information sheet (infocard) containing:

- information identifying the substance,
- classification of the substance according to CLP Regulation with an indication of the most important hazard properties of the substance and its labelling,
- guidelines for the safe use of substances,
- review of substance-related legislation.

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>

Appendix 4 – Examples of forms of legal requirements for chemicals

Legal requirements for chemicals can take the form of:

a. 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, point 26

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

b. 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, point 8

Column 1 Designation of the substance, of the group of substances or of the mixture	Column 2 Conditions of restriction
Polybromobiphenyls; Polybrominatedbiphenyls (PBB) CAS No 59536-65-1	<ol style="list-style-type: none">1. Shall not be used in textile articles, such as garments, undergarments and linen, intended to come into contact with the skin.2. Articles not complying with paragraph 1 shall not be placed on the market.

c. 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, point 23:

Column 1 Designation of the substance, of the group of substances or of the mixture	Column 2 Conditions of restriction
Cadmium CAS No 7440-43-9 EC No. 231-152-8 and its compounds	(...) 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: (i) metal beads and other metal components for jewellery making, (ii) metal parts of jewellery and imitation jewellery articles and hair accessories, including: — bracelets, necklaces, and rings, — piercing jewellery, — wrist-watches and wrist-wear, — brooches and cufflinks. 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 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

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

EXAMPLES::

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 bear 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.'

Appendix 5 – List of regulatory acts applicable to the management of chemicals (non-exhaustive)

1. Acts of international law:

- Agreement concerning the international carriage of dangerous goods by road (ADR), Geneva, 30 September 1957
- Stockholm Convention on Persistent Organic Pollutants, Stockholm Convention, 22 May 2001.

2. European Union legal acts:

- 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
- Directives:
 - Directive 2006/66 / EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157 / EEC
 - 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
 - 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
 - Council Directive of 15 October 1984 on the approximation of the laws of the Member States relating to ceramic articles intended to come into contact with foodstuffs (84/500 / EEC)

- 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 Council 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
 - Directive 2008/112 / EC of the European Parliament and of the Council of 16 December 2008 amending Council Directives 76/768 / EEC, 88/378 / EEC, 1999/13 / EC and Directives 2000/53 / EC, 2002/96 / EC and 2004/42 / EC of the European Parliament and of the Council in order to adapt them to Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures
- Decisions:
 - Commission Implementing Decision (EU) 2019/2031 of 12 November 2019 establishing best available techniques (BAT) conclusions for the food, drink, and dairy industry under Directive 2010/75 / EU of the European Parliament and of the Council
 - Commission Implementing Decision (EU) 2015/2119 of 20 November 2015 establishing the best available techniques (BAT) conclusions for the production of wood-based panels in accordance with Directive 2010/75 / EU of the European Parliament and of the Council
 - Commission Implementing Decision of 11 February 2013 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 tanning of hides and skins
 - Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions under Directive 2010/75 / EU of the European Parliament and of the Council for the production of pulp, paper, and board,
 - 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 of the European Parliament and of the Council / 2009 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).

Appendix 6 – 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:

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

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

Recently, there have been signals 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 a potential sensitive effect on humans by completely eliminating MIT, CMIT and SLS from the line of cosmetics for children.

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 the 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 SDSs .

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.

Appendix 7 – Examples of external communication tools

Labelling of hazardous chemicals

The rules for globally uniform information on hazardous chemicals are provided in The United Nations' Globally Harmonised System of Classification and Labelling of Chemicals (GHS). GHS sets up criteria for the classification of chemicals and sets up harmonised hazard communication elements, including requirements for labelling and safety data sheets.

Classification is the starting point for hazard communication. It involves the identification of the hazard(s) related to chemicals by assigning a category of hazard using defined criteria. Identified hazards need to be communicated to the user. This is done by labelling hazardous chemicals before placing them on the market. Labels identify the hazardous properties of chemicals and inform users about their hazards through standardised symbols and phrases.

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

- supplier's name, address, and telephone number,
- 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),
- product identifiers,
- 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.

The GHS has been implemented in the EU Member States by CLP Regulation.

Guidance on the CLP Regulation requirements for the labelling and packaging of chemicals can be found in Guidance on labelling and packaging in accordance with Regulation (EC) No 1272/2008, European Chemicals Agency, version 4.1, May 2020.

Guidance can be found at:

🔗 https://echa.europa.eu/documents/10162/23036412/clp_labelling_en.pdf

Safety data sheets (SDS)

As stated above, The United Nations' Globally Harmonised System of Classification and Labelling of Chemicals (GHS) also includes criteria for safety data sheets. Once a chemical has been classified, the hazard(s) must be communicated to target audiences. SDSs are one of the tools for chemical hazard communication under GHS.

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 management of chemicals, 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/>

SDS should be produced for all substances and mixtures which meet the harmonized criteria for hazards under the GHS and for all mixtures which contain ingredients that meet the criteria for carcinogenic, toxic to reproduction or specific organ toxicity in concentrations exceeding a certain threshold for SDS specified by the criteria for mixtures.

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:

- a substance or mixture classified as hazardous in accordance with the CLP Regulation,
- a substance that is persistent, bio accumulative and toxic (PBT) or very persistent and very bio accumulative (vPvB), or
- 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:

- a. at least one substance posing human health or environmental hazards in a concentration of $\geq 1\%$ by weight for non-gaseous mixtures and $\geq 0,2\%$ by volume for gaseous mixtures,
- b. at least one substance in a concentration of $\geq 0,1\%$ by weight for non-gaseous mixtures that is classified as one of the following:
 - carcinogenic category 2, or
 - toxic to reproduction category 1A, 1B and 2, or
 - skin sensitizer category 1, or
 - respiratory sensitizer category 1, or
 - has effects on or via lactation,
 - is persistent, bioaccumulative and toxic (PBT),
 - very persistent and very bioaccumulative (vPvB),
 - has been included for reasons other than those referred to in point a) in the Candidate List of Substances of Very High Concern (SVHC) or
- c. 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 Chemicals Agency, version 3.1., November 2015.

Guidance can be found at:

☞ https://echa.europa.eu/documents/10162/23036412/clp_labelling_en.pdf

Appendix 8 – Inventory of chemicals

An essential part of a good management of chemicals 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:
 - CAS number,
 - EC number,
 - REACH registration number.
3. classification of the substance / mixture:
 - hazard pictogram,
 - a signal word,
 - hazard statements,
 - precautionary statements.
4. use of the substance / mixture:
 - the process by which the substance is used,
 - does the substance remain in the article?
5. storage of the substance / mixture:
 - the maximum quantity allowed for storage,
 - storage method,
6. other information:
 - maximum annual consumption,
 - waste classification,
 - additional information.

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

🔗 <https://www.https://www.fitreach.eu/content/tools>

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

🔗 <https://www.https://www.fitreach.eu/>

Appendix 9 – Examples of sources for the operational criteria for management of chemicals

I. Legal requirements:

1. restrictions on use, e.g.:

- REACH Regulation, Annex XVII Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures, and articles¹² - 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,
- RoHS directive¹³ - 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%,
- Paints Directive¹⁴ - 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,
- 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.

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

1. solidification point - ensuring the appropriate storage temperature,
2. vapour pressure - ensuring adequate ventilation of storage places, ensuring an appropriate method of storage preventing the volatilisation of substances under normal conditions,
3. 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.

III. Other sources of operational criteria:

1. the expiry date of the chemicals used, which should be monitored so as not to generate losses and waste,
2. 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).

¹² 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

¹³ 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

¹⁴ 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

Appendix 10 – Sources of information on techniques related to 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.:

- Commission Implementing Decision (EU) 2019/2031 of 12 November 2019 establishing best available techniques (BAT) conclusions for the food, drink, and dairy industry under Directive 2010/75 / EU of the European Parliament and of the Council,
- Commission Implementing Decision (EU) 2015/2119 of 20 November 2015 establishing the best available techniques (BAT) conclusions for the production of wood-based panels in accordance with Directive 2010/75 / EU of the European Parliament and of the Council,
- Commission Implementing Decision of 11 February 2013 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 tanning of hides and skins,
- Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions under Directive 2010/75 / EU of the European Parliament and of the Council for the production of pulp, paper, and board.

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 the EMAS Regulation, e.g.:

- 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),
- 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),
- 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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including ISO 14001 and EMAS registered organisations as well as certifying bodies and consultancies) as well as paid training activities.

The Polish ISO 14000 Forum Association was established in 1996 as a non-governmental organisation associating natural persons interested in environmental management issues. The activities of the Association are financed from the fees of its members (individuals and legal entities -

The strategic goal of the Polish ISO 14000 Forum is to maintain the high credibility of the EMS certification and registration processes. The Forum cooperates in this respect with Polish governmental institutions dealing with environmental management as well as many other partners. Polish Forum ISO 14000 ensured the Polish representation to the Technical Committee 207 of ISO while developing the ISO 14001:2015 standard.