Planet Guideline

Introduction



Our planet as our source of life provides us with food, water, oxygen, and precious resources. In addition, with its unique beauty, it offers fascinating places where not only outdoor sports enthusiasts and nature lovers can recharge their batteries and enjoy life. For us, the focus is on conserving natural resources and helping to avoid sawing off the branch we are all sitting on by acting responsibly daily.

Our vision is to preserve what we love, so that future generations can also live in an intact environment. On this basis we expect from our business partners to make progressive improvement in environmental performance in their own operations and require the same of their partners, suppliers, and subcontractors. This includes integrating principles of sustainability into business decisions; responsible use of natural resources; adoption of cleaner production and pollution prevention measures; and designing and developing products, materials, and technologies according to the principles of sustainability.

Protection of the environment and compliance with social standards has become vital not only for the Outdoor Industry, but the whole Textile Industry with all parts of its supply chain. We are responsible for our products and must not only satisfy the legal safety requirements and safety values for harmful substances, but also want to actively reduce their impact on a global level. Our aim therefore is to perform better than the legal minimum. We intend to create more transparency in our production processes and want to support and empower our partners and their supply chains to pursue that goal by introducing a range of helpful tools. By creating a uniform, obligatory standard (RSL, MRSL), we also aim at helping our suppliers to perform better. Sustainability aspects and performance of production sites, materials and products have and will have significant influence in deuter's business decisions today and in the future.

This document is specifically geared toward the needs of deuter's supply chain, including raw material & chemical suppliers, mills, dye houses, trim & packaging suppliers, screen-printers, factories, and any other entity involved in the manufacturing of our finished goods. In addition to the Promise Policy, it is intended to be guideline as well as training document for a successful implementation of a management system handling the deuter guidelines and standards.

This guideline and its compliance are a commitment between deuter and all suppliers contributing to our products with parts or downstream processes. We want to improve product quality and safety and reduce the release of harmful substances into the environment or to the customer. We also want to draw your attention to the point, that you will be liable for damages, in fact your information given to deuter is not correct or incompliant with deuter's standards.
It is a living document and will be updated regularly to keep up with future developments and to consider feedback we will receive from our business partners and other stakeholders.

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1. Chemical Management

Based on transparency and collaboration, we accept the challenge to build a safer and more sustainable chemical management within our supply chain. Our target is to minimize the use of hazardous chemicals. Where this is not possible, the use as well as the disposal must be organized according to the best available technologies and standards.

This chapter introduces the deuter RSL (Restricted Substance List) based on the bluesign bssl bluesign® and the MRSL (Manufacturing Restricted Substance List) from Zero Discharge of Hazardous Chemicals (ZDHC) to our supply chain. It also provides critical information on how to avoid the discharge of hazardous chemicals via industrial wastewaters and on how to install and manage a chemical inventory and chemical processes in your company. Notable additions to this document are several appendices and links to documents from bluesign®, Zero Discharge of Hazardous Chemicals (ZDHC), The Apparel and Footwear International RSL Management (AFIRM) and Resource Efficient Management of Chemicals (REMC). These documents contain useful templates and tools for an effective risk assessment as well as workable management system information. The aim is that all our suppliers and subcontractors use this toolkit to establish an effective chemical management system and become aware of their influence as part of the whole production process. We oblige suppliers to act accordingly to it and confirm this annually as their standard. It is a binding requirement for doing business with deuter.

1.1. What is Chemical Management?

1.1.1. Definition of “Restricted Substances”

Restricted Substances are chemicals and other materials whose use and/or presence has been banned or otherwise restricted by deuter RSL and/or legislation. A restricted substance must be absent from a finished product or present only in limited concentrations. Also, substances which may be used during production, could be restricted by deuter and/or legislation. Restricted substances may be restricted across many industries, across one industry, or in certain products or inputs.

Video- Understanding Restricted Substances

1.1.2. Why Substances are Restricted

Substances are restricted for many reasons. Some substances are restricted due to environmental concerns, while others are restricted due to health and safety concerns for workers or consumers. Most restricted substances are also restricted by legislation. Substances are restricted in different ways. As noted above, some substances are banned from use during the manufacturing process or banned from finished products entirely. Others might be banned, if they are present above certain concentration limits or if they leach a certain amount of a finished product under predefined conditions. In each case, a substance restriction is usually accompanied by a test method, that companies can use to verify if a chemical is present and, if so, to ensure the chemical is below the defined restricted level.

1.1.3. Purpose of a Restricted Substances List (RSL) and Manufacturing Restricted Substances List (MRSL) & Why it is important to Suppliers

The purpose of a Restricted Substances List (RSL) and Manufacturing Restricted Substance List (MRSL) is to reduce the use of hazardous substances in the textile and apparel supply chain. Both lists clearly set forth for suppliers those chemicals that are restricted. Companies publish RSLs and MRSLs to ensure that suppliers and their subcontractors - as well as internal corporate employees - are aware of and can follow corporate restricted substance requirements. deuter requires that all suppliers comply with the given RSL and MRSL.
Products that do not comply with deuter's RSL are not acceptable. Suppliers need to understand the purpose of the RSL and are recommended to develop their own programs to assure that they comply with RSL requirements. The MRSL has the aim to improve the whole supply chain and goes one step further than the RSL.

1.1.4. Three main Columns to Eliminate Hazardous Substances from the Supply Chain

1 | REACH

deuter is a European Brand and company. Making sure that our products are free from restricted substances, which are listed on the ECHA candidate list from regulation EC No. 1907/2006 (REACH), is a legal requirement and beyond all questions.
As supplier for a European company, all deuter 1st tier suppliers must be aware of regulation EC No. 1907/2006 (REACH). The supplier must ensure that he is aware of the latest ECHA candidate list. We are requiring you to inform us immediately with each publication of an updated or expanded Candidate List about the existence of one or more candidate substances in the articles supplied to us.

Further information & guidance:

- ECHA - REACH

2 | RSL

Making our products safer for our consumer and reducing harmful substances must be achieved through compliance to the deuter Restricted Substances List (RSL).
deuter's RSL is based on the independent bluesign® Restricted Substance List (RSL). The deuter Restricted Substance List (RSL) is a commitment between deuter and our 1st tier suppliers to improve product quality and safety and to avoid the release of harmful substances into the environment or for the customer. This RSL assists and guides deuter and our supply chain to reduce harmful environmental impacts and provides us with a common base for testing products. The RSL specifies the limits for chemical substances in deuter goods and defines usage bans for hazardous chemical substances. Producing according to the standard of the deuter RSL, is a binding requirement for doing business with deuter. The RSL will be updated regularly and provided by deuter.

Please see the attached deuter RSL.

Video – Understanding & Interpreting Restricted Substance List
Video – Best Practices for RSL Compliance

3 | MRSL & CHEMICAL MANAGEMENT

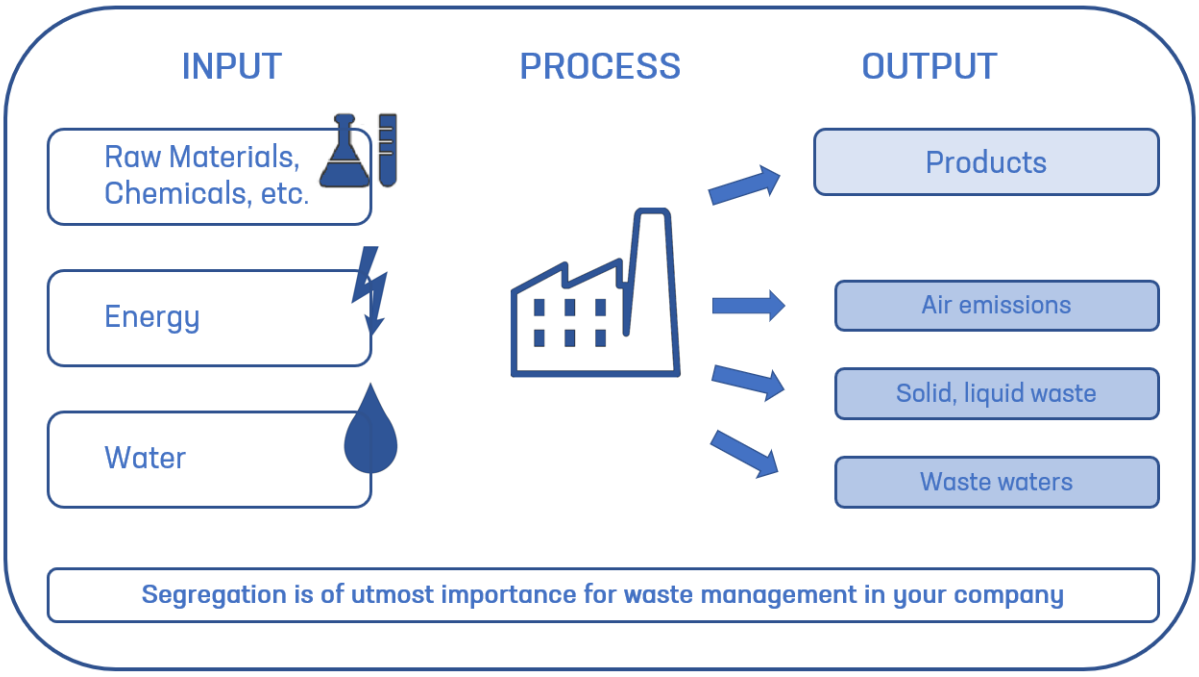
Reducing harmful impacts during production can be achieved through compliance to the ZDHC Manufacturing Restricted Substance List (MRSL) and implementation of a chemical management system throughout.
In comparison to the RSL, which bans harmful substances restricted in materials and finished goods, the Manufacturing Restricted Substances List (MRSL) addresses hazardous substances which are potentially used and discharged into the environment during manufacturing and related processes. A typical RSL sets concentration limits for substances in materials or finished products to comply with product regulation and safety standards. The MRSL establishes concentration limits for substances in chemical formulations used within manufacturing facilities. deuter follows the Zero Discharge of Hazardous Chemicals Program (ZDHC) MRSL which provides many tools to manage and improve the input and output from manufacturing processes and companies. The MRSL is a list of chemical substances banned from intentional use in upstream facilities. the mentioned substances could occur in solvents, cleaners, adhesives, paints, inks, detergents, dyes, colorants, auxiliaries, coatings and finishing agents used during all production steps. The MRSL establishes acceptable concentration limits for substances in chemical formulations used within manufacturing facilities. MRSL limits are designed to eliminate the possibility of intentional use of listed substances beyond the given limits. The aim is, that there is no use of MRSL-listed substances in processes while producing goods for deuter Products. All 1st tier suppliers from deuter must check and commit their own suppliers to the ZDHC MRSL. Together with deuter they have the duty to manage an inventory of their supply chain. The MRSL will be updated regularly and provided by deuter.

Further information & guidance:

- ZDHC MRSL
- ZDHC MRSL Conformance Guidance
- ZDHC MRSL FAQ
- Video- Introduction of Manufacturing Restricted Substance List

1.2. How to implement Restrictions & Chemical Management?

The aim of this guideline is that all our suppliers and subcontractors are in possession of the toolkit that is necessary in order to establish a chemical management system and be aware what input and output they have.



To handle these three columns, it is necessary to implement a chemical management system. The first steps in order to manage and control the quality of the purchased materials and formulations from your vendors, is for you to make an inventory of all used material / trims / chemicals /etc.

Further information & guidance:

- ZDHC Chemical Management System Framework
- GIZ Resource Efficient Management of Chemicals in Textile and Leather Sector Companies
- Video – Chemical Management System for Compliance

1.2.1. Three Steps that help you to start with your Chemical Management System

1. Educate the supply chain: Hand over this guide and toolkit to your suppliers and have them confirm the receipt.
2. Ask your chemical supplier for a **material safety data sheet (MSDS)** for each chemical formulation you purchase.
3. Third party testing: A test report from a third-party testing laboratory can be evidence that the materials and the chemical formulation complies with the RSL and MRSL. Third party testing is generally not necessary if the product already has been assessed and certified.
To create an advanced management structure and documentation, which is needed to support a Zero Discharge of Hazardous Chemicals MRSL, you can follow the ZDHC Chemical Management System (CMS) Guidance Manual. The manual guides you to an effective framework for improving overall environmental and chemical performance.

It allows the continuous improvement of your chemical management and thus results in the minimization of the environmental impact.

The CMS Manual from ZDHC is structured in five sections that follow a PLAN-DO-CHECK-ACT framework, which is used also in other management systems. You will get information and tools about facility plans, material and workflow diagrams, inventorying, input and output, monitoring, hazards and risks, control measures, handling, storage, and personal protection equipment. Step by step you can create a systematic structure and check your efforts.
We choose the three steps from above for this guideline to specify them more detailed on the following pages.

1.2.2. Educate the Supply Chain

deuter is responsible for educating their direct production partners about their RSL and MRSL requirements and procedures. You, as partners, are as well responsible for educating your partners/ suppliers on deuter's RSL and MRSL requirements.

deuter suggests the following steps as a process for educating your own supply chain:
1 | Only do business with RSL compliant companies. Make sure all your subcontractors, accessory suppliers, dye mills, print mills, tanneries, chemical suppliers, etc. are aware of deuter's specific restrictions and have the latest updated version of the guideline and its links available. In order to document the process, a "Declaration of Conformity" should be signed by your suppliers and kept in your records for review. The declaration must be renewed with each RSL Update.
2 | Cooperate with reputable partners. Use and encourage the use of dyestuffs, pigments, and textile auxiliaries from reputable manufacturers only. More information about dye manufacturers is available from the Ecological Toxicological Association of Dyestuffs (ETAD), Basel, Switzerland. www.etad.com
3 | Focus on high quality. When choosing chemicals for dying or other processes, consider deuter's quality requirements. When choosing reputable chemical suppliers, you can often get necessary technical support and dye recipes for free in order to comply with both chemical and quality requirements. High quality dyes are sometimes less expensive when considering total cost (energy, water, time, total chemical usage, quality tests, etc.) and the need to meet color and quality standards.
4 | Request safety data sheets. Insist that the chemical supplier provides material safety data sheets (MSDS) for the dyes and textile auxiliaries supplied. Study of these safety data sheets can help to reveal whether the materials used are free from restricted substances such as aryl amines, disperse dyes, heavy metals such as lead etc.

1.2.3. Chemical Inventory

If chemicals constitute a key production input in your company, your company most likely already maintains a record of the chemicals for purchase and stock management purposes. On a process flow diagram, you can retrieve information about type and location of chemicals and chemical (containing) waste, production process involving chemicals as well as about quantities of inputs and non-product outputs. To create an efficient management of chemicals, the purpose of chemical inventory goes beyond warehousing requirements. The

chemical inventory serves as key reference and chemical management information tool, for example to allow you to assess conformance with restricted substances lists or to report to your company customer. As per ZDHC, the company is expected to create and maintain a comprehensive chemical list, allowing all chemicals in the facility to be identified by name, also recording hazard class, container size, locations of containers and dates on which solutions were prepared or expire, if applicable, and chemicals of concern for your customers. In further course, the inventory is expected to be also used for identification and assessment of environment, and health & safety hazards and risks. Chemicals that MUST be included are...
(A) all chemicals with hazard indication or pictogram on container label,
(B) all chemical materials used in laboratory, pilot facilities and other locations
(C) all compressed gases
(D) any flammable paints, solvents, glues, fuels, and other petroleum product, and
(E) materials that create an explosive or toxic vapor hazard to unprotected personnel during fire emergencies.

1.2.4. How to prepare a Chemical Inventory in line with ZDHC Requirement

The ZDHC inventory template contains further columns which deal with the identification, classification of inherent hazards characteristic as well as listing of chemicals of priority concern (for example ZDHC Manufacturer Restricted Substances List - ZDHC MRSL).
In order to realize this inventory, you should resort to the so-called material safety data sheet (MSDS), also called safety data sheet (SDS) or product safety data sheet (PSDS), which provides you with most of the information. Further test labs like Eurofins, SGS or others and software for Inventory administration may be helpful. https://www.chem-map.com/chemical_news/the-value-of-a-chemical-inventory-log-cil/

Typical **Chemical Inventory Record**

Chemical Inventory Form ....

Chemical Name	Container Amount	Manufacturer	Date of Acquisition	Expiration Date	Storage Location	Special Requirements / Hazards

Further information & guidance:
- ZDHC Chemical Inventory List
- Video - Chemical Safety & Handling Training

1.2.5. Material Safety Data Sheet (MSDS)

A material safety data sheet (MSDS), also called safety data sheet (SDS) or product safety data sheet (PSDS), is an important component of product stewardship and occupational safety and health. It intends to provide workers and emergency personnel with procedures for handling or working with certain substances in a safe manner and

includes information such as physical data (melting point, boiling point, toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures). MSDS formats can vary from source to source within a country depending on national requirements. SDSs are a widely done system for cataloguing information on chemicals, chemical compounds, and chemical mixtures. SDS information may include instructions for the safe use and potential hazards associated with a particular material or product. These data sheets can be found anywhere where chemicals are being used. There is also a duty to properly label substances based on physico-chemical, health and/or environmental risks. Labels can include hazard symbols such as the European Union standard black diagonal cross on an orange background, used to denote a harmful substance. An SDS for a substance is not primarily intended for use by the general consumer, but instead focuses on the hazards of working with the material in an occupational setting. In some jurisdictions, the SDS is required to state the chemicals risks, safety, and effect on the environment.
The GHS hazard pictograms guides you to identify or label a substance clearly. For further Information please refer to this website: http://www.reach-compliance.ch/ghsclp/ghspictograms/index.html

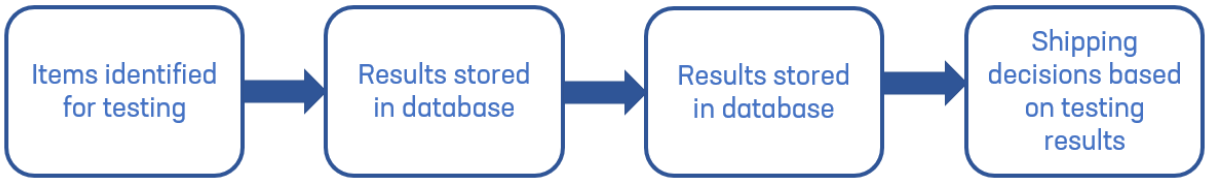
Further information & guidance:
• Video – Understanding & Interpreting a Material Safety data Sheet

NOTE:
MSDS for a specific chemical product or chemical formulation does not necessarily contain information on all its active components and/or additives. Chemical formulations used for the processing of textile materials, components and/or finished products often contain multiple active components as well as formulation additives such as solvents, emulsifiers, preservation agents, salts, etc. The number of intentionally added chemicals in a formulation can be as high as 25. Most active components or additives are of technical grade quality – especially in our textile business – and contain many impurities and/or by-products from their chemical synthesis. MSDS for substances are primarily intended to focus on the hazards and risks for the people working with these chemicals in an occupational setting and not intended for the end consumer. Nevertheless, it is very important to collect good MSDS information from your supply chain. MSDS information together with the information on your final product and the related processes (parameters, chemical consumptions, and air and water emission data) forms the basis of solid chemical product management. For further information on the identification, classification of inherent hazards characteristics as well as listing of chemicals of priority concern, please refer to the attached documents.

1.2.6. Third-Party Chemical Testing

The best way to excel at chemical management is to be knowledgeable about product and material chemistry. Learning the processes and chemicals used by suppliers is the best way to understand product chemistry. Chemical testing is another tool to better understand product chemistry. If required, chemical testing of components and products is preferable to testing of product components, such as fabrics, trims, prints, etc.

Any testing should prioritize components that pose the highest risk .



A thorough knowledge of the chemical processes used in the supply chain is also necessary to identify additional RSL or MRSL risks that might be introduced during manufacturing processes. A test report and/or certificate from a third-party testing laboratory or recognized certification body can attest that the material or the chemical formulation complies with the RSL and MRSL (for example, deuter products may not contain any PFC's. Generally, third-party testing is not necessary, if the product already has been assessed and certified by a credible third-party organization (e.g., bluesign system). Testing or certification should be traceable to the product supplied.
If there are any non-compliances with the RSL and MRSL during development process of a new material:

- Report it to Duke or Bellmart and additionally to deuter
- Work out a solution before production stage (material change, dyestuff change, ...)

If there are any non-compliances with the RSL and MRSL during inspection of deuter product:

- Stop production
- Replace with alternative materials
- Destroy non-compliant materials --> please compare to waste management!

More detailed guidance is available in ZDHC Chemical Management System Guidance Manual. As part of due diligence, it is important that deuter performs a degree of analytical testing to monitor and prove product and supplier performance. Auditing suppliers and setting specifications alone is insufficient to ensure our products are legal and safe. Analytical testing is not designed as a tool to manage quality, although the information gathered from this testing may be used to monitor this indirectly. This product data will be used to defend our standards when challenged by the trading standards or courts. The product data will also be used when challenged by the media and other non-enforcement agencies such as consumer groups or NGOs. They will be used externally to form part of our formal due diligence defense and internally to demonstrate that all management processes are in-place and operating correctly.

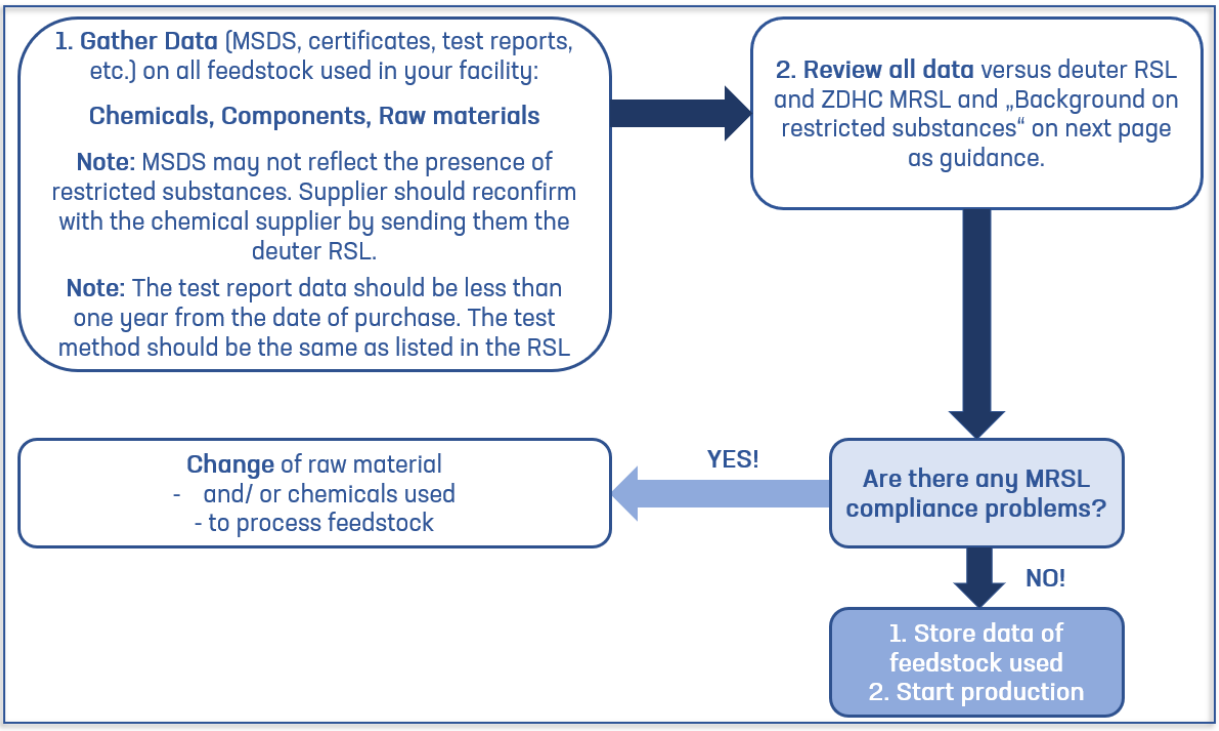
1.3. Why is Chemical Management important?

In the textile supply chain, there are certain types of fibers and materials that are more likely to contain restricted substances. Many brands require testing of products prior to shipment to assure that the shipment does not contain articles not in compliance with the RSL. For further information you can find a matrix at the first pages of the deuter RSL.

Video – Risk Assessment of Chemicals

1.3.1. Understanding Chemical Risks

Technical managers must risk assess each material in order to decide if the material needs testing and what needs to be tested. They must identify any physical and chemical testing that is required.



1.3.2. Hints & Tips when deciding what to test

- All new suppliers are deemed high risk and will be subject to a high-test frequency in their first season until a level of confidence is established.
- All suppliers who have historically performed well (less than 2 surveillance testing fails in the past 12 months) are deemed as low risk for the purpose of this program and will only be subjected to random ad-hoc testing.
- Continuity materials should be tested once a year.
- All products with a promotional claim should be tested, for example: stain resistant or waterproof / water resistant.
- All Metal components in intimate prolonged contact with the skin should be tested.
- Leather should be checked for chromium VI.
- Technical managers should submit their testing recommendations quarterly to management for review and approval.
- This information will then be submitted to the nominated testing laboratories.
- Understanding the chemical risks in your supply chain, processes and product is critical in making good and appropriate decisions.

1.3.3. Background on Restricted Substances

The following table provides basic background information on some of the substances (or categories of substances) typically included on restricted substances lists. A brief description of the substance and where it may be found in textile products is included. We are providing this information for general background purposes. It is advisable to consult your own internal materials experts or seek outside expertise to learn more about these specific substances and their potential occurrence in your product lines.

Restricted Substances	Description & where they may be found
Alkylphenols (AP) Alkylphenol Ethoxylates (APEOs) Nonylphenol Ethoxylates (NPEO) Octyl phenol Ethoxylates (OPEO) Nonylphenol (NP) Octyl phenol (OP)	APEOS are non-ionic surfactants including NPEOs, OPEOs, NP, and OP. NPEOs and OPEOs degrade into NP and OP, respectively. APEOs can be used as or found in: • Detergents • Scouring agents • Wetting agents • Softeners • Emulsifier/dispersing agents for dyes and prints • Impregnating agents • Degreasing agents for leather • Leather Finishing • De-gumming for silk production • Dyes and pigment preparations • Polyester padding • Down/feather fillings
Bisphenol-A (BPA)	Bisphenol-A (A=acetone) (BPA) occurs in its pure form as white flakes with a faint phenol-like smell. It is used in the production of epoxy resins and polycarbonate plastics. It can be used in production of flame retardants and in PVC production and processing.
Cationic Surfactants DSDMAC DTDMAC DHTDMAC	Distearyldimethyl ammonium chloride (DSDMAC), Ditallowdimethylammonium (DTDMAC) and Di (hydrogenated tallow) dimethylammonium chloride (DHTDMAC) belong to the group of “quaternary ammonium salts” and are used as cationic surfactants. DSDMAC, DTDMAC, DHTDMAC are used as or found in: • Leveling agents (retarders) for basic (cationic) dyes that are mostly used for acrylic fibers • Fixation of direct dyes that are mostly used for cotton, rayon (viscose), linen, silk, and polyamide • Surfactants • Emulsifier • Antistatic agents • Softeners • Water repellent agents

Restricted Substances	Description & Where they may be found
Chlorinated Bleaching Agents	Chlorinated Bleaching Agents are used for bleaching textiles and paper, etc. **Textiles** Chlorine dioxide (ClO2), sodium hypochlorite (NaClO) and calcium hypochlorite (Ca (ClO)2). **Paper** Chlorine gas (Cl2) and chlorine dioxide (ClO2)
Chlorinated Aromatic Hydrocarbons Hexachlorobenzene Monochlorobenzene Pentachlorobenzene Pentachlorotoluene Isomers of di-, tri-, and tetra-chlorobenzene Isomers of mono-, di-, tri-, and tetra- chlorotoluene	Chlorinated aromatic hydrocarbons are used as carriers in the dyeing process of polyester or wool/polyester fibers. They can also be used as solvents.
Chloroparaffins **Short chained** (SCCPs)	Chloroparaffins are hydrocarbons with a straight carbon chain. **They can be used as:** • Flame retardants • Leather greasing agent • Fat Liquoring of leather
Chloroparaffins **Medium chained** (MCCPs)	
Chromium VI (Cr6+)	Chromium is a naturally occurring metal that can exist in three main forms (Chromium (0), Chromium (III), and Chromium (VI). In nature, Cr (III) is the predominate form. Cr (0) and Cr (VI) do not occur in nature or are rare. Chromium is used in leather tanning and can be oxidized into
Dimethylformamide (DMF)	DMF is a solvent used in plastics, rubber, and polyurethane (PU) coating. It has a strong smell in the finished product. Water-based PU does not Contain DMF and is therefore preferable.
Dimethylfumarate (DMFu)	Dimethylfumarate is an anti-mold agent used in sachets in packaging to prevent the build of mold, especially during shipping.
AZO Dyes and Pigments	Azo dyes and pigments are colorants that incorporate one or several azo groups (-N=N-) bound with aromatic compounds. Thousands of azo dyes exist, but only those which degrade to form listed amines are restricted. Azo dyes are used in dyed fabric or leather.

Restricted Substances	Description & Where they may be found
Dyes – Disperse Dyes	Disperse dyes are a class of water-soluble dyes that penetrate the fiber system of synthetic or manufactured fibers and are held in place by physical forces without forming chemical bonds. Restricted disperse dyes are suspected of causing allergic reactions. Disperse Dyes are used in synthetic fiber (e.g., polyester, acetate, polyamide).
Flame Retardants	Flame retardants are chemical compounds that can be incorporated into textiles or applied by sprays to decrease the flammability of the product. Flame retardant chemicals are often used in children's clothing and tent fabrics (PU coatings) to meet safety standards.
Fluorinated Greenhouse Gases	Fluorocarbons are mainly used as substitutes for CFCs (Chlorofluorocarbons) and HCFCs (Hydrofluorocarbons), both of which are ozone depleting substances that the 1987 Montreal Protocol has progressively phased out of production. Fluorocarbons are mostly used as refrigerants in refrigerators and air-conditioners and as propellants in industrial aerosols. Other applications include foam-blowing, solvent cleaning, and textile coating. Textiles coated with fluorocarbons provide good resistance to weathering, UV light aging, chemical and soil resistance. Treated textiles also give good water-proof and anti-pilling effect. They are most likely to be found in coated textiles.
Formaldehyde	Formaldehyde is a volatile compound used widely in apparel and textile manufacturing as an anti-creasing and an anti-shrinking agent. In addition, formaldehyde is often used in polymeric resins (e.g., phenol-formaldehyde and urea-formaldehyde). Because of its volatility it can easily spread by cross contamination from one garment to another. **Formaldehyde/ formaldehyde releasing compounds are applied for:** • Permanent press and artificially stiffen fabric • Dimensional stability control (i.e., pre-shrinkage) • Easy-care • Crinkle treatment • Fixation or preservation of dyes and prints • Adhesives for flock prints • Binders for pigment prints • Fluorescent dyes and pigments
Isocyanates	Isocyanates are used in the production of polyurethane plastics and foams. When testing PU for Isocyanates it is important to follow the standard method, since certain conditions result in false positives.

Restricted Substances	Description & Where they may be found
METALS	
Arsenic (As)	Arsenic is a half-metal element. It can be present as a pure metal, as non- metal, or as Arsenic compounds (e.g., salts). Arsenic and its compounds can be used in some preservatives, pesticides, and defoliants for cotton. It is also associated with synthetic fibers, accessories for textiles and clothing, paints, inks, trims, plastics, and metal components.
Antimony (Sb)	Antimony is a half-metal element. It can be present as a pure metal, as non-metal or as Antimony compounds (e.g., salts). **Antimony is found in or used as:** • Catalyst in polymerization of polyester • Flame retardants • Fixing agents • Pigments • Alloys
Cadmium (Cd)	Cadmium is a naturally occurring and abundant metal that does not easily corrode (rust). It can be present as a pure metal or as cadmium compounds (e.g., salts). **Cadmium compounds are found in or used as:** • Pigments (particularly red, orange, yellow, and green) • Stabilizer for PVC plastic • Fertilizers • Biocides • Alloys for plating of other metals. • Paints (e.g., surface paints on zippers and buttons)

Restricted Substances	Description & Where they may be found
Chromium (Cr)	Chromium is a metal element that can be present as a pure metal or as Chromium compounds (e.g., salts). (See also Chromium VI). **Chromium compounds can be used as:** • Dyeing additives • Dye-fixing agents • After-treatments to improve color fastness • Dyes for wool, silk, and polyamide (especially dark shades) • Tanning of leather **Most Cr containing dyes can be put in one of the following categories:** **Metal complex dyes** • 1:1 metal complex • 2:1 metal complex **Mordant dyes** • Metachrome • After-chrome Textile (except polyamide, polyamide blends & worsted wool) • Never use dyes based on, or containing Cr. Never use Cr-fixation of dyes (Mordant dyes).
Chromium (Cr)	**Polyamide, polyamide blends and worsted wool** • Most important for dark shades • Consult your dye stuff supplier to make sure the dye is bound strongly enough and that you're not using more Cr than needed. There are reactive dyes and acid dyes suitable for the critical fibers. Preferred dyes depend on the color and the fiber.
Cobalt (Co)	Cobalt is a naturally occurring metal element that can be present as a pure metal or as Cobalt compounds (e.g., salts). • Cobalt metal can be used in alloys. • Cobalt compounds can be used as pigments and in dyestuff. • Cobalt salt is used as initiator in curing of unsaturated polyester in the production of plastic buttons.

Restricted Substances	Description & where to be found
Lead (Pb)	Lead is a naturally occurring metal element that can be present as a pure metal or as Lead compounds (e.g., salts). It is important to the production of batteries, fuels, paints, plastics (as a heat stabilizer), ceramics, caulking and solders. In apparel and footwear, lead may be associated with plastics, paints, inks, pigments, surface coatings and metal components.
Mercury (Hg)	Mercury is a naturally occurring metal element that can be present as a pure metal or as Mercury compounds (e.g., salts). It can exist as metallic mercury (liquid), a gas (when heated), or as solids (inorganic and organic compounds). Mercury compounds can be present in pesticides and can be found as contamination in caustic soda (NaOH). Mercury compounds can be used in paints, (e.g., surface paints on zippers and buttons).
Nickel (Ni)	Nickel is an abundant metal element that can be present as a pure metal or as Nickel compounds (e.g., salts). It is often combined with other metals to create alloys with increased hardness and resistance to corrosion. Nickel metal is mainly used for plating of alloys, improving the corrosion resistance in alloys, improving the hardness of alloys and is a key element in the production of stainless steel. Certain dyestuffs contain complex- bound Nickel. Both Nickel metal and Nickel compounds can occur as an impurity in pigments and alloys.
Other Metals	Metals like Selenium (Se) and Barium (Ba) may be associated with synthetic fibers, accessories for textiles and clothing, paints, inks, trims, plastics, and metal components.
Octamethylcyclotetrasiloxane	Octamethylcyclotetrasiloxane can be used in textile softeners.
Organotin Compounds	Organotins are a class of chemicals combining tin and organics such as butyl and phenyl groups. Organotins are predominantly found in the environment as antifoulants in marine paints, but they can also be used as biocides (e.g., antibacterials), catalysts in plastic and glue productions, and heat stabilizers in plastics/rubber. In textiles and apparel, organotins may be associated with textiles plastics/ rubber, inks, paints, metallic glitter, and heat transfer material.

Restricted Substances	Description & where to be found
Organotin Compounds	Organotins are a class of chemicals combining tin and organics such as butyl and phenyl groups. Organotins are predominantly found in the environment as antifoulants in marine paints, but they can also be used as biocides (e.g., antibacterials), catalysts in plastic and glue productions, and heat stabilizers in plastics/rubber. In textiles and apparel, organotins may be associated with textiles plastics/ rubber, inks, paints, metallic glitter, and heat transfer material.
Phenols Pentachlorophenol (PCP) Tetrachlorphenol (TeCP) O-phenylphenol (OPP)	Phenols are polychlorinated compounds used as preservatives or pesticides. Pentachlorophenol (PCP) and Tetrachlorphenol (TeCP) are sometimes used to prevent mold and kill insects when growing cotton and when storing/ transporting fabrics. PCP/TeCP can also be used as a preservative in print pastes. O-phenylphenol (OPP) can be used for its preservative properties in leather or as a carrier in dyeing processes.
Phthalates	Esters of orth-phthalic acid or "phthalates" are a class of organic compounds commonly added to plastics to increase flexibility. They are sometimes used to facilitate molding of plastic by decreasing its melting temperature. **Phthalates can be found in:** • Flexible Plastic components (e.g., PVC) • Print pastes • Adhesives • Plastic buttons • Plastic sleevings • Coatings
Polyvinyl **chloride (PVC)**	PVC (also known as vinyl) is a chlorinated polymer used extensively. Vinyl products include credit cards, furniture, toys, flooring, cable/wire insulation, garden hoses, and coats. PVC can be found in plastic items and trim in apparel and footwear. PVC is typically used in: • Badges • Sequins • Zipper pulls • Stickers • Coating on textiles for rainwear • Prints • Synthetic leathers • Flip Flops / footwear

Restricted Substances	Description & Where they may be found
Perfluoro Compounds PFOS PFOA	Perfluorooctanesulfonic acid is an organofluorinecompound. Salts of this compound are often used as surfactants. Like other fluorocarbons the C8F17 subunit in this compound repels water, and PFOS is the main ingredient in many stain repellent finishes. PFOS is used as a binder in non-woven fabrics to enhance dyeing, wetting agents to improve coverage and penetration of substances, achieve finish- on-yarn uniformity, and water resistance, oil resistant coatings on textiles, leather, and other materials. Perfluorooctanoic Acid is used in the production of fluoropolymers which are used as impregnating agents on textiles (e.g., water repellents on jackets).
Polychlorinated Biphenyles (PCBs) Polychlorinated Triphenyles (PCTs)	PCBs and PCTs are large molecules containing many chlorine atoms. PCBs/ PCTs are mainly used as pesticides but also as softeners, carriers, and flame retardants.
Polycyclic Aromatic Hydrocarbons (PAHs)	Polycyclic Aromatic Hydrocarbons (PAHs) are natural components of crude oil, and they are a common residue from oil refining. PAHs have a characteristic smell similar to the smell of car tires or asphalt. Oil residues containing PAHs are added in rubber and plastics as a softener or extender. Therefore, PAHs are risky in rubber, plastics, lacquers and coatings. PAHs are often found in the outsoles of footwear and in printing pastes of screen prints. PAHs can be present as impurities in Carbon Black. Clean mineral oils should be used in the rubber to avoid PAHs.
Solvents	Organic solvents are widely used in chemical preparations. They are also used in many processes such as dry cleaning. Some organic solvents are highly volatile. In apparel and footwear, solvents are used as finishing/cleaning and printing agents, for dissolving and diluting fats, oils and adhesives (e.g., in degreasing or cleaning operations).
Triclosan	Triclosan can be used as disinfectant and as an antibacterial agent in textiles.

Although we do not anticipate that the following substances will be found in finishes apparel, it is important to note that they are restricted:

Restricted Substances	Description & Where they may be found
Asbestos	Asbestos is a naturally occurring group of fibrous silicate minerals. These thin, long, and flexible fibers can be woven into textiles. Asbestos fibers are strong, durable, and fire-resistant. Unlikely to be found in current textiles except for fire-fighting clothing.
Dioxins and Furans	Dioxins are made up of 75 polychlorinated compounds called chlorinated dibenzo-p-dioxins. Each dioxin has a different level of toxicity based on its structure and tissue absorption qualities. Furans are also polychlorinated compounds (135 different furans exist). Dioxins and furans are structurally and toxically similar. Dioxins/furans are common by-products of incomplete combustion (burning) of organics in a chlorine rich environment and are often associated with the production of pesticides, PVC, and other similar chlorinated chemicals. It is unlikely that dioxin and furan legislation will apply to apparel and footwear.
Pesticides	Pesticides compounds are used for preventing growth of insects or fungi on plants, animals, or materials. In the textile industry they are mainly used in production and transportation of natural fibers (e.g., cotton, wool). Dieldrin and DTTB are pesticides that may be found in natural fibers during growth and processing. In apparel and footwear, these pesticides may be found in natural fibers, primarily cotton.

1.3.4. Screen printing & Application/Finishing best Practices

For restricted substances not subject to usage bans, deuter's RSL restrict them to certain concentrations in components of finished products. These substances may be used, but appropriate steps must be taken to ensure that residual amounts or contaminants do not exceed limits. Solvents, for example, may be used with careful attention to drying/ curing times to greatly reduce or eliminate them altogether. This appendix provides general guidance on drying/curing best practices as well as examples of good and bad practices for maintaining screen print production areas.

DRYING /CURING BEST PRACTICES:

Many applications and finishes require curing, such as resin finishing for a 3D-effect, easy-care, or screen printing. 'Curing' is not limited to drying materials or garments but involves chemical reactions that begin at specific temperatures and take time to complete. It is important to understand and control the curing temperature and duration to fully react ingredient chemicals. Information about appropriate curing conditions can be obtained

from your chemical suppliers. Improper / incomplete curing may lead to both chemical product safety (RSL) and performance issues

SUPPLIERS WORKING WITH RESINS, SCREEN PRINTS, OR OTHER APPLICATIONS THAT REQUIRE CURING SHOULD:

- Request Technical Data Sheets (TDS) from their chemical suppliers and follow the listed curing condition instructions.
- Document the finishing/screen-print formulation and curing conditions.
- Calibrate the oven regularly and keep the calibration record. (The digital display attached to the oven may not represent the actual temperature in the oven.)
- If a conveyor belt oven is used in factories located in colder climates, understand the temperature gradient at different parts of the oven, as this may result in inconsistent quality or concentrations of residual chemicals in the finished product.
- Start the curing time requirement when the garment surface temperature reaches the required curing temperature, not simply when the garment is placed in the oven! Temperature checking stickers are available, but these only record the highest temperature on the garment surface. There are also digital devices which can check the garment surface temperature at regular time intervals. These devices can give a more detailed profile of the garment surface temperature differences, which allow for better control of the curing process.

1.3.5. Wastewater Management

The requirements of deuter also include responsible wastewater management as the discharge of wastewater containing hazardous chemicals can have a significant impact on the environment and human health. In order to create an effective wastewater management system, we recommend you resort to the ZDHS program.
The ZDHC Program recognizes the value of addressing hazardous substances that may be discharged into the environment during the manufacture of materials used in the textile and footwear industry. That is hazardous substances that could be used deep within the supply chain and not just those substances that could be present in finished goods. In 2015, the ZDHC Program commissioned a study to better understand the regulatory landscape of wastewater discharge regulations and guidelines across the textile industry.
The report of the study – Textile Industry Wastewater Discharge Quality Standards: Literature Review – found that:

1 | Current wastewater regulations are far from requiring zero discharge of hazardous chemicals.
2 | Wastewater guidelines published by different brands, as well as amongst multibrand consortia, vary greatly.

The conclusion of the report is that there is a need for uniform, global guidance pertaining to wastewater discharge quality, as well as testing and reporting, to enable a more sustainable industry.
The purpose of the ZDHC Program's Wastewater Guidelines is to define a single, unified expectation concerning wastewater discharge quality that goes beyond regulatory compliance, not only for conventional wastewater parameters, but also for hazardous chemicals. These guidelines build upon the ZDHC Manufacturing Restricted Substances List (MRSL) - a list of chemical substances banned from intentional use in facilities that process textile materials and trim parts for the textile and footwear industries. The first step towards the prevention of wastewater contamination is for facilities to avoid the use of restricted chemical substances by using chemical formulations

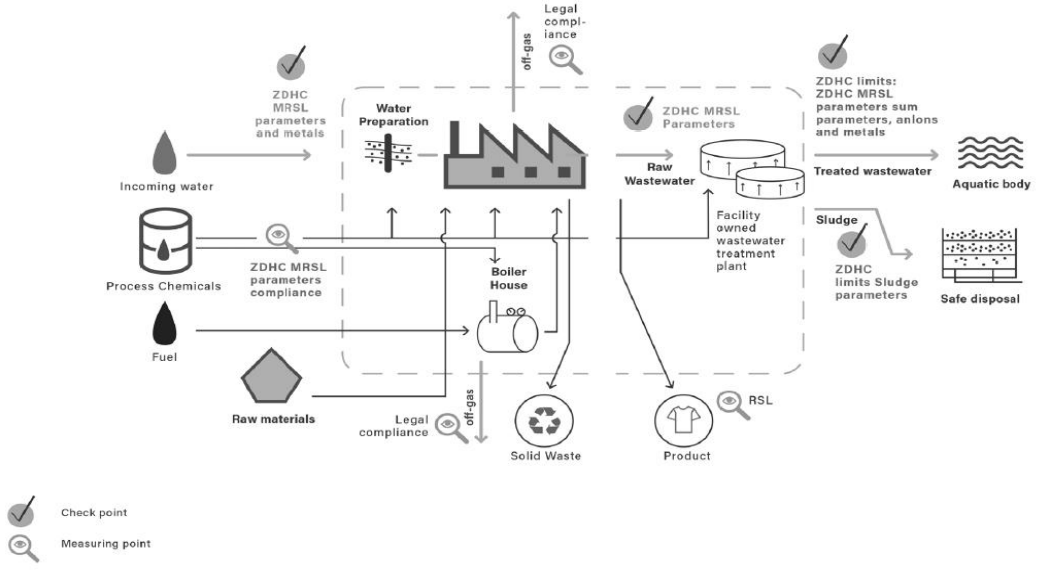
that are conform to the ZDHC MRSL. Facilities should then ensure wastewater is treated prior to discharge in a way that either removes the chemical physically or by chemical reaction or biological degradation.
On this baseline, the Wastewater guidelines include analytical test methods and sampling procedures, so that the suppliers can share their testing results in a systematic and efficient manner.

THE EXPECTED OUTCOMES OF USING THESE GUIDELINES ARE TO:

- Ensure wastewater discharge does not have an adverse impact on communities and the environment.
- Create a unified monitoring and testing program to aid suppliers to share discharge data systematically and efficiently with consumers, brands, and other interested parties.
- Reduce supplier operating costs and increase operational efficiencies by defining a standard cadence for wastewater and sludge testing and reporting requirements which applies to all consumer brands that adopt this guideline.
- Define pass/fail reporting limits for the analytical testing of hazardous chemicals in wastewater discharges and sludges produced during wastewater treatment operations.

TEST METHODS

The test methods recommended in these guidelines are based on internationally recognized standard water and wastewater testing methodologies as well as government recognized testing requirements in the European Union, the United States of America and China. It is expected that the standard test method used is the one most applicable for the region in which the wet manufacturing occurs. For the ZDHC MRSL listed substances/substance group, generally recognized standard tests methods are specified. Reporting limits for the ZDHC MRSL substances/substance groups stated within these guidelines are based on laboratory
practice criteria and capabilities for achieving these reporting limits globally.



(Pic source: ZDHC_Wastewater_Guidelines_2016)

Further information & guidance:

E-Learning Chemical Management
There is a comprehensive E-learning course for chemical management freely available at the atingi platform. **We highly recommend using this easy to access platform!** There are different interesting learning methods like Videos, presentations, and quizzes. It is not necessary to do the whole eLearning course, you can also pick the topics of need and complete these modules.
These steps must be taken:

1. Open https://www.atingi.org/
2. Register on the platform
3. Search the course "e-REMC - Chemical Management Training"
4. Enroll to the course and complete all modules or just the modules you are interested in.

- ZDHC Wastewater Guidelines
- ZDHC Wastewater Guidelines FAQ

1.3.6. Questions and Answers

Q: ARE RSL REQUIREMENTS VALID FOR SEWING THREADS?
A: Yes, deuter's RSL also applies to sewing threads.

Q: HOW DO YOU KEEP THE PACKAGING (BOXES AND PLASTIC BAGS) FROM CONTAMINATING THE FINAL PRODUCT DURING SHIPMENT?
A: Packaging materials should comply with both RSL and global regulation as applicable. This should minimize any contamination of the final product by contact with packaging materials.

Q: HOW DOES DEUTER DEFINE "SKIN CONTACT"?
A: Generally, any material or component that comes into direct contact with skin. That means all apparel products 1st layer and 2nd layer. Additional materials located on the backside of all deuter Packs, and any kind of shoulder strap material are skin contact materials. All accessories including belts or caps are considered to have components/materials that come in direct skin contact. Certain regulations restrict substances in components that come into direct and "prolonged" skin contact (REACH restrictions of azo amines and nickel for example). There is a distinction between direct skin contact and prolonged skin contact, since some materials/components may briefly contact the skin (internal bag components) while others may contact the skin for the entire duration of use (pants, shirts for example). If you have any questions about a material, component, or product, you should consult directly with deuter.

Q: WHAT ARE THE DIFFERENCES BETWEEN THE USA-CPSIA, EUROPE-REACH AND CHINA REGULATIONS, AND HOW DOES THE RSL RELATE TO THEM?
A: Each country or region has their own specific regulations. The RSL tries to capture the most stringent regulation globally and apply restrictions or limits. RSL testing can be of production quality material components before they are made into finished products, on current production or postproduction product. CPSIA, the EU and China regulations are written such that they apply to finished product testing.

Q: HOW DOES DEUTER INTEGRATE OEKO-TEX INTO THEIR RSL PROGRAMS?
A: The Oeko-Tex 100 standard is highly comparable with the RSL. Over 80% of Oeko-Tex content mirrors this RSL, but there are some specific differences.

Q: DOES DEUTER ALLOW MATERIAL SUPPLIERS TO TEST A MATERIAL AND USE THOSE RESULTS TO DEMONSTRATE COMPLIANCE TO DIFFERENT BRANDS' RSLS?
A: If the material to be provided to different buyers is the same, and if the restricted substance requirements, test methods and limits are the same (same RSL), then the results of the testing may be relied upon by different brands.

Q: CAN SUPPLIERS RELY ON RSL TEST RESULTS OF RAW CHEMICALS FROM ACCREDITED LABS?
A: RSLs cover chemical substances found in/on products, not in the raw chemicals themselves. However, chemical companies should verify to their customers the presence or absence of substances in their chemicals for informational purposes. One way is to test chemical products and share the results with their customers.

Q: NORMALLY, WHAT IS THE MOST REASONABLE/ PRACTICAL SAMPLING PERCENTAGE IN GENERAL OR THAT YOU RECOMMEND FOR RSL TESTING?
A: Sampling products for testing is not an easy decision. The objective is for the product manufacturer and deuter to have confidence that residual chemicals on products comply with all chemical restrictions.
When you are not confident, testing is necessary.

Q: CLEARLY ALL ELEMENTS OF THE SUPPLY CHAIN HAVE A RESPONSIBILITY TO CONTROL RESTRICTED SUBSTANCES, BUT WHO TESTS? IF A SAMPLE IS TESTED UPSTREAM IN THE SUPPLY CHAIN, DOES IT MEAN THAT FURTHER DOWN THE CHAIN THERE IS NO NEED TO TEST? WHERE DOES DUE DILIGENCE STOP?
A: The timing of testing depends on brand requirements and the product type. Any point in the Supply chain has a possibility to cause a product to fail. In many cases the largest chemical impact is at the raw material (i.e., fabric, trims) stage. Testing at this stage can provide information about compliance prior to assembling the finished product and allow for the testing of a material only once if it is used on several finished products. However, in order to guarantee compliance of a garment-treated or embellished product, it may be necessary to test at the finished product stage. Any chemical treatment to a consumer product could introduce restricted substances, so it is important for suppliers to purchase and use only chemicals which are known to be free of substances restricted by RSL.

Q: WHEN SHOULD HEAT TRANSFER MATERIALS BE TESTED?
A: Heat transfers should ordinarily be tested by the vendor / supplier before application. Testing of the completed heat transfer should be conducted if restricted substances are showing up in the completed heat transfer that were not contained in the original materials. It is possible that the transfer process can create restricted substances from chemical reactions between the transfer materials.

Q: WHY IS THERE A DIFFERENCE BETWEEN TEST RESULTS FROM WET (OR LIQUID) PAINTS/INKS/ADHESIVES AND DRY (AS APPLIED) PAINT/INKS/ADHESIVES?
A: Chemical changes may occur during drying or curing of the material. A good example is formaldehyde in some coatings. Free formaldehyde is removed during the curing stage, so no free formaldehyde is found in the dry material.

Q: FOR AN EMBROIDERED BADGE, CAN RSL TESTING BE PERFORMED USING A COMPOSITE TEST FOR ALL COLORS AND ALL DIFFERENT LAYERS?
A: RSL testing should be performed by compositing the colors. A separate test of the adhesive layer should be performed if it is possible to separate that adhesive layer.

Q: IF A DEUTER SUPPLIER BUYS MATERIAL FROM A NOMINATED SUPPLIER (SUBCONTRACTOR) WHO CANNOT PROVIDE OR DOES NOT HAVE A PROPER MSDS, should the supplier (manufacturer of finished product) continue to buy from them?

A: Nominated or not, suppliers should always make sure their subcontractors use raw materials for which they can provide MSDS and/or RSL compliance declarations. Suppliers should push them until they do or inform deuter about the problems.

Q: CAN SUPPLIERS REALLY RELY ON CHEMICAL COMPANIES EVEN THOUGH THEY SUPPLY MSDS AND CERTIFICATIONS - ARE THEY RELIABLE AT ALL?

A: Material Safety Data Sheets do not typically provide the type of information needed to know if the end product will meet specific chemical restrictions. However, MSDS's may provide some clues. A first step is for brand suppliers to have a good relationship with their chemical suppliers. This relationship should include suppliers providing the RSL to their chemical suppliers for them to provide information regarding the potential presence of a restricted substance. If a restricted substance is part of the chemical formulation, then a garment manufacturer (e.g., mill, laundry, etc.) must either use the chemical in a way wherein they are confident any restricted substance will not exceed the limitation of the RSL or test the product.

Q: HOW DOES DEUTER VERIFY IF A SUPPLIER COMPLIES WITH THEIR RSL LIST?

A: In a variety of ways - supplier education and training are a priority for deuter. Testing at independent outside laboratories plays a role in our RSL Compliance Program, but it can vary from requiring suppliers to 1) test regularly; 2) selectively test based on past performance; 3) randomly test; or 4) testing based on risk assessment.

Q: IS IT TRUE THAT FAILURES MAY BE DUE TO COST SAVINGS?

A: Yes, trying to save cost can result in products with undesirable levels of restricted substances. This can happen when factories buy raw materials and chemicals from unreliable supply houses that do not know or will not reveal what is in them. It also happens when no testing of raw materials and/or products applies. Taking short cuts in this manner to offer the lowest cost product carries a significant risk of much higher enforcement costs downstream. It is the responsibility of suppliers and brands alike to seek cost-effective means of assuring there is no exposure to toxic chemicals.

Q: EVEN THOUGH CARRIERS ARE NOT USED IN POLYESTER DYEING, COCS (CHLORO ORGANIC CARRIERS) ARE DETECTED IN TRACE AMOUNTS. WHY IS THIS?

A: COCs could, due to their toxic characteristics, also be used as preservatives, insecticides, and biocides. This means that raw materials such as dyes, chemicals and fibers could contain trace amounts of COCs, either from manufacturing, storage, or transport. COCs are used in the manufacturing process of some dyes and could therefore remain as traces in the finished dyes. For good quality dyes from reputable sources, those traces should be low enough to meet requirements. A close communication between suppliers and chemical and raw material suppliers is essential.

Q: HOW DO WE IMPROVE/REMEDIATE FORMALDEHYDE FAILURES?

A: For textiles, you might be able to rinse out the fabric. However, for other materials such as adhesives, formaldehyde failures cannot be fixed without changing the ingredients. Consult with deuter before attempting to improve or remediate a formaldehyde failure since the cost of water/ energy/ environmental impact time may not be worth the effort for only a small reduction in formaldehyde content.

2. WASTE MANAGEMENT

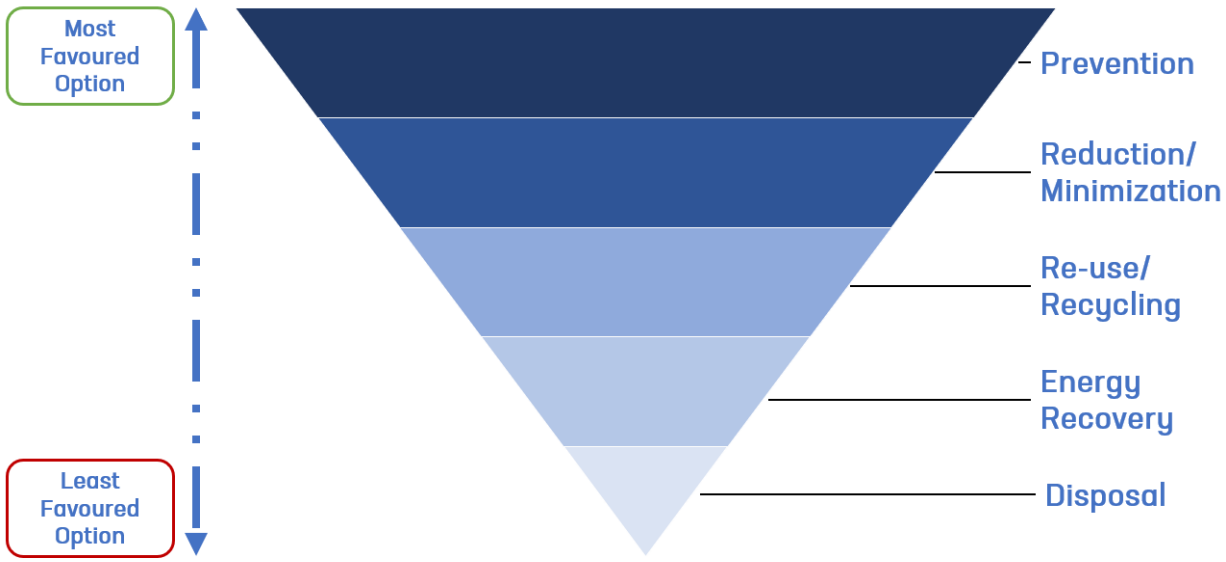
2.1. What is Waste Management?

Waste management is the activities and actions required to manage waste from its inception to its disposal. This includes the collection, transport, treatment, and disposal of waste, together with monitoring and regulation of the waste management process.

The supplier will develop and implement policies and procedures to minimize hazardous waste generation and risks to human health and the environment associated with hazardous waste management and disposal. The supplier will develop and implement processes and procedures for selecting licensed and qualified hazardous waste transporters, recyclers, and disposal facilities, and verify that they exercise responsible environmental management practices. Examples include not allowing open disposal to land or water.
Manufacturing operations generate many different types of waste, both hazardous and non-hazardous. This section of the Guidelines considers important concepts in the management and control of waste, including waste prevention, recycling, reuse, treatment, and disposal.
Manufacturing facilities that generate and store wastes should adopt the following practices:

- Establish waste management priorities at the outset of activities, based on an understanding of potential Environmental, Health, and Safety (EHS) risks and impacts and considering waste generation and its consequences.
- Avoid or minimize the generation of waste materials, as far as practicable.
- Where waste generation cannot be avoided, it should be minimized, recovered and/or reused.
- Where waste cannot be recovered or reused, it should be treated, destroyed, and disposed of in an environmentally sound manner.

- Establish a waste management hierarchy that prioritize prevention, reduction, reuse / recycling, recovery and finally disposal of wastes, as chart below:



Types of Waste

Solid (non-hazardous) wastes generally include any garbage or refuse, such as metal scrap and residual waste from industrial operations, such as boiler slag or fly ash.

Hazardous waste shares the properties of a hazardous material (e.g., ignitability, corrosivity, reactivity, or toxicity), or other physical, chemical, or biological characteristics that may pose a potential risk to human health or the environment if improperly managed.

Sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material from industrial operations needs to be evaluated to establish whether it constitutes a hazardous or a non-hazardous waste.

2.2. Why is Waste Management Important?

Reduce negative impact on:

Environment: By investing in responsible waste management, the environmental impact is lowered. The more waste that a business produces, the more likely it is that the waste ends up at a landfill. Landfills are known to impact air and water quality, which can have a serious impact on your local community. By reducing, reusing, and recycling your business's waste, you can help to conserve natural resources, protect the environment, and become an overall more eco-friendly and environmentally conscious company.

Health: The improper handling of different types of waste materials and shoddy disposal methods can result in serious medical conditions. If you do not follow the right kind of waste management practices, it can result in extensive air and land pollution. This can affect the health people and can give rise to respiratory problems as well. Any kind of hazardous wastes that seep into the water and soil can affect animals and plants. If humans consume these animals or plants, that can also affect our health.

Workplace Safety: Improper disposal of waste can lead to a variety of workplace safety issues. For example, overflowing trash cans are much more than an eyesore. Bad fumes and even tripping hazards are possible when waste is improperly collected and disposed of. There is the risk of improper disposing harmful chemicals and sharp objects.

Costs: How your business spends its dollars is important. One expense that often goes overlooked is trash collection and removal services. While you may assume that this is a fixed fee, generally the cost fluctuates depending on the amount and type of waste that is picked up. With a waste compaction program, you can lessen the amount of waste that your business produces. This means lower trash management costs.

Business's Reputation: Not only will a good waste management allow you to lower your business's carbon footprint and impact to our planet, but it will also have an impact on the number and type of customers that are interested in your brand. Today's consumer is very interested in not only eco-friendly products but eco-friendly companies. By doing your part with responsible environmental waste management, you can get good PR about being green and caring about the environment. This greatly enhances your business's reputation and can put your brand one step ahead of your competitors.

2.3. How to implement Waste Management?

Waste management should be handled through a waste management system that addresses issues linked to waste minimization, generation, transport, disposal, and monitoring, as described below.

2.3.1. Waste Management Planning

Facilities that generate waste should characterize their waste according to composition, source, types of wastes produced, generation rates, or according to local regulatory requirements. Effective planning and implementation of waste management strategies should include:

- Review of new waste sources during planning, siting, and design activities, including during equipment modifications and process alterations, to identify expected waste generation, pollution prevention opportunities, and necessary treatment, storage, and disposal infrastructure.
- Collection of data and information about the process and waste streams in existing facilities, including characterization of waste streams by type, quantities, and potential use/disposition.
- Establishment of priorities based on a risk analysis that considers the potential environmental risks during the waste cycle and the availability of infrastructure to manage the waste in an environmentally sound manner.
- Definition of opportunities for source reduction, as well as reuse and recycling.
- Definition of procedures and operational controls for on-site storage.
- Definition of options/procedures/operational controls for treatment and final disposal.

2.3.2. Waste Prevention

Processes should be designed and operated to prevent, or minimize, the quantities of wastes and hazards associated with the wastes generated by:

- Substituting raw materials or inputs with less hazardous or toxic materials or with those where processing generates lower waste volumes.

• Applying manufacturing processes that convert materials efficiently, providing higher product output yields, including modification of design of the production process, operating conditions, and process controls.
• Instituting good housekeeping and operating practices, including inventory control to reduce the amount of waste resulting from materials that are out-of-date, off-specification, contaminated, damaged, or excess to plant needs.
• Instituting procurement measures that recognize opportunities to return usable materials such as containers and which prevent the over-ordering of materials.
• Minimizing hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste.

2.3.3. Recycling and Reuse

In addition to the implementation of waste prevention strategies, the total amount of waste may be significantly reduced through:

• Evaluation of waste production processes and identification of potentially recyclable materials
• Identification and recycling of products that can be reintroduced into the manufacturing process
• Investigation of external markets for recycling by other industrial processing operations
• Establishing recycling objectives and formal tracking of waste generation and recycling rates
• Providing training and incentives to employees in order to meet objectives.

2.3.4. Treatment and Disposal

If waste materials are still generated after the implementation of feasible waste prevention, reduction, reuse, recovery and recycling measures, waste materials should be treated and disposed of, and all measures be taken to avoid potential impacts to human health and the environment. Onsite incineration is not allowed. Selected management approaches should be consistent with the characteristics of waste and local regulations and may include:

• On-site or off-site biological, chemical, or physical treatment of the waste material to render it non-hazardous prior to final disposal
• Treatment or disposal at permitted facilities specially designed to receive the waste.

Disposal of waste should be secured using formal procurement agreements with qualified waste vendors who have the required permits, certifications, and approvals from government.

2.3.5. Transportation

On-site and off-site transportation of waste should be conducted to prevent or minimize spills, releases and exposures to employees and the public. All waste containers designated for off-site shipment should be secured and labelled with the contents and associated hazards, be properly loaded on the transport vehicles before leaving the site and be accompanied by a shipping paper (e. g., manifest) that describes the load and its associated hazards.

2.3.6. Hazardous Waste Management

Hazardous wastes should always be segregated from non-hazardous wastes. If the generation of hazardous waste cannot be prevented, then management should focus on the prevention of harm to health, safety, and the environment, according to the following principles:

- Understanding potential impacts and risks associated with the hazardous waste over its complete life cycle
- Ensuring that contractors handling, treating, and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice for the waste being handled
- Ensuring compliance with applicable local and international regulations.

It is noted that hazardous waste materials can be generated in relatively small quantities, including spent solvents and oily rags, empty paint cans, chemical containers, used lubricating oil, used batteries and lighting equipment. These wastes should also be managed according to the above principles.

2.3.7. Waste Storage

Hazardous waste should be stored to prevent or control accidental releases to air, soil, and water resources. As a minimum, suppliers should:

- Store waste in a manner that prevents the commingling or contact between incompatible wastes and allows for inspection between containers to monitor leaks or spills
- Store in closed containers away from direct sunlight, wind, and rain
- Avoid underground storage tanks and underground piping of hazardous waste.

Hazardous waste storage activities should be subject to special management actions, conducted by employees who have received specific training in handling and storage of hazardous wastes. Also spill response and emergency plans must be in place to address their accidental release.

2.3.8. Monitoring

Monitoring activities associated with the management of hazardous and non-hazardous waste should include regular visual inspections of all waste storage collection and storage areas for evidence of accidental releases and to verify that wastes are properly labelled and stored.

Regular audits of waste segregation and collection practices should include:

- Tracking of waste generation trends by type and amount of waste generated
- Characterizing waste at the beginning of generation of a new waste stream and periodically documenting the characteristics and proper management of the waste, especially hazardous wastes
- Keeping manifests or other records that document the amount of waste generated and its destination
- Periodic auditing of third-party treatment and disposal services including reuse and recycling facilities when significant quantities of hazardous wastes are managed by third parties
- Regular monitoring of groundwater quality in case of waste on-site storage and/or pre-treatment and disposal of hazardous water

When significant quantities of hazardous wastes are generated and stored on site, monitoring activities should include:

- Inspection of vessels for leaks, drips, or other indications of loss
- Identification of cracks, corrosion or damage to tanks, protective equipment, or floors
- Verification of locks, emergency valves and other safety devices for easy operation
- Checking the operability of emergency systems
- Documenting results of testing for integrity, emissions, or monitoring stations
- Documenting any changes to the storage facility, and any significant changes in the quantity of materials in storage.

Monitoring records for hazardous waste collected, stored, or shipped should include:

- Name and identification number of the material(s) composing the hazardous waste
- Physical state (i.e., solid, liquid, gaseous or a combination of one, or more, of these)
- Quantity (e.g., kilograms or liters, number of containers)
- Waste shipment tracking documentation to include quantity and type, date dispatched, date transported, and date received, record of originator, recipient, and transporter
- Method and date of storing, repacking, treating, or disposing at the facility, cross-referenced to specific manifest document numbers applicable to the hazardous waste
- Location of each hazardous waste within the facility and the quantity at each location.

Further information & guidance:
- European Commission – Waste Framework Directive

3. AIR EMISSIONS

3.1. What are Air Emissions?

Emissions of air pollutants can occur from a wide variety of industrial activities and can come from a single source (e.g., a flue or stack from a boiler or furnace) or from multiple sources (e.g., the application of solvents in a production line). Wherever possible, suppliers should avoid, minimize, and control adverse impacts of air emissions on human health, safety, and the environment. The supplier will make sure that air emissions are characterized, routinely monitored, controlled, and treated according to the legal requirements and accepted industry standards.

3.1.1. Air Quality Standards and Testing

Factories with significant sources of air emissions and potential for significant impacts on air quality should prevent or minimize impacts by ensuring that emissions do not reach or exceed relevant local or national air quality standards, or in their absence of such standards, the current World Health Organization's (WHO) Air Quality Guidelines or other internationally recognized guidance.

To ensure compliance with the applicable local or national standards, air emissions should be regularly monitored, and samples tested in government-approved laboratories.

3.1.2. Point sources

Point sources are discrete, stationary, identifiable sources of emissions that release pollutants to the atmosphere. They are typically associated with the combustion of fossil fuels, which may result in the release of air pollutants such as nitrogen oxides (NOx), sulfur dioxide (SO2), carbon monoxide (CO), and particulate matter (PM), but may also include other air pollutants depending on the industrial processes involved.

3.1.3. Fugitive Sources

Fugitive source air emissions refer to emissions that are distributed spatially over a wide area and are not confined to a specific discharge point. The two main types of fugitive emissions are Volatile Organic Compounds (VOCs) and particulate matter (PM). Factories with potentially significant fugitive sources of emissions must carry out regular ambient quality testing as part of their monitoring practices.

Open burning of solid wastes, whether hazardous or non-hazardous, is not a good practice and should be avoided.

Volatile Organic Compounds (VOCs)

The most common sources of fugitive VOC emissions are associated with industrial activities that produce, store, and use VOC-containing liquids or gases where the material is under pressure, exposed to a lower vapour pressure or displaced from an enclosed space. Typical sources include equipment leaks, open vats and mixing tanks, storage tanks, unit operations in wastewater treatment systems and accidental releases.

Equipment leaks include valves, fittings and elbows which are subject to leaks under pressure. The recommended prevention and control techniques for VOC emissions associated with equipment leaks include equipment modifications and implementing a leak detection and repair (LDAR) program by regularly monitoring to detect leaks and implementing repairs within a pre-defined time period.

Particulate Matter (PM)

The most common pollutant involved in fugitive emissions is dust or particulate matter (PM). This may be released as a by-product of certain industrial operations such as grinding and milling, or the transport and open storage of solid materials, or from exposed soil surfaces, including unpaved roads.

Recommended prevention and control of these emissions sources include:

- Use of dust control methods such as covers, water suppression or increased moisture content for open material storage piles
- Use of air extraction and treatment through a baghouse or cyclone for material handling sources such as conveyors and bins.

Operators responsible for cleaning and disposing of dust and baghouse waste should be provided with the proper safety training and PPE (Personal Protective Equipment), i.e., apron, head cover and mask. All residues should be properly and safely disposed of to an authorized waste facility.

Ozone Depleting Substances (ODSs)

Several chemicals are classified as ozone depleting substances (ODSs) and are scheduled for phase-out under the Montreal Protocol on Substances that Deplete the Ozone Layer. No new systems or processes should be installed using CFCs, halons, 1,1,1-trichloroethane, carbon tetrachloride, methyl bromide or hydrobromofluorocarbons (HBFCs). HBFCs should only be considered as interim/bridging alternatives as determined by the host country commitments and regulations.

3.2. Why is Preventing & Controlling Air Emissions Important?

Air emissions can endanger both human health and the biosphere. Air emissions also have an impact on the surface of materials and can affect the climate. The emission of atmospheric pollutants can be caused both naturally (e.g., as a result of volcanic eruptions, forest fires, sandstorms, pollination etc.) and anthropogenically. Once released into the atmosphere, Air emissions can be transported over huge distances to the site of impact, depending in each case on meteorological conditions and reactivity. There, they act as a primary pollutant or, due to chemical and physical transformation during dissemination, as a secondary pollutant. Atmospheric pollutants can also both be discharged from the lowest layer of the atmosphere into higher layers and can enter the lowest layer from higher layers. Reducing pollutants in the air is important for human health and the environment. Poor air quality has harmful effects on human health, particularly the respiratory and cardiovascular systems. Pollutants can also damage plants and buildings, and smoke or haze can reduce

visibility. Significant sources of emissions of atmospheric pollutants are industrial plants, combustion plants burning fossil energy sources to produce electricity and heat, air, land or sea transport, and different agricultural systems and processes.

3.3. How to Prevent and Control Air Emissions?

Emissions from point sources should be avoided and controlled through the combined application of process modifications and emissions controls, including the proper design of the stack height. The stack height should be designed to avoid excessive ground level concentrations due to downwash, wake, and eddy effects, and to ensure reasonable diffusion to minimize impacts. For factories where there are multiple sources of emissions, stack heights should consider emissions from all other sources.

For VOC emissions associated with handling of chemicals in open vats and mixing processes, the recommended prevention and control techniques include:

- Substitution of less volatile substances, such as water-based solvents
- Collection of vapors through air extractors and subsequent treatment of gas stream by removing VOCs with control devices such as condensers or activated carbon absorption
- Collection of vapors through air extractors and subsequent treatment with destructive control devices, for example, catalytic incinerators which reduce VOCs from process exhaust gases exiting paint spray booths, ovens, and other process operations
- Use of floating roofs on storage tanks to reduce the opportunity for volatilization by eliminating the headspace present in conventional storage tanks.

Recommended prevention and control of **particulate matter emissions sources** include:

- Use of dust control methods such as covers, water suppression or increased moisture content for open material storage piles
- Use of air extraction and treatment through a baghouse or cyclone for material handling sources such as conveyors and bins.

Operators responsible for cleaning and disposing of dust and baghouse waste should be provided with the proper safety training and PPE (Personal Protective Equipment), i.e., apron, head cover and mask. All residues should be properly and safely disposed of to an authorized waste facility.

What are general Steps in Developing a Control Strategy?

1. Determine priority pollutants. The pollutants of concern for a specific location will be based on the nature of the associated health or environmental effects and the severity of the air quality problem in that area.
2. Identify measures to control sources of pollution.
3. Develop a control strategy and plan that incorporates the control measures. The written plan should include implementation dates. The plan will need to reference the requirements that owners or operators of emission sources will need to undertake to reduce pollution contributing to the air quality problems.
4. Involve the public. Invite input from the regulated community and others, including the general public when developing the control strategy. This early consultation reduces later challenges and can help streamline implementation.

5. Include compliance and enforcement programs. These programs are very important to include and help owners or operators of sources understand the requirements, as well as the actions that environmental authorities can take if the sources don't comply.

Further information & guidance:

• ZDHC Air Emissions Position Paper

4. Climate Change

4.1. What is humanmade Climate change?

Climate change, also called global warming, refers to the rise in average surface temperatures on Earth. An overwhelming scientific consensus maintains that climate change is due primarily to the human use of fossil fuels, which releases carbon dioxide and other greenhouse gases into the air. The gases trap heat within the atmosphere, which can have a range of effects on ecosystems, including rising sea levels, severe weather events, and droughts that render landscapes more susceptible to wildfires.

4.2. Why does reducing Greenhouse Gas Emissions matter?

Even small increases in Earth's temperature caused by climate change can have severe effects. The earth's average temperature has gone up 1.4° F over the past century and is expected to rise as much as 11.5° F over the next. That might not seem like a lot, but the average temperature during the last Ice Age was about 4° F lower than it is today.

Rising sea levels due to the melting of the polar ice caps (again, caused by climate change) contribute to greater storm damage; warming ocean temperatures are associated with stronger and more frequent storms; additional rainfall, particularly during severe weather events, leads to flooding and other damage; an increase in the incidence and severity of wildfires threatens habitats, homes, and lives; and heat waves contribute to human deaths and other consequences.

Therefore, we are committed to reduce greenhouse gas emissions that are within our scope of responsibility so that we are compliant with the 1.5° target of the Paris Climate Agreement[1]. The supplier will demonstrate a consistent and competent approach to GHG (greenhouse gas) emissions management at facilities. Efforts to quantify, track and report GHG emissions will be consistent with best practices and international standards.

deuter supports the sustainable use of materials and the conservation of natural resources. We recognize that uncontrolled consumption of resources may have dire implications for local communities and for the planet. We are therefore committed to act wherever we have direct influence – in the design of our products and in the selection of materials – and where we see measurable adverse impacts from the manufacture and transportation of our goods. We expect our suppliers and supplier partners to be aligned with globally agreed policies and frameworks for sustainable

[1] United Nations – The Paris Agreement
https://unfccc.int/sites/default/files/resource/parisagreement_publication.pdf

resource use and have a strategy in place for a stepwise improvement in their efficiency, with specific measures to reduce their:

- Energy consumption, with a primary focus on energy efficiency
- Carbon emissions and associated impacts on greenhouse gases (GHG)

More detailed guidance is given below.

4.3. How to reduce Greenhouse Gas Emissions?

Industrial facilities and processes have high potential to contribute to global warming through the emissions of greenhouse gases (GHGs). Of most concern are emissions of what are known as "long-lived" greenhouse gases, the most important of which are CO2, methane, nitrous oxide, and CFC gases[2]. A decade ago, countries came together to sign an international treaty:

- 1994 United Nations Framework Convention on Climate Change
- The Kyoto Protocol entered into force on February 16, 2005, but expired in 2012

Sustained reduction in GHGs is essential to keep global warming to be held below the 1.5-degree threshold.
For manufacturing operations, greenhouse gases may be generated from direct emissions from facilities within the physical boundary of the site and from indirect emissions associated with the off-site production of power used by those facilities. Recommendations for the reduction and control of greenhouse gases include:

- Enhancement of energy efficiency
- Protection and enhancement of sinks and reservoirs of greenhouse gases, e.g., through reforestation
- Development and adoption of renewable forms of energy, both on-site and as an off-site energy source.

4.3.1. Energy Management Programs

Manufacturing facilities consume energy in process heating and cooling; process and auxiliary systems, such as motors, pumps, and fans; compressed air systems and heating, ventilation, and air conditioning systems (HVAC); lighting systems. Energy management at the facility level should be viewed in the context of overall consumption patterns, including those associated with production processes and supporting utilities, as well as overall impacts associated with emissions from power sources.

Energy management programs should include the following elements: Energy management programs should include the following elements:

- Identification, and regular measurement and reporting of principal energy flows within a facility at unit process level
- Preparation of mass and energy balance
- Definition and regular review of energy performance targets which are adjusted to account for changes in major influencing factors on energy use

[2] The six greenhouse gases that form part of the Kyoto Protocol to the United Nations Framework Convention on Climate Change include carbon dioxide (CO2); methane (CH4); nitrous oxide (N2O); hydrofluorocarbons (HFCs); perfluorocarbons (PFCs); and sulfur hexafluoride (SF6).

• Regular comparison and monitoring of energy flows with performance targets to identify where action should be taken to reduce energy use
• Regular review of targets, which may include comparison with benchmark data, to confirm that targets are set at appropriate levels.
• Identification, and regular measurement and reporting of principal energy flows within a facility at unit process level
• Preparation of mass and energy balance
• Definition and regular review of energy performance targets which are adjusted to account for changes in major influencing factors on energy use
• Regular comparison and monitoring of energy flows with performance targets to identify where action should be taken to reduce energy use
• Regular review of targets, which may include comparison with benchmark data, to confirm that targets are set at appropriate levels.

4.3.2. Energy Efficiency

For any energy-using system, a systematic analysis of energy efficiency improvements and cost reduction opportunities should include a hierarchical examination of opportunities to:

• Demand/Load Side Management by reducing loads on the energy system, and
• Supply Side Management by:
    o Reducing losses in energy distribution
    o Improving energy conversion efficiency
    o Exploiting energy purchasing opportunities
    o Using lower-carbon fuels.

4.3.3. Green Buildings

'Green buildings' refer to the use of environmentally preferable practices and materials in the design, location, construction, operation, and disposal of buildings. It applies to both renovation and retrofitting of existing buildings and construction of new buildings. Many countries have developed their own standards for green buildings, examples include:

• USA: The Leadership in Energy and Environmental Design (LEED) Green Building Rating System, developed by the US Green Building Council (USGBC), provides a suite of standards for environmentally sustainable construction. See http://www.usgbc.org/
• Germany: The German Association for Sustainable Building (DGNB) has developed a quality certification for buildings with five sustainability criteria. See www.dgnb.de
• United Kingdom: The British Research Establishment Environmental Assessment Methodology (BREEAM) is the most widely used international method for assessing building quality and performance in terms of energy, environmental impact, and health indicators. See http://www.breeam.org/ and http://www.thegreenguide.org.uk/

In designing and constructing new buildings, supplier partners are strongly encouraged to adopt green building practices, following the guidance given above.

Benefits of Green Buildings		
Environmental benefits:	**Economic benefits:**	**Health and community benefits:**

• Enhance and protect ecosystems and biodiversity • Improve air and water quality • Reduce solid waste • Conserve natural resources	• Reduce operating costs • Enhance asset value and profits • Improve employee productivity and satisfaction • Optimize life cycle economic performance	• Improve air, thermal, and acoustic environments • Enhance occupant comfort and health • Minimize strain on local infrastructure • Contribute to overall quality of life

4.3.4. Renewable Energy Adoption

Transition to clean and renewable energy is not only to decrease the carbon emission but also to decouple from fossil fuel dependence. There are few applicable on-/off-site renewable energy opportunities in deuter's supply chain:

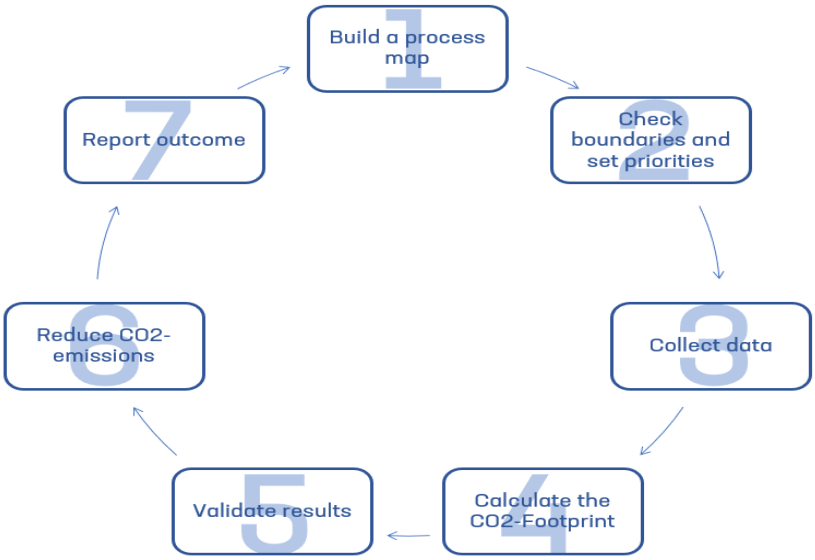
- Solar photovoltaic system
- Biomass boiler
- Virtual power purchase agreement (VPPA)

Since the technology is changing rapidly, facility can consider the feasibility of adoption in long term to get the full benefit of renewable energy investment.

4.3.5. Carbon Footprint

'Carbon footprint' is a term used to describe the amount of GHG emissions caused by an activity or a facility, and therefore a way for businesses to assess their contribution to climate change. Understanding GHG emissions and where they come from is necessary to reduce them.

Supply chain GHG emissions, which include those associated processes not controlled by deuter directly, can be measured at the manufacturing facilities level. Suppliers' reported energy consumption and GHG emission conversion factors (primarily GHG protocol) can be used to map out the supply chain carbon footprints. Below seven essential steps summarized the methodology for carbon footprint calculation:



As a minimum, deuter partners must comply with the GHGs reduction and energy efficiency targets given by deuter or established for their industry in the countries where they operate whichever.

Further information & guidance:

E-Learning Climate Action
There is a comprehensive E-learning course for climate action freely available at the atingi platform. **We highly recommend using this easy to access platform!** There are different interesting learning methods like Videos, presentations, and quizzes. It is not necessary to do the whole eLearning course, you can also pick the topics of need and complete these modules. The E-Learning covers the topics:
1 - Why Climate Action Matters
2 - GHG emissions
3 - GHG Accounting
4 - Target Setting
5 - Energy Efficiency Measures & Renewable Energy & Biomass
These steps must be taken:

1. Open https://www.atingi.org/
2. Register on the platform
3. Search the course "**Climate action training for the fashion industry (self-paced)**"
4. Enroll to the course and complete all modules or just the modules you are interested in.

- Greenhouse gas Protocol
- UNFCCC - Fashion Industry Charter for Climate Action

5. BIODIVERSITY

5.1. What is Biodiversity?

Biodiversity is the biological variety and variability of life on earth. It refers to:

- Species diversity, which is the diversity within different plant and animal species
- Habitat diversity, which is the diversity of all habitats
- Genetic diversity, which is the diversity within individual species that serves as a way for populations to adapt to changing environments making them more likely to survive

5.2. Why is it important?

The dramatic loss of biodiversity is a big threat to humanity. In its Living Planet Report, the WWF has measured a 58 percent decline in animal populations over the past forty years. Over 14000 animal populations studied have more than halved.

But human survival heavily depends on functioning ecosystems and intact nature, whether fertile soil, clean water, or fresh air. The earth is still providing these "ecosystem services", such as:

- Food such as cereals, vegetables and fruits depend on a high variety of pollinating insects
- Renewable raw materials such as wood and oil plants or fibers such as cotton have invaluable economic value
- Medicinal substances from plants have the potential to combat previously incurable diseases
- The potential for innovations based on natures technologies is huge (bionics)

The main reasons for the loss of biodiversity are:

- **Habitat loss and degradation:** largest single source of pressure on biodiversity. Habitat loss is the direct conversion of natural habitats for human uses, and degradation - the direct alteration or fragmentation of natural habitats for human uses
- **Overexploitation of biological resources**, the harvest and consumption of wild population of animals, plants, fungi, and microorganisms at an unsustainable rate
- **Hybridization** and **genetic erosion** have the potential to destroy unique genotypes. A decrease in genetic diversity weakens the ability of crops and livestock to resist disease and survive changes in the environment
- **Pollution,** the presence, or introduction into the environment of a substance with harmful or poisonous effects.
- **Climate change** is a major threat to global biodiversity. Increasing atmospheric CO2 concentration certainly effects plant morphology and is acidifying oceans, and temperature affects species ranges, phenology, and weather.
- **Introduced and invasive species;** They breach natural barriers and occupy new territory often supplanting native species by occupying their niches, or by using resources that usually sustain native species

• **Human overpopulation,** according to a study of the WWF, the global human population already exceeds the planet's biocapacity.

5.3. How to conserve biodiversity?

1. Understand when there are high risks of negatively impacting biodiversity
2. Clearly define your commitments in relation to nature conservation. Commitments that likely match risks in the apparel sector:
    - Move to deforestation-free supply chains
    - Promote land restoration
    - Substitute more hazardous chemicals with less hazardous ones
    - Sustainable water management
    - Contribute to sustainable livelihoods
3. Integrate credible certification schemes in your supply chain
4. Distinguish between animal welfare and biodiversity conservation issues
5. Integrate sustainability in the conceptual phase of the business development
6. Develop and implement a sustainable use strategy relating to wildlife resources

Further information & guidance:

• IUCN - Biodiversity Risks and Opportunities in the Apparel Sector

6. ANIMAL WELFARE

6.1. What is animal welfare?

Animal welfare generally refers to the quality of an animal's life as it is experienced by an individual animal. At any time, an animal's welfare is influenced by many factors as genetics, previous experience, physiological state, and psychological state. The five freedoms are each needed in combination for good animal welfare:

1. **Freedom from hunger and thirst** by ready access to fresh water and diet to maintain health and vigor. This must be specific to the animal. For example, puppies, adult dogs, pregnant cats, and senior cats all need different types of food provided on different schedules.
2. **Freedom from discomfort** by providing an appropriate environment including shelter and a comfortable resting area. This means you should provide soft bedding and an area with appropriate temperature, noise levels, and access to natural light. If an animal is outside, it must have shelter from the elements as well as appropriate food and water bowls that will not freeze or tip over.
3. **Freedom from pain, injury, or disease** by prevention or rapid diagnosis and treatment. This includes vaccinating animals, monitoring animals, physical health, treating any injuries and providing appropriate medications.
4. **Freedom to express normal behavior** by providing sufficient space, proper facilities, and company of the animal's own kind. Animals need to be able to interact with – or avoid – others of their own kind as desired. They must be able to stretch every part of their body (from nose to tail), and run, jump, and play. This can be particularly challenging when animals are housed in individual kennels.
5. **Freedom from fear and distress** by ensuring conditions and treatment which avoid mental suffering. The mental health of an animal is just as important as its physical health – as psychological stress can quickly transition into physical illness. These conditions can be achieved by preventing overcrowding and providing sufficient enrichment and safe hiding spaces.

Embracing the Five Freedoms supports the health and welfare of the animals in our care and provides adopters with the best possible insight into their personalities. That ultimately leads to more animals successfully placed in loving homes.

6.2. Why is it important?

Animal Welfare is important because there are so many animals around the world suffering from being used for entertainment, food, medicine, fashion, scientific advancement, and exotic pets. Every animal deserves to have a good life where they can enjoy the benefits of the five Freedoms (behavior, nutrition, environment, health, mental state)

6.3. How to ensure animal welfare?

Everywhere it is possible deuter renounces animal products. Where this is not possible, animal welfare must be respected. Likewise, progressive efforts must be made to establish humane and healthy practices towards animals based on the best available technologies and standards.

To ensure animal welfare is respected, we only allow the usage of RDS certified down. The whole supply chain must be certified, and transaction certificates must be available.

Further information:

https://textileexchange.org/standards/responsible-down/#tools