Solidaridad

Wet Processing Guidebook

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Wet Processing Guidebook

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Introduction to Guidebook

Background
One of the nine themes of the Dutch Agreement for Sustainable Garments and Textiles is water pollution and use of chemicals, water and energy.

Challenges
- The availability of sufficient clean water is regarded as one of the major problems to be faced in the near future.
- The large quantities of chemicals used in the dyeing, printing and washing processes to give textiles and garments the appearance and "handfeel" that consumers want, are major sources of water pollution in many production countries.
- The industry often uses large amounts of energy in the above processes.
- While there are local legislations, these regulations are regularly circumvented and not enforced.

Consequences
- Environmental pollution in textile clusters have a major adverse impact on the local population, agriculture and other "water users".
- Uncontrolled use of chemicals in the production or supply chain can result in undesired residues in the end product, such as those regulated in REACH.

How will this guide help?
There are many areas where environmental impacts can be addressed throughout a garment's value chain; from growing or producing fibres, spinning and weaving processes, wet processes such as dyeing and washing, cut and trim, all the way to how the consumer takes care of the garment.

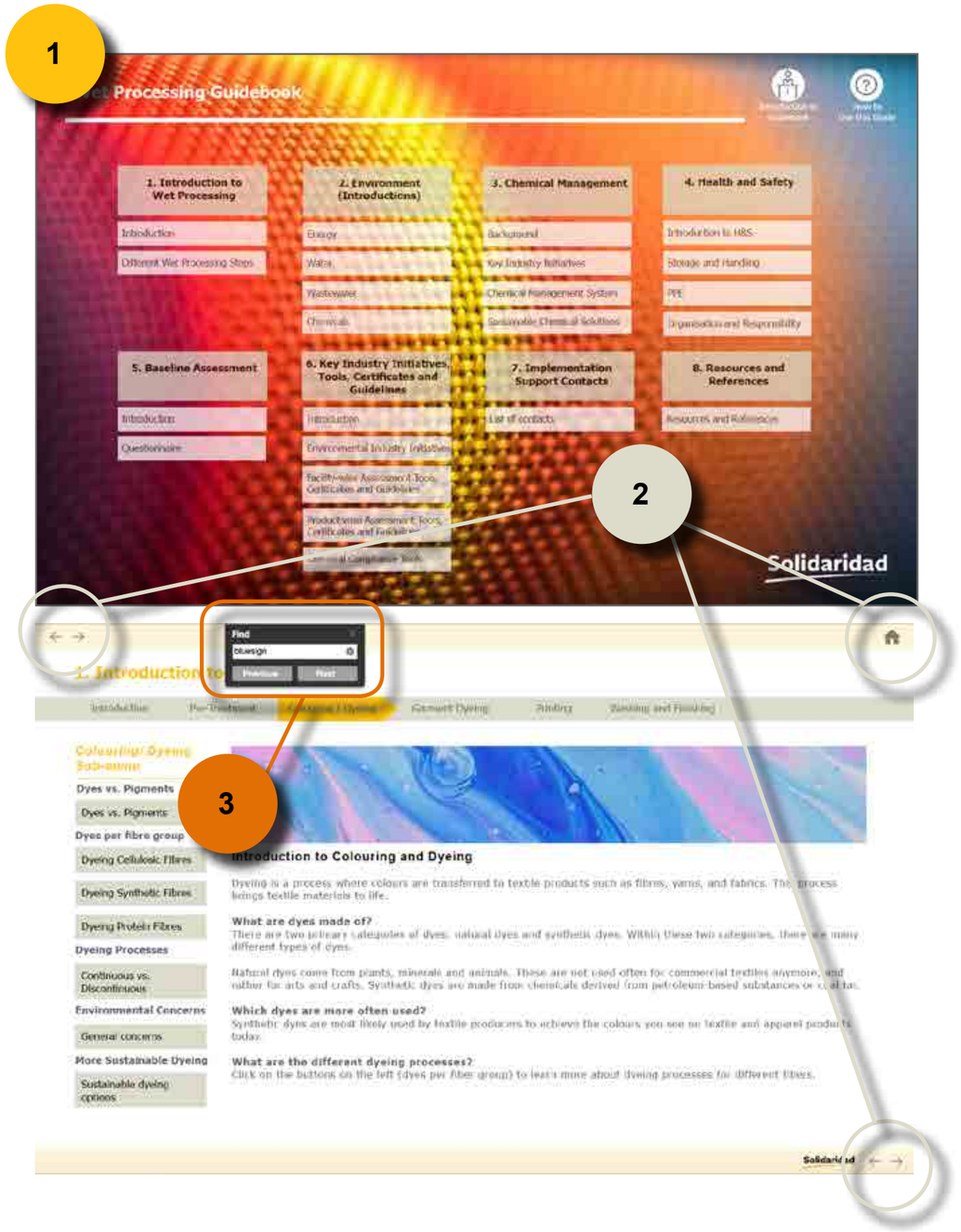
When it comes to making a difference towards water pollution, use of chemicals, water and energy impacts as a brand/retailer, the biggest influences lie in two areas;
- The type of materials used (e.g. organic vs. conventional cotton, or recycled polyester vs. virgin polyester)
- How the materials are processed during wet processing (e.g. how much water is used and types of chemicals used)

This guide focuses on wet processing aspects only
The guide will provide insights to;
- What is wet processing
- What are the different environmental impacts caused by wet processing
- How chemicals should be managed at a wet processing facility
- Health and safety expectations at a wet processing facility

Basic assessment
This guide will also provide a way to make a basic assessment at a wet processing facility, and make a judgment on how well equipped the facility is in terms of handling wet processes in the most sustainable way.

References and Contacts
- **Tools:** There are many tools available (both paid or free to public) listed in this guide
- **Initiatives:** There are also many industry initiatives available that are good to know about listed in this guide
- **Implementation partners:** Since this is a beginners guide to wet processes, technical or implementation help might be needed to provide sufficient help/ support to your wet processing vendors. A list of implementation partners are also listed in this guide.

How to use this guidebook



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Navigation:

1 **Key components** of the guideline are found on the home page.

2 **Back, forward and home buttons:** The back and forward buttons are located top left and bottom right of the content pages. The home button is located top right of the content pages. When pages are jumped, the back button takes you back to the last viewed page.

3 **Other ways to search for information:** Other than using the main menu, you may utilize the search function in the PDF viewer and type in key words to find information e.g. 'bluesign'.

TIPS:

- **All tips are highlighted in blue.**
- **Web links:** A link without an icon such as 'Learn more here', it is a hyperlink to an external website.
- **Info Pop-ups:** A link with this icon '👁', is a pop up that contains more information and/ visuals about the link.
- **Jump chapters:** A link with this icon '↪' will allow you to jump to a related chapter within this guidebook. To go back, simply click on the '←' button at the top or bottom of your screen.
- **Media links:** A link with this icon '▶', is a hyperlink to a website with a video.

1. Introduction to Wet Processing

Introduction

Textile wet processing, which includes pre-treatment, coloration/ dyeing, printing, washing and finishing, is a crucial stage in textile manufacturing.

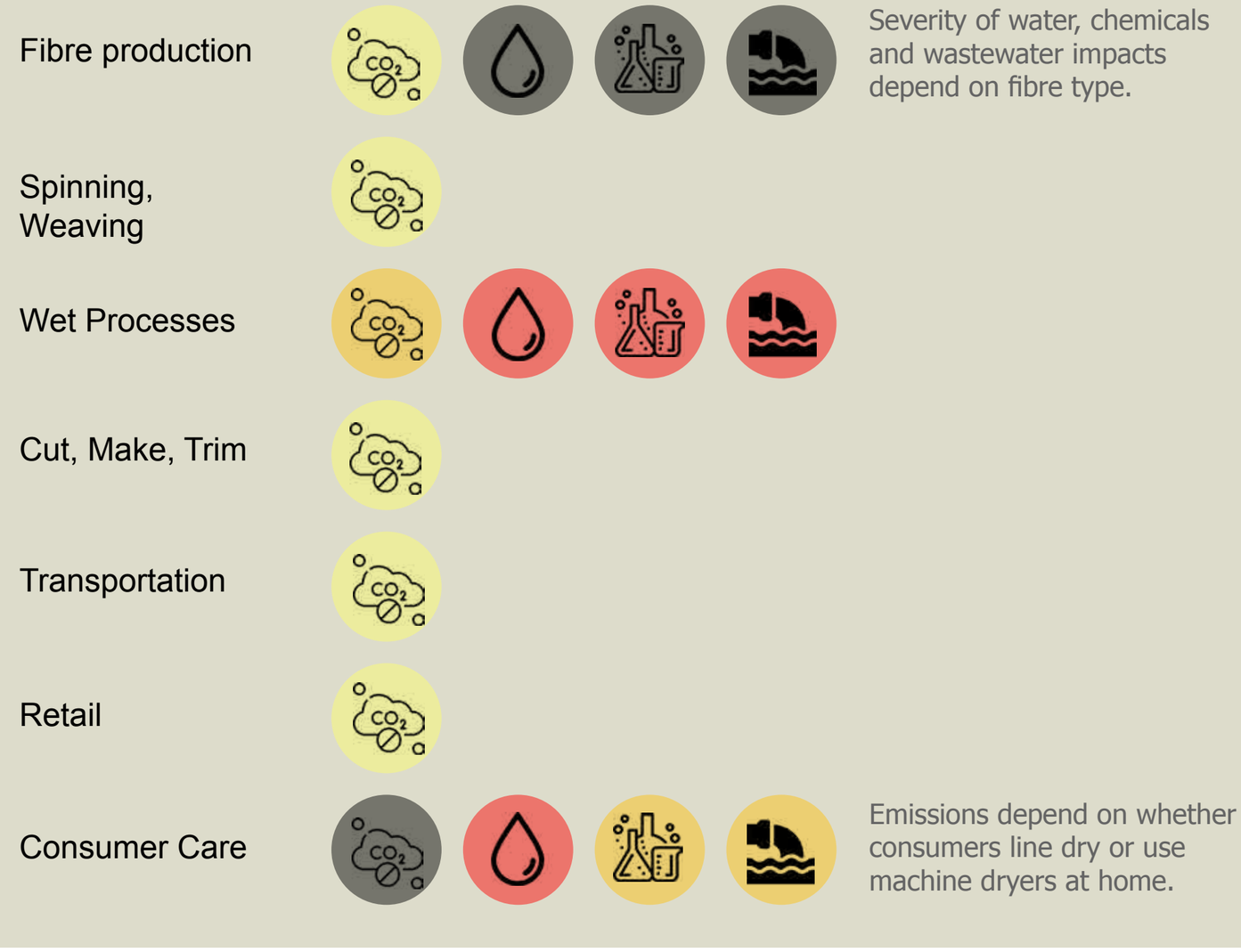
The different wet processing steps are responsible for allowing textile products achieve a specific look, feel and function.

Environmental concerns
Over the years, the textile industry has been in the spotlight for using vast amount of natural resources, fresh water, energy, and chemicals, while producing waste, and polluting local waterways at manufacturing countries with hazardous wastewater.

In order to overcome the overall environmental impact, many steps can be taken place to reduce water use, energy use and avoid or control hazardous chemicals from being released into the environment.

This section of the guidebook will walk you through the different textile wet process stages, with highlights on different environmental concerns per step, and introductions to more sustainable options and alternatives.

Environmental concerns across the textile value chain



1. Introduction to Wet Processing

Pre-Treatment

Pre-treatment processes are carried out to prepare the textile materials for dyeing and other subsequent processing.

Main goal is to create uniform textile properties like water uptake and a uniform colour.

Pre-treatment processes include (not limited to):

- Sizing (definition) (video)
- De-sizing (definition)
- Scouring (definition)
- Bleaching (definition)
- Mercerising (definition)

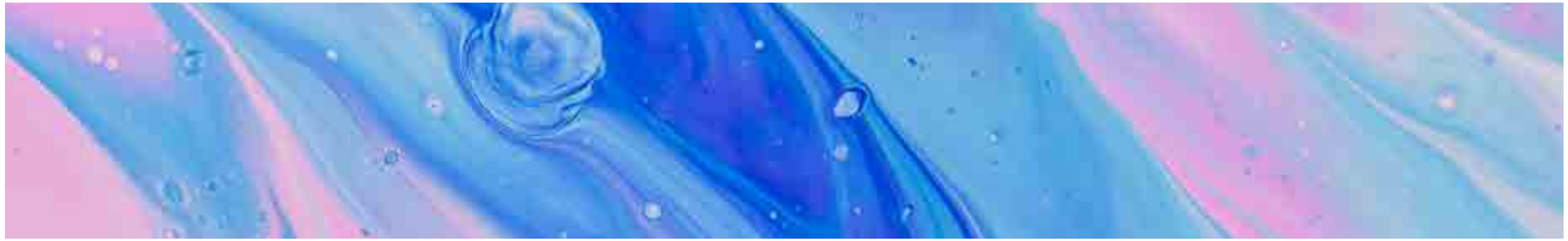
Hazardous chemicals concerns during pre-treatment:

- AP/ APEO can be found in pre-treatment processes (learn more here)
- PCPs can be used as a preservative in starch size (learn more here)

More sustainable pre-treatment options

Enzymes can be used for bio-scouring and bio-bleaching.
(learn more here)

1. Introduction to Wet Processing



Introduction to Colouring and Dyeing

Dyeing is a process where colours are transferred to textile products such as fibres, yarns, and fabrics. This process brings textile materials to life.

What are dyes made of?
There are two primary categories of dyes; natural dyes and synthetic dyes. Within these two categories, there are many different types of dyes.

Natural dyes come from plants, minerals and animals. These are not used often for commercial textiles anymore, and rather for arts and crafts. Synthetic dyes are made from chemicals derived from petroleum-based substances or coal tar.

Which dyes are more often used?
Synthetic dyes are most likely used by textile producers to achieve the colours you see on textile and apparel products today.

What are the different dyeing processes?
Click on the buttons on the left (dyes per fiber group) to learn more about dyeing processes for different fibers.

Dyes vs. Pigments

The primary purpose of applying dyes and pigments are to add colour to materials. Typically, dyes are soluble in mediums like water, whereas pigments must be converted into coarser powder after which it is mixed with dispersing agents before application.

	
Generally used for dyeing	Generally used for printing
Colour fastness generally average to excellent	Colour fastness is average to good
Its application method is comparatively more easy	Need binder for application
Dyes are typically more expensive than pigments	Pigments are generally less expensive than dyes
Dyes have attraction to fibres	Pigments have no attraction to fibres (need binder)
Applies selectively on textile materials	All fibres can be coloured with pigments

1. Introduction to Wet Processing

Dyeing Cellulosic Fibers:

Cellulosic fibers are fibers made with ethers or esters of cellulose, which can be obtained from the bark, wood, or leaves of plants, or from plant-based materials.
There are two types of cellulosic fibers; natural and synthetic.

Examples of natural cellulosic fibers: Cotton and Linen, typically minimally processed.

Examples of synthetic cellulosic fibers: Viscose (Tencel is a branded example of Viscose), model and lyocell. These are often called MMCFs (Man-made cellulosic fibers). They are made by taking natural materials such as wood bark from trees e.g. Beech, Pine, Eucalyptus and using chemical processes to transform wood chips into cotton like silky fibres.

Methods for dyeing cellulosic fibers include the use of:

- Reactive Dyes (definition)
- Direct Dyes (definition)
- VAT dyes (definition)
- Indigo Dyes (definition)
- Sulphur dyes (definition)

Image source: Tencel

Dyeing Synthetic Fibres

Synthetic fibers are made of synthetic materials, usually formed through chemical processes. The fibers are generally extracted during the chemical process using a spinneret, which is a device that takes polymers to form fibers. The textile industry began creating synthetic fibers as cheaper and more easily mass-produced alternatives to natural fibers.

Examples of Synthetic Fibers

Most synthetic fibers are petroleum derived, e.g. polyester, nylon and acrylic.

Dyeing Synthetic Fibers

Methods for dyeing cellulosic fibers include the use of:
Basic dyes (👁 definition)
Disperse dyes (👁 definition)
Acid dyes (👁 definition)

1. Introduction to Wet Processing

Dyeing Protein Fibers

Protein fibers include any materials that come from animals.

Examples of protein fibers
Protein fibers include (not limited to) wool, cashmere, alpaca, feathers, mohair, silk and angora.

Dyeing protein fibers
Acid dyes are most commonly used on wool (👁 definition)

Other dyes include:
- Metal complex dyes (👁 definition)
- Chrome dyes (👁 definition)
- Reactive dyes (👁 definition)

Continuous vs. Discontinuous

Protein fibers include any materials that come from animals.

Discontinuous	Continuous
Scoured in rope form	Scoured in open width form
Suitable for smaller order	Suitable for larger orders
Uneconomical for large orders	Economical for large orders
Examples of machinery include open and closed jigger for natural materials, jet dyeing machine, and beam package for yarn dye.	Cold Pad Batch dyeing is a sustainable continuous dyeing method where high fixation rate can be achieved with no thermal energy needed. VAT dyeing is also continuous.
Uses salt for colour fixation	No need to use salt (for colour fixation), and uses time instead
Colour correctness can be checked during process	Colour correctness cannot be checked during process

Continuous example: Cold pad batch dyeing

Image source: Erbatech

Discontinuous: Jigger machine

Image source: Turan Özmen

Discontinuous: Jet dyeing

Image source: Machinio

General Environmental Concerns

Vast amounts of water and energy is used during coloring and dyeing processes.

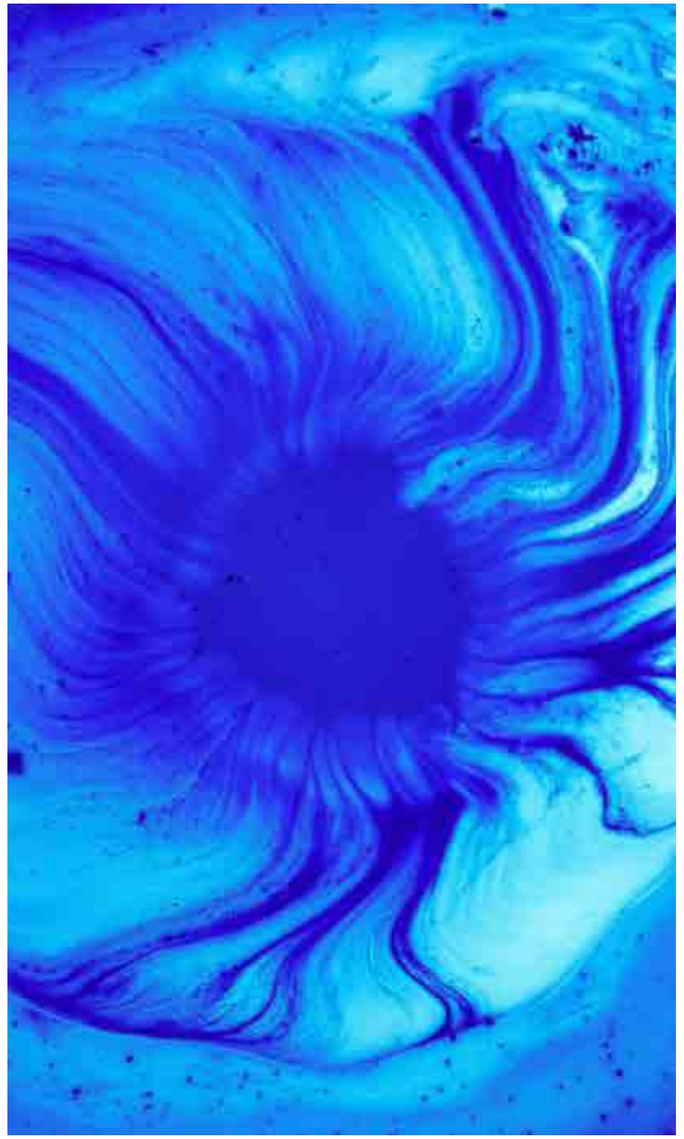
There are many ways where water and energy use can be reduced such as selection of dyeing methods such as Cold Pad Batch (covered previously where thermal energy is not required and using advanced chemistry (see sustainable dyeing options).

The key concern still lies upon the use of chemistry, and the effluent that becomes discharged. Hazardous chemicals should be avoided or restricted (information on the right).

Hazardous chemicals concerns:
The following are examples of restricted/ banned substance groups can be found during coloring and dyeing processes.

- Alkyl phenols (AP) and Alkylphenol ethoxylates (APEO)
- Banned Azo Dyes
- Chlorobenzenes
- Chlorinated Solvents
- Heavy Metals
- Formaldehyde
- Allergic and carcinogenic disperse dyes (web link to AFIRM group reference)

Click Here to learn more about the restricted/ banned substance groups above.



More sustainable dyeing options

With continuous innovation and development by chemical manufacturers, there are many more sustainable dyeing options available in the market today. These products are designed to help wet processing mills become more resource efficient by reducing the need to use as much energy, water, as well as chemical products themselves to produce the same or better outcome compared to conventional dyes.

Restriction on hazardous chemicals

In addition, chemical manufacturers who offer more sustainable products typically meet rigorous international standards and certifications against restricted or banned substances and such as bluesign, GOTS and ZDHC MRSL.

Examples

Examples of dyeing products that reduces the use of natural resources include:

- Avitera by Huntsman (learn more here) (weblink)
- Cadira by Dystar (learn more here) (weblink)
- CHT BeSo (weblink)

Garment Dyeing

In garment dyeing, the final product is dyed. This has the advantage that in a very late stage just before retail, the product can be dyed in the latest fashion colours.

The process is carried out batch wise, using reactive, direct dyes and pigments.

Watch this video on garment dyeing: Video link

Source: C.P. Company Garment Dyeing

Environmental concerns:

- Garment dyeing is done in washing machines, and requires high amounts of water, chemicals and energy, done at high temperatures.
- Old top-loading washing machines (pictured below, right) uses more water and energy.

Sustainable Garment Dyeing Options

- Front loading machines are more efficient.
- Tonello for example has a new machine called UP, specifically designed to reduce water usage and bring liquor ratio down for garment washing.
- Learn more here
- Weblink here.

1. Introduction to Wet Processing

Printing

Textile printing is the process of applying colour to fabric with patterns or designs.

There are many ways to print on fabric, some are done by machine and some by hand.

Printing methods include:
- Screen printing (👁 definition)
- Sublimation printing (👁 definition)
- Discharge printing (👁 definition) (▶ Video)
- Flock printing (👁 definition)
- Foil printing (👁 definition)

Hazardous chemicals concerns during printing:
- Heavy Metals Extractable
- Phthalates
- APEOs
- Organotin Compounds
- Formaldehyde
- Chlorinated Solvents

(👁 Learn more here)

More sustainable printing
Using water-based printing systems (as opposed to solvent based) (👁 Learn more here)

Environmental Concerns:
While the amount of water used to wash printing screens or equipment might not be significant, the water must be treated. Most printing units will not require having their own wastewater treatment plant, but they should be able to prove how they handle the wastewater legally and properly.

Digital printing
Image source: Kornit Digital

1. Introduction to Wet Processing

Washing and Finishing

Washing and finishing techniques can change how the garment looks, feels or hangs

Finishes can also be used to impart value-added attributes such as softening, wrinkle resistant, anti-bacterial or flame-retardant finishes, or odor, water- and stain-repellent finishes.

Hazardous chemicals concerns during washing and finishing
- Alkyl phenols (AP) and Alkylphenol ethoxylates (APEO)
- Formaldehyde
- PFCs
- Brominated flame retardants
- Organotins
- Potassium Permanganate

(Learn more here)

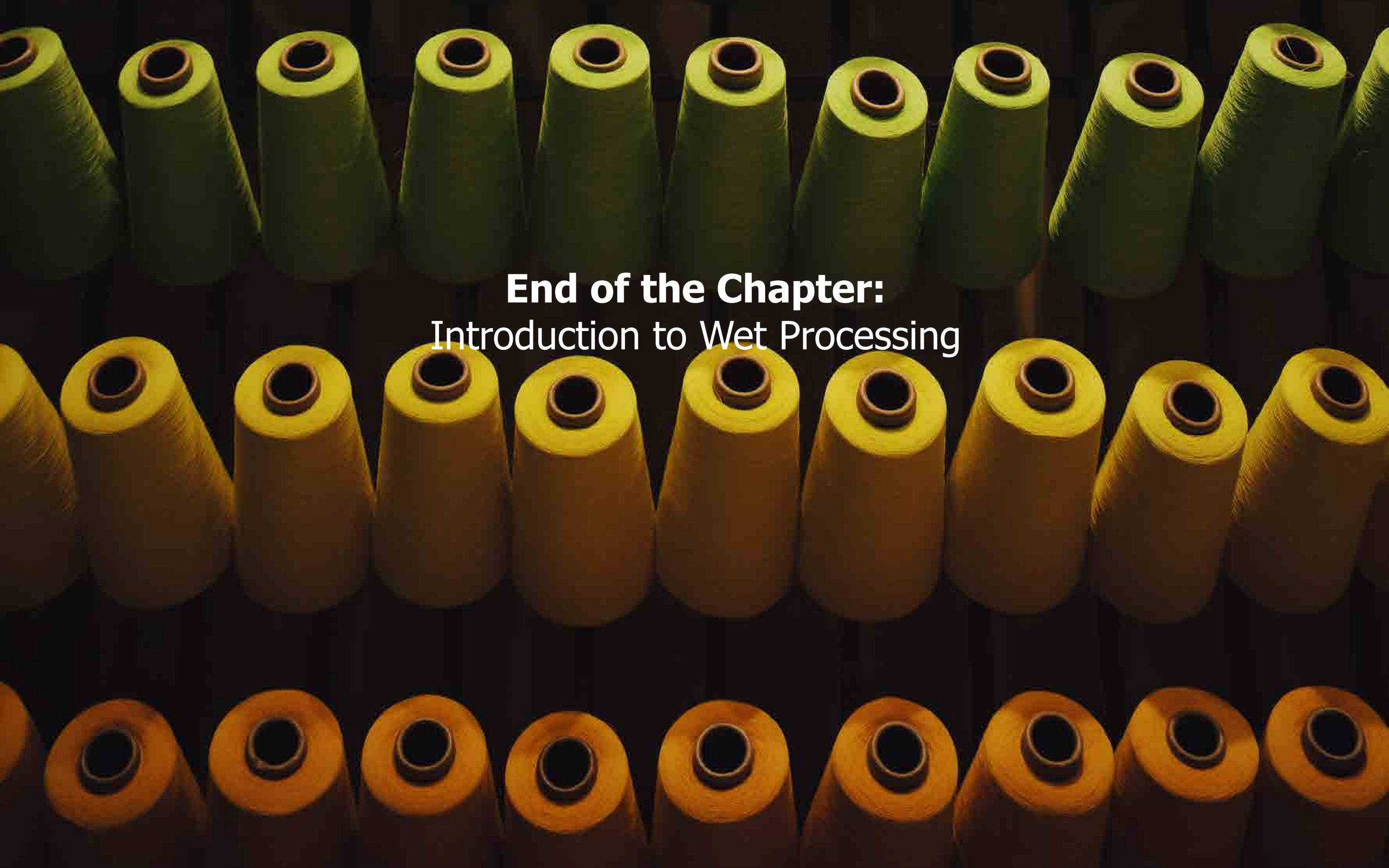
Health and Safety Concerns during finishing
Sandblasting in denim (Most brands banned since 2010). A sustainable alternative is to use laser treatments (see sustainable 'finishing' options).
Potassium Permanganate (PP) spray is used for denim bleaching. PP is Sustainable alternatives are available (e.g. OrganIQ by CHT)

Environmental concerns during washing
Vast amounts of water (and energy) is needed to complete washing processes. To address this, water efficient treatments can be used, and some machines can help achieve the same look and feels with less or no water at all. See 'More sustainable washing options'.

More sustainable washing options
- Jeanologia E-Flow – mostly used for denim (Learn more here)
- Jeanologia Ozone treatment
  - mostly used for denim (Learn more here)

More sustainable finishing options
- Finishing chemicals from Beyond surface technologies (weblink)
- Bionic finish from Rudolf Group (weblink)
- Laser treatments – mostly used for denim (Learn more here)

Sustainability performance measurement tool
- EIM tool (weblink)



End of the Chapter:
Introduction to Wet Processing

2. Environment

Introduction

There are impacts that affect the environment throughout all stages of textile and apparel production.

This section of the guidebook will walk through the different environmental topics including energy use, air emissions and greenhouse gases (GHG), water use, chemical use and wastewater.

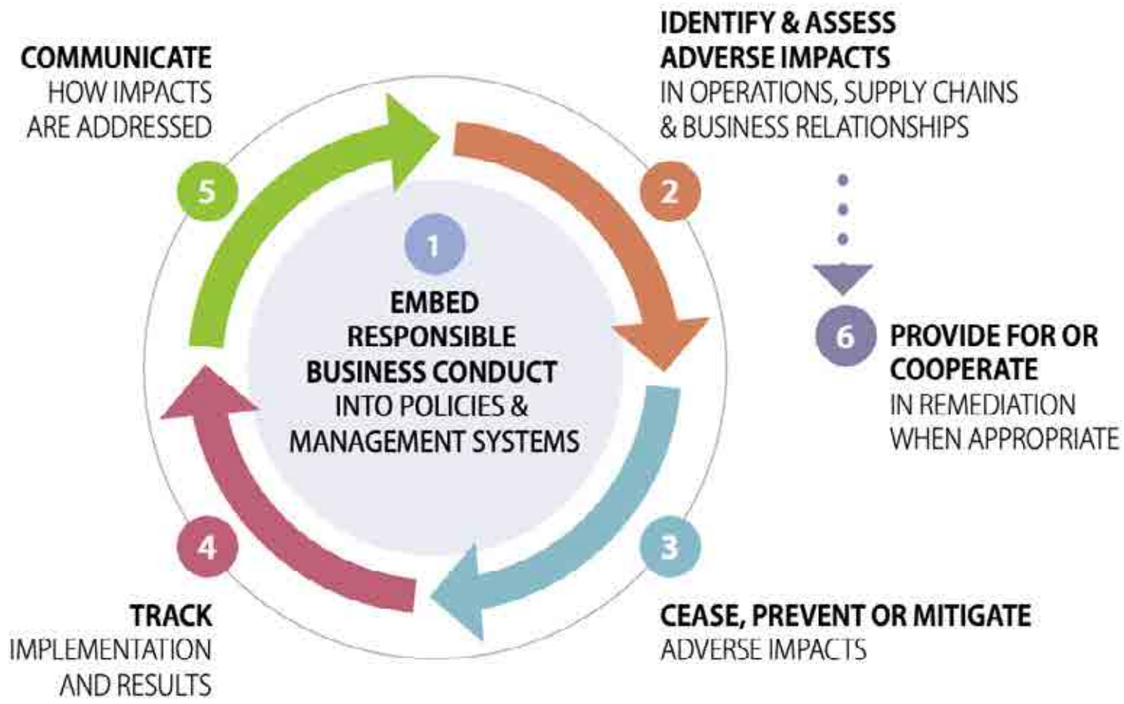
Under each topic, the key impacts areas within wet processes will be explored. Solutions and opportunities on how challenges can be addressed will also be presented.

OEDC Due Diligence Cycle

The [OECD Due Diligence Cycle] can be used as a way to work with the suggested solutions provided in this chapter.

The suggested solutions can first be made into policies, then as suggested in the cycle on the right, follow up processes can be made to ensure of continuous improvement against the different challenge areas.

Due diligence process & supporting measures



Due diligence process & supporting measures
Image source:
OECD Due diligence guidance for responsible business conduct, page 21

Energy Sub-menu

Introduction to energy use

Solutions to climate change

Introduction to energy use

The issue:
Although the textile and apparel industry is not considered an energy intensive industry, it is still a very large industry, making up 2 percent of the world's Gross Domestic Product (GDP).

Use of fossil fuels
To enable such a scale of an industry, a heavy amount of energy, mostly through the use of fossil fuels (learn more here) are used during every part of a garment product's lifecycle: from creating fibres; to running machinery to create, dye and finish fibres and fabric; to transporting goods to retail shops; and even running in-home washing and drying machines to take care of our garments – the total footprint is significant.

This footprint results in a vast amount of green house gas (GHG) being released into the atmosphere and ultimately contributing to climate change.

Contribution to climate change
Climate change, also called global warming, refers to the rise in average surface temperatures on Earth. 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.

Useful links:
- What are fossil fuels?
- What are the negative impacts of fossil fuels?
- How does the world consume energy?

What are the causes and effects of Climate Change?
Watch video: National Geographic, YouTube (3 mins)

Impact of making a pair of jeans

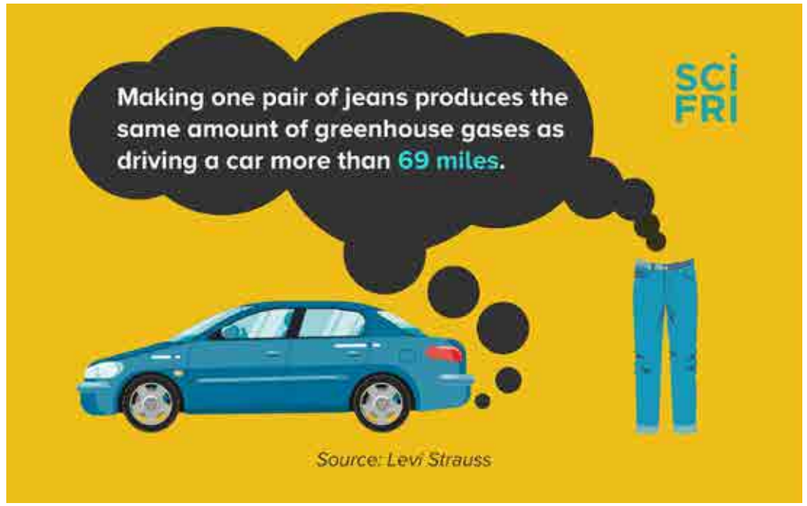


Image source: Levi Strauss, designed by Andrea Corona

Energy Sub-menu

Introduction to energy use

Solutions to climate change

Solutions to climate change

Here are some key ways to reduce energy use and lower GHG emissions during wet processing:

1) Incentivise factories to use more efficient and economical machines
Old machines might not be the most efficient in terms of overall resource use (energy, water and chemicals). Although there are bigger upfront costs, upgrades can be offset quickly through economical savings particularly in energy use and causing less long-term loss both environmentally and economically.

2) Use better chemicals
Chemical products with sustainability benefits can help reduce the need as much energy, water and chemical use. Learn more under 'use better chemicals' under the chemical chapter.

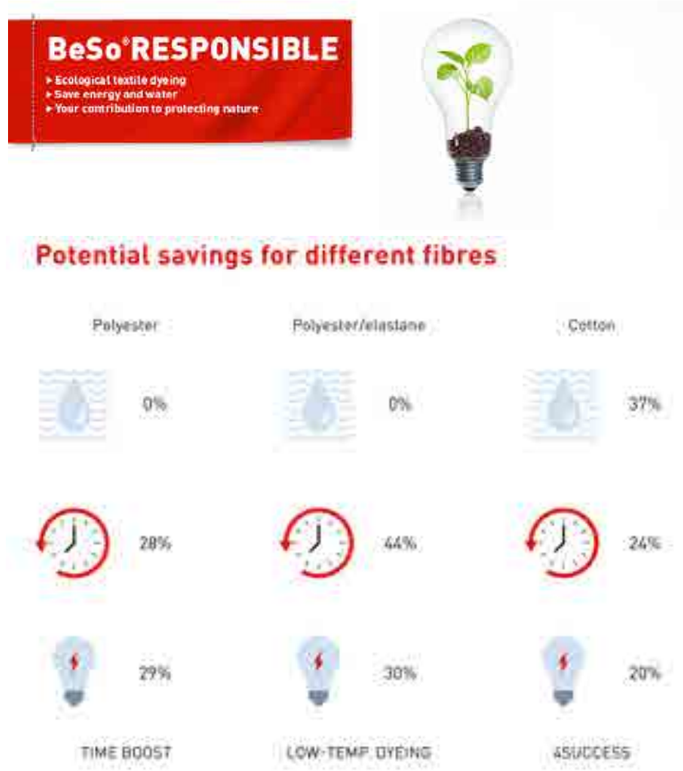
3) Avoid non-renewable energy and incentivise factories to use renewable energy instead
Encourage factories to employ renewable energy where possible such as using solar power.

4) Encourage factories to look into overall energy usage
Encourage factories to work with energy consultants to identify opportunities where savings can be made. These areas can include improvement opportunities in motor systems, fan systems, lighting systems and steam systems. There are solutions for all budget ranges. Vast amounts of money can be saved quickly with proper implementation of energy efficiency solutions. Read a related article here.

5) Specific insights:
For specific insights and sustainable solutions on specific wet processes, please refer to chapter 1 on 'Introduction to wet processing'.There is a section that presents sustainable solutions per process.

Example of better chemical product

BeSo Responsible by CHT



For more information, visit CHT.

Water Sub-menu

Introduction to water use

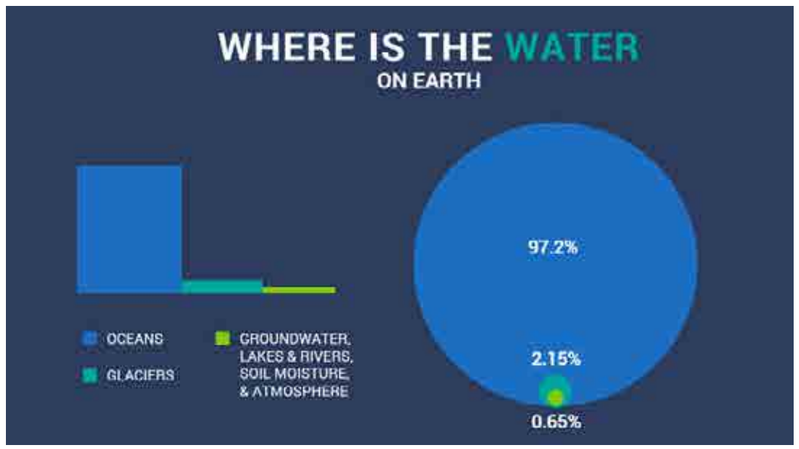
Solutions to water issues

Introduction to fresh water use

The issue:
Fresh Water is a scarce resource. While nearly 70 percent of the world is covered by water, only 2.5 percent of it is fresh. The rest is saline and ocean-based. Even then, just 1 percent of our freshwater is easily accessible, with much of it trapped in glaciers.

This precious 1 percent is needed to keep us alive; to drink, cook, bath, clean, irrigate crops and feed livestock, in addition to keeping all other livelihoods thriving on this planet.

The other challenge with fresh water, is that it is not evenly distributed to all citizens across our planet. With climate change, the situation is intensified where droughts are longer, and water scarcity is becoming more severe.



Click here to expand image

Image source: Earth How

Challenge of water use in the fashion industry

When it comes to the fashion industry, a lot of fresh water is needed to create and care for a piece of garment. During a garment product's life-cycle, water is used to create the fibres; dye the fabric; wash the garment; and washed at home by the end consumer.

The volume of water consumed by the fashion industry today is already large with nearly 79 billion cubic meters—enough to fill nearly 32 million Olympic-size swimming pools.

Global Fashion Agenda (GFA) and Boston Consulting Group anticipate that water use will increase by 50% by 2030, which is critical, because some of the main cotton-producing countries such as China and India are located in areas that are already suffering from high or medium to high levels of water stress. (GFA Pulse of the fashion industry, 2017).

Thus, as water scarcity becomes more extreme, cotton-growing nations and the fashion industry may face the dilemma of choosing between cotton production and securing clean drinking water.

As an industry that uses and pollutes water, it is important to look into ways to reduce, or even reverse negative environmental impacts.

Water Sub-menu

Introduction to water use

Solutions to water issues

Solutions to water issues

Here are some key ways to reduce water usage during wet processing:

1) Measure water
By Measuring and monitoring water consumption, factories can become more conscious about water use and set targets to lower water intake.

2) Use better chemicals
To combat water scarcity as well as water pollution, there are better chemical product options for dyeing and finishing materials Many chemical companies offer products with solutions such as water and energy saving.

3) Treat Wastewater
Industrial facilities must make sure all wastewater is treated properly, whether is it done on-site, or off-site. See 'Wastewater' for more information. When using internal wastewater treatment plants, facilities must routinely examine whether the treatment plant is functioning properly and test the wastewater to ensure all requirements are continuously met.

4) Use water efficient wet-processing methods
There are many ways the use of water can be reduced during wet processes; from using front loading washing machines, to opting for cold-pad-batch dyeing methods, to using waterless dyeing machines that utilizes supercritical CO2 instead of water to dye fabric (example – DyeCoo). For specific insights and sustainable solutions on specific wet processes, please refer to chapter 1 on 'Introduction to wet processing'. There is a section that presents sustainable solutions per process.

Wastewater Sub-menu

Introduction to wastewater

Solutions to wastewater issues

Introduction to wastewater discharge

The issue:
Clean freshwater is a precious resource and wastewater must be handled properly. Places with plentiful water could still be water scarce if the water is unsafe to use.

Wastewater from wet processes
When untreated or improperly treated wastewater enters waterways, a series of environmental problems can occur, causing pollution and mainly disrupting or killing aquatic life:

- Eutrophication is when the environment becomes enriched with nutrients. This can be a problem in marine habitats such as lakes as it can cause algal blooms.
- Persistent, bio accumulative and hormone-disrupting chemicals are found in some chemicals used by the textile industry. These types of chemicals are difficult to be completely treated and generally stay in the environment and builds up in the food chain, e.g. in fish.

Since wastewater produced during the manufacturing process is often discharged directly back into rivers and waterways, the quality of treated wastewater should comply with discharge regulations to avoid polluting the environment and causing irreparable damage.

However, this is often not the case. Unfortunately, these chemicals are often still present in wastewater, even in trace levels, when they are discharged into the environment, which has been proven to cause lasting damage.

WATCH:
RiverBlue is documentary (trailer here), on a journey that uncovers water pollution caused by the fashion industry. It examines the destruction of rivers, its effect on humanity, and the solutions that inspire hope for a sustainable future.

Eutrophication

Image source: The new ecologist

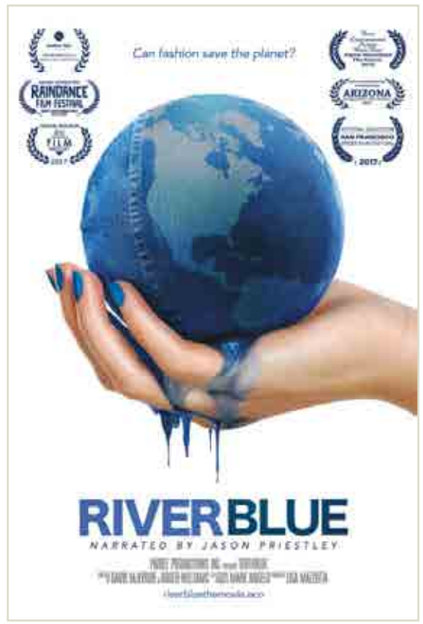


Image source: River Blue

Energy Sub-menu

Introduction to water use

Solutions to wastewater issues

Solutions to wastewater discharge issues

Here are some key ways to address wastewater issues usage during wet processing:

1) Treat Wastewater
The textile industry uses various substances, ranging from solvents to resins and from caustic soda to bleach. Many used substances are harmful if released directly back into open bodies of water without treatment.
Industrial facilities must make sure all wastewater is treated properly, whether is it done on-site, or off-site.
When using internal Wastewater treatment plants (WWTPs), facilities must routinely examine whether the WWTP is functioning properly and test the wastewater to ensure all requirements are continuously met.

2) Follow the ZDHC wastewater guideline
The purpose of the ZDHC Wastewater Guidelines is to set a unified expectation across the textile and footwear industries for wastewater discharge quality, which goes beyond regulatory conformance.
The guideline covers not only conventional wastewater parameters, but also for hazardous chemicals.

3) Use better chemistry
To combat wastewater issues, there are chemical products that do not contain or meet restricted requirements so that hazardous chemicals do not end up in the wastewater in the first place.
When factories select chemicals to be used, they should look for products that meet international standards or requirements such as GOTS, ZDHC MRSL, OEKO-TEX Eco-Passport and bluesign. As a brand/retailer, these requirements can be requested, and the factory should communicate them directly to their chemical suppliers.
Learn about setting up a purchasing policy here.

4) Specific insights
For specific insights and sustainable solutions on specific wet processes, please refer to chapter 1 on 'Introduction to wet processing'. There is a section that presents sustainable solutions per process.

2. Environment

Introduction to chemical use

The topic of chemistry plays a significant role when it comes to influencing overall environmental impact during wet processes.

While there are choices that can be made under the topics of water and energy, it is ultimately chemical choices that influences the biggest burden, i.e. wastewater pollution.

In addition to controlling wastewater pollution, some chemical products obtain technologies where less water and energy is required during the processing stages.

In terms of health and safety, using better chemical products also reduces the amount of toxic substances exposed to workers.

Input

Environmental choices:
- Use less water
- Avoid operating in water scarce areas
- Be conscious about water footprint

Impact level: Medium

Environmental choices:
- Adopt energy efficiency practices
- Opt-in for renewable energy where possible
- If less water is used, less energy is also used in parallel.

Impact level: Low

+

Environmental choices:
- Use better chemicals (Contains no hazardous chemicals or are restricted)
- Use sustainable chemistry that saves water and energy

Impact level: High

Output

Environmental concerns:
- Some hazardous chemicals continue to be released through washes at home by the end consumer

+

Environmental concerns:
- Pollution load based on chemical choices
- Depletion of fresh water
- Some hazardous / restricted chemicals cannot be treated through wastewater treatment

Environmental concerns:
- GHG emission are caused by most types of general activity. It is not usually pin-pointed as a wet processing specific issue.
- Depletion of non-renewable resources

End of the Chapter:
Environment

3. Chemical Management

How Chemical Management came into the spotlight

While companies have long worked on chemical management and implementing their own Restricted Substances List (RSL), the topic shot to prominence as a key environmental sustainability concern in 2011.

That year, Greenpeace, an environmental NGO, launched a campaign called 'Detox', which targeted International brands and retailers of the fashion and sportswear industry to eliminate the use and discharge of hazardous chemicals from their supply chain.

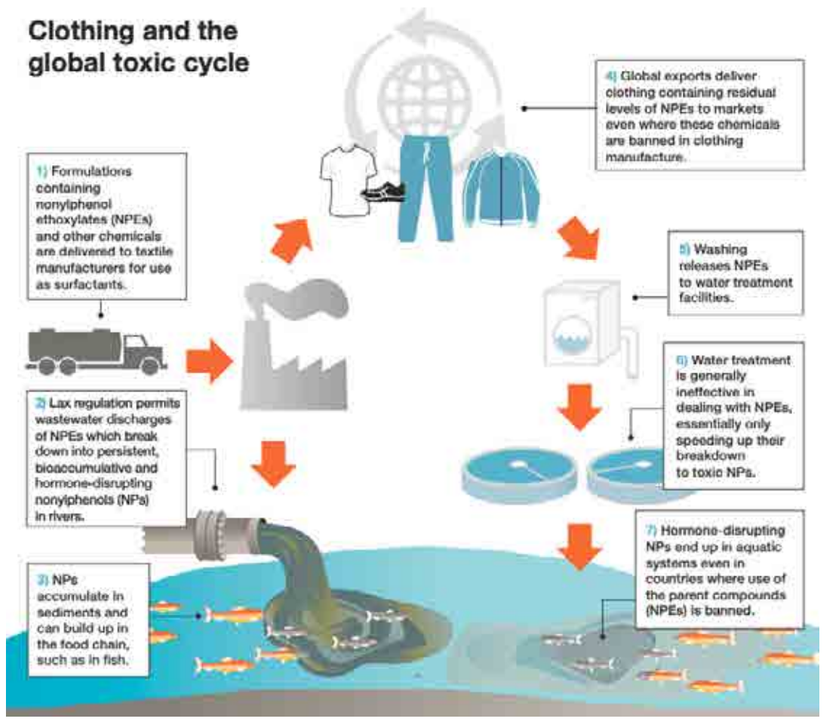
At the same time, the EU REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) EC 1907/2006 regulation began gaining momentum and recognition, placing the overall topic of chemistry in the spotlight.

In 2015, the ZDHC Manufacturing Restricted Substances (MRSL) was also launched – which became the industry's most adopted and recognised MRSL. The launch of this MRSL helped shift brand and retailer chemical strategy from being product focused (using an RSL) to material/ production focused (using MRSL). 👁 Learn the difference between RSL and MRSL here.

What are Hazardous chemicals?
Hazardous chemicals mean all those that show intrinsically hazardous properties: Persistent, bioaccumulative and toxic (PBT); Carcinogenic, mutagenic and toxic for reproduction (CMR); Endocrine disruptors (ED)/ Hormone disruptive, or other properties of equivalent concern.

While 👁 11 priority chemicals were identified for elimination, Greenpeace highlighted the urgency for elimination of APEOs (which includes NPEs and NPs) which are hormone disruptive (see graphic on the right) and PFCs because they are not known to break down in the environment and they move through soil to drinking water. This is why many scientists refer them as "forever chemicals".

Detox commitment
The campaign attracted a lot of international attention and various brands and retailers quickly commitment to 'Detox'
👁 see a summary of the commitment here.



Hormone disruptive chemicals: 👁 click here to expand
Image source: Greenpeace, Dirty laundry report 2

3. Chemical Management

How Chemical Management came into the spotlight

Industry Initiatives
Since brands started committing to the Greenpeace Detox campaign, industry groups started forming to gather resources and ideas on how to collectively eliminate hazardous chemicals.

ZDHC
First, the Zero Discharge of Hazardous Chemicals group was formed.

The six founding signatory brands (Adidas Group, C&A, H&M, Li-Ning, Nike Inc. and Puma SE) worked together to develop the ZDHC 'Roadmap to Zero', which outlined activities to reach the ambitious goals.

The ZDHC group expanded to new members which include more brands, retailers, suppliers/ manufacturers, chemical companies, industry partners and more.

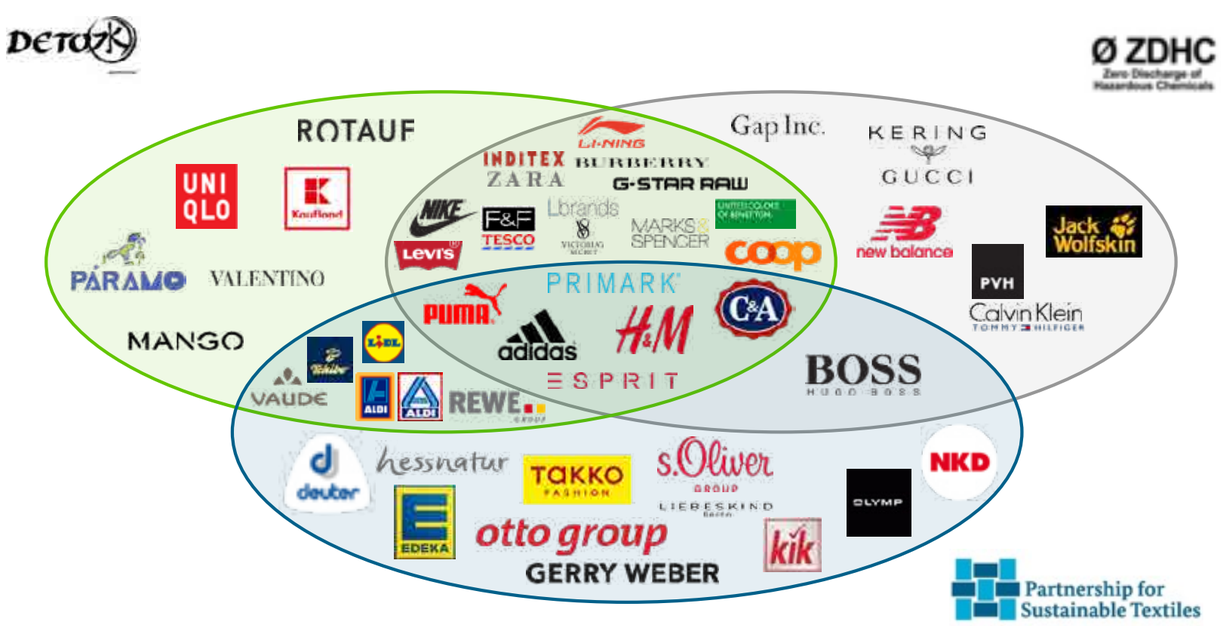
Since its inception, ZDHC has developed multiple tools and guidelines to advance towards the phase out of hazardous substances. These tools include:

1. ZDHC MRSL(link)
2. ZDHC Wastewater Guidelines (link)
3. ZDHC Gateway (link)

View a summary of all the ZDHC tools here.

Companies committed to eliminating hazardous chemicals:
Today, there are many brands, retailers, manufacturers, chemical suppliers and industry partners that are committed towards the elimination of hazardous chemicals.

While some of them have committed to the original detox commitment, some of them are only committed to the ZDHC roadmap, or the Partnership for Sustainable Textiles (who is collaborating with ZDHC and SAC), or they are simply working on chemical management without public commitments.



Link to Partnership for Sustainable Textiles here

3. Chemical Management

Introduction to Chemical Management System

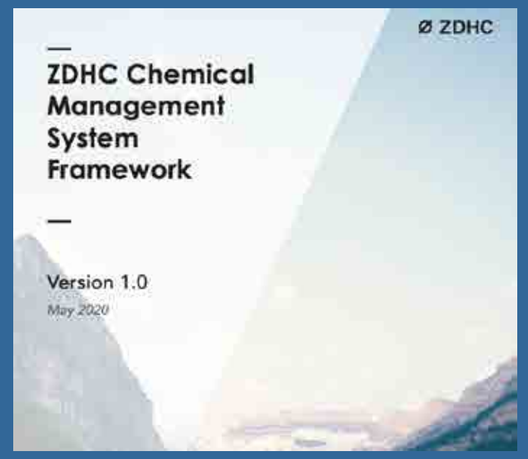
The system of managing chemicals in a factory to ensure consumer safety, worker health and safety and minimal environmental impact is called as Chemical Management System (CMS).

Key pillars of a Chemical Management System

- Defining clear chemical requirements through MRSL and RSL
- A compressive chemical Inventory (shows what chemicals are used on-site)
- A system to manage Material Safety Data Sheets (contains all information needed to use and handle a chemical product)
- A purchasing and approval process for sourcing new chemicals
- Proper Storage and Handling (see Health and Safety chapter)
- Proper wastewater and waste disposal (see Wastewater chapter here)

Tips:

- Check at the facility if all chemicals from all departments are covered in the scope of the CMS, for example: spot cleaning, washing, printing, maintenance, ETP
- Learn more on Chemical Management Systems Framework on the ZDHC website www.roadmaptozero.com



Ensuring of Continuous improvement

To manage the chemicals holistically, a management system flow can be adapted. A typical management system follows an adaptation of the 'plan, do, check, act' flow.

The OECD due diligence guideline also follows this similar flow.

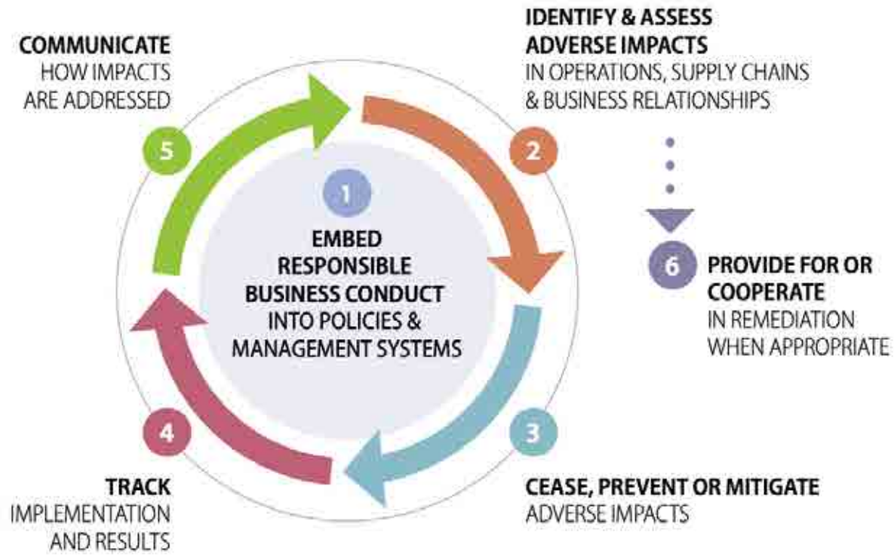


Image source: OECD Due diligence guidance for responsible business conduct, page 21

Outcomes of CMS

- Having your facility Implementing a Chemical Management System will help to achieve the below objectives:
- Improved compliance to environmental regulations
- Meet brand expectations for restricted chemicals usage
- Secure worker safety
- Increased profitability through optimal use of chemicals
- Better management and controls over dangers associated with chemical usage

Solutions to Chemical Issues

Here are some key ways to address chemical issues during wet processing:

1. Outline clear chemical requirements

RSL/ MRSL:
Today, most brands have their own Restricted Substance List (RSL) and some have their own, or have adopted an industry Manufacturing Restricted Substance List (MRSL) (What is the difference?). These documents outline the acceptable limits of restricted substances in chemical formulations identified in the finished product (RSL) and in the chemicals used during the manufacturing processes (MRSL).

- Industry RSLs include ones from: AAFA and AFIRM
- Industry MRSLs include the ZDHC MRSL.

The Dutch Trade Association MODINT can help purchasing companies develop custom made RSL/MRSL based on the products and markets of the company. MODINT can also support the work on implementation of RSL/MRSL in the supply chain and setting up a management system to control product and process.

International Industry Standards
Many chemical products today meet international standards and guidelines such as GOTS, Bluesign, Oeko-tex, ZDHC MRSL. These chemical standards cover rigorous MRSL requirements. When factories use chemical products that meet or are approved by those standards, they can be deemed more sustainable.

2. Use better chemistry

First, Substitute non-compliant chemistry
An important part of the CMS is based on substitution of hazardous chemicals. When hazardous chemicals (or restricted substances) are identified, it is crucial for the chemical compliance manager to discuss the matter with the chemical supplier and find an alternative for substitution.

Use Preferred chemistry
Many chemical products available in the market today meet rigorous MRSL requirements and standards. Key international standards and guidelines include GOTS, Bluesign, Oeko-tex, ZDHC MRSL. When factories use chemical products that meet or are approved by those standards, they can be deemed more sustainable.
Examples of chemical suppliers who offer wide ranges of preferred chemistry here.

Choose Sustainable chemistry
On top of preferred chemistry, some chemical suppliers offer products that have energy and water saving benefits, thus deeming them 'Sustainable chemistry'. Here are some examples of sustainable chemistry below:

- Huntsman Avitera
- Dystar Cadira
- Rudolf Bionic Finish
- CHT C2C certified products
- Archroma Advanced Denim Technology
- Garmon colorants
- SOKO Chemicals for Denim and Garment Dye
- Novozymes

End of the Chapter:
Chemical Management

4. Health and Safety

Introduction

Health and Safety is an imported topic to assure that safe working conditions for the workers are met and to prevent that harmful chemicals can leak into the environment.

Good management of chemicals starts before the chemicals arrive at the facility. Facility should correctly plan projects to minimize the amounts of chemicals used.

Storage and Handling

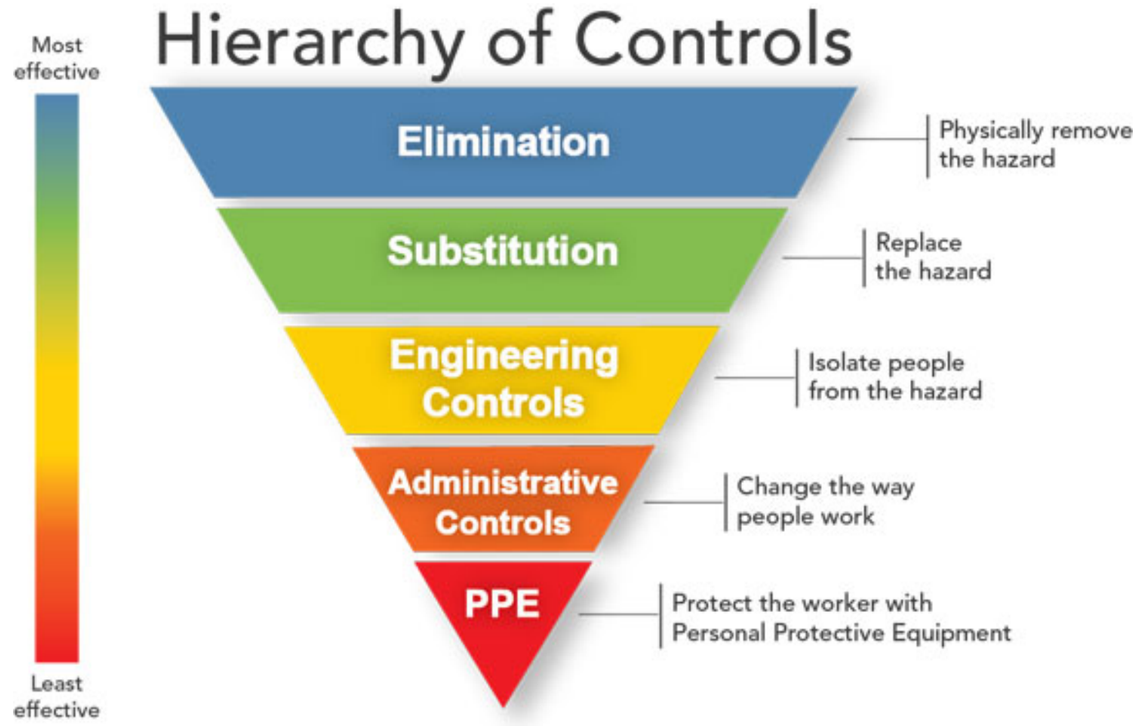
For the storage and handling of the chemicals it is important that the design & construction of the chemical warehouse should take into account possible scenarios if any leaking arises.

PPE

PPE which is the abbreviation of Personal Protective Equipment. On the right is a diagram of the different controls that can take place before resorting to using PPE. By following this hierarchy, safer systems can be substantially reduced. While PPE is hugely important, it is more sustainable to address the fundamental issues first. For example, if solvent-based glues were to be replaced by water-based glues, workers will no longer need to wear masks to protect them from harmful VOCs.
PPE must always be in accordance with PPE information mentioned in the Material Safety Data Sheet of the chemicals.

Responsibility

In the facility there should always be a person within the chemical management team that is responsible for ordering and providing the adequate PPE for every chemical. The facility must have a person that should follow up several times a day if the PPE is correctly used by the workers.



Hierarchy of controls
Image source: CDC

4. Health and Safety

Storage and Handling

In the wet processing facility different storage areas for chemicals can be identified.

- The first area is where the chemicals are stored after being delivered to the facility. Here, the chemical data verification will take place (see images here).
- The second is the area that is used for distributing the chemicals that will be used in the process (see images here).

First chemical storage area

Storage compatibility

Chemicals must be separated by compatible groups in a specialized storage areas without direct contact with the ground (see compatibility chart here).

In the storage area there must obvious signage that displays the risk of the chemicals and the PPE that is needed to be used (see signage examples here).

Storing hazardous chemicals

Hazardous chemicals in the first storage area must be stored of the floor in racks or on pallets.

In the second storage area, they should be in secondary containers (see images here) to prevent spillage.

It is important that chemicals are not exposed to direct sunlight.

Secondary storage area

Other safety notes

Always check that correct fire extinguishing equipment for handling of spills and leaks from containers are available (see examples here).

Tips:

- When visiting a wet processing facility it is always important to look at house cleanliness.
- Factories may use a traffic light system to indicate products of danger.
- When working with chemicals the workers should be well protected and it should be clearly indicated which protection workers need to wear

Click here for a check list of good practices.

4. Health and Safety

PPE

PPE or Personal Protective Equipment is indispensable to protect workers who are working with hazardous chemicals.

Different PPE
Different chemicals require different PPE. Information on appropriate PPE can be found in the Material Safety Data Sheet that goes with the chemical (👁 See good vs. bad practice pictures here).

- Hearing safety: When working with devices that make noise above the OHSA permissible noise exposure levels workers should protect their ears against damage. (👁 see examples here).
- Eye safety: When working with hazardous chemicals it is important to wear the correct protective glasses or goggles that will protect the workers against eye injury from splashing liquid chemicals.
- Face protection: When working with larger quantities of chemicals it can be needed to use full face protection such as face shield.
- Masks: Worker will need to wear face and nose mask to be protected against exposure to dust or airborne chemical particles and odours from solvent vapours.
- Skin protection: For protecting skin exposure to acids and other hazardous chemicals the worker must wear appropriate protective gloves.
- Clothing: Workers should wear if needed appropriate protective clothing to prevent skin exposure to chemicals. Examples are aprons, work suits and boots.

Improper handling of chemicals:
Various health and safety risks can arise when handling chemicals without PPE or appropriate PPE (👁 Learn more here).

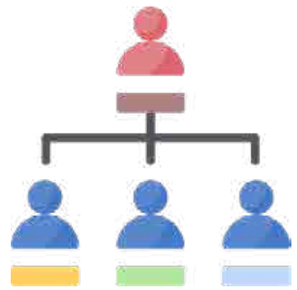
4. Health and Safety

Responsibility

One of the key elements of chemical management is the chemical management team. The responsibility for implementing a chemicals management program does not rest with an individual person but is a team effort where different departments work together. When visiting a wet processing facility this can be checked by doing interviews and checking the level of cooperation between the departments.

Organisation and teams

- Occupational Health & Safety (OHS) Manager to oversee the entire chemicals management system. Is in many cases also responsible for the PPE. Works together with the rest of the team to ensure compliance with the customers requirements. They provide on-site internal trainings to all the involved workers .
- Effluent Treatment Plant (ETP) Manager / Technician to provide insight and understanding of effluent impacts of chemical inputs
- Product Quality Manager to ensure that any chemical purchases/substitution meet not only product performance needs but also compliance of the requirements of the customer.
- Responsible for operations / production to ensure the correct application of chemicals (e.g. nature, quantity) for product production
- Purchasing Manager to ensure alignment of chemical purchases in accordance with any requirements such as, Legal requirements, GOTS, OEKO-TEX and ZDHC MRSL



Tips:

- Overall: Always do a quick visual check on how the chemicals are stored and how the workers are protected against contact with hazardous chemicals.
- Signage: Through the facility there should be clear visual signs that identify the risks and how to protect workers against these risks.
- Training: When discussing with the OHS manager, check if they have provided any internal training to all workers involved. What kind of trainings have they provided? Are the trainings documented?
- Proactivity: Allow the OHS manager explain how chemical management is organized, how is the team working together, and what do they do to eliminate restricted substances. Are they continuously looking for more sustainable chemicals?

End of the Chapter:
Health and Safety

5. Baseline Assessment

Introduction

This section is a guide on how to make a simple baseline assessment at a wet processing facility.

Please note that this is not an in-depth assessment, and technical knowledge is not necessary. The goal of this assessment is to guide a non-technical person on how to judge a facility's overall environmental and health and safety performance, as well as specifically their chemical compliance performance. Note this assessment does not cover social compliance.

An in-depth assessment should be performed by a technical auditor with wet-processing knowledge. They are better able to judge in detail and provide tailored corrective actions that are specific to individual facilities.

Where to start?
The questions outlined in the next pages can be adapted based on whether an on-site visit is possible. While it is preferred to do an on-site visit, a basic assessment still be made with the same questions, and where visual checks are needed, you may ask for photo evidence to be submitted instead.

Assessment flow:
First, capture a profile of the type of facility they are, then the following key areas can be assessed:

- Management system
- Awareness and knowledge
- Chemical Compliance
- Sustainability Capabilities

An overall benchmark per facility can be drawn by scoring each section (1-5 stars), and an analysis can be made to help identify areas where facilities might need further support on. See the scorecard section at the end.

5. Baseline Assessment

Factory Profile

!! IMPORTANT - Save your answers: You may save your answers by saving this file. Simply use 'file> save as'.
Tip: Why is a factory profile important? A factory profile helps the assessor remember the type of facility that was assessed.

General Information

Date:

Name of washing/dyeing facility:

Address:

Country:

Sustainability / Compliance Manager

Is someone in the factory managing sustainability and compliance? (Covering Water, Energy, Waste, Chemicals, Health and Safety)

Name:

Email:

Chemical / Wet processing Manager

Name:

Email:

Factory Information

What is produced or processed at this factory?

Apparel Knit-wear Woven Denim Home-textile

Process types

What types of processes are conducted at this factory?

Cut and Sew Embroidery Printing Dyeing Washing
Finishing Other (specify)

What materials are produced or processed?

Cotton Polyester Polyamide/Nylon Elastane
Viscose/Rayon Wool Other (specify):

Is the factory participating or fulfilling in any environmental initiatives or certifications?

SAC Higg FEM ZDHC programs AMFORI BEPI
bluesign GOTS GRS
OEKO-TEX: 100 STeP Made in Green Eco-Passport
ISO 14001 LEED
Others: please specify

Notes:

5. Baseline Assessment

MS Sub-menu

Introduction to MS

MS Questions Part 1

MS Questions Part 2

How to review MS Questions

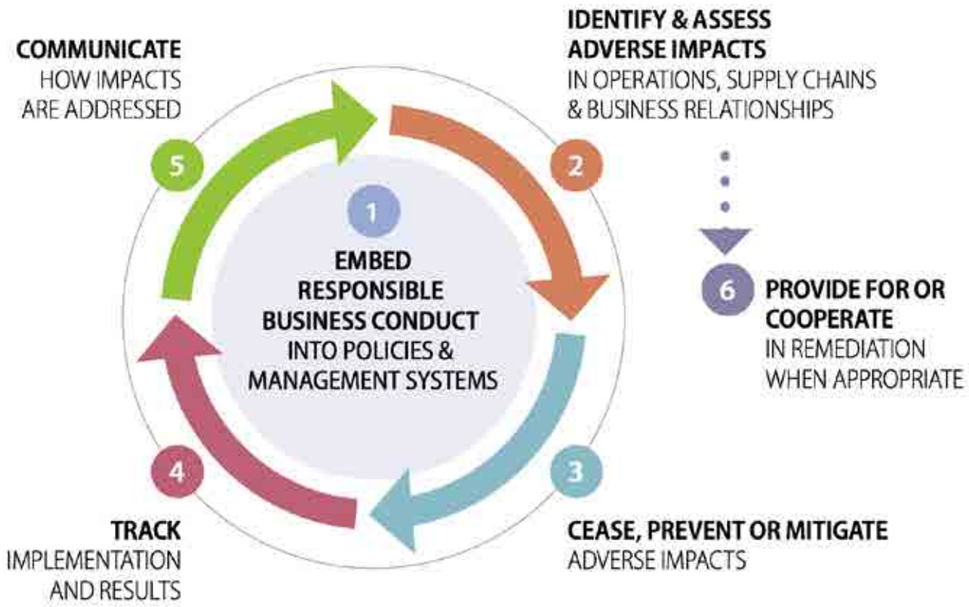
1. Management System

Why are management systems important?
A management system (MS) is a set of policies, processes and procedures that can be used by organisations to ensure objectives can be achieved, fulfilled and constantly improved. Without these written structures and processes in place, objectives can be lost.

A management system also works in a continuous loop to ensure of continuous improvement, and typically follows the flow of Plan, Do, Check and Act.

The OECD Due Diligence Guideline, which adds an additional dimension of making a risk assessment. It also follows the same logic of having policies in place, implementation, checking and acting to ensure continuous improvement.

Learn about how to make a management system assessment and how to judge their answers in the next pages.



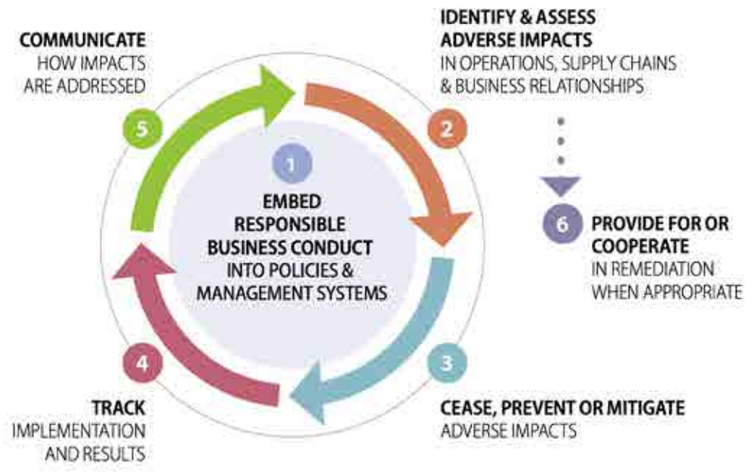
OECD Due Diligence Cycle
Image source: OECD

5. Baseline Assessment

MS Sub-menu

1. Management System

Questions to ask: Part 1



OECD Due Diligence Cycle
Image source: OECD

Policies and Management Systems (point 1, per diagram above)

- Are company policies written to manage areas of energy, water, chemicals and wastewater?
- Are these policies integrated in the company's Code of Conduct (CoC)/ Responsible Business Conduct (RBC)?

Review policies (points 2 and 3, per diagram above)

- Did you do a proper risk analysis focused on (waste) water, energy , chemicals?
- Are all risks considered?
- Are all opportunities for improvements identified?
- How can risks be mitigated?

Implementation: Team: (point 4, per diagram on the left)

- Does the factory have a responsible team for implementing the written policies?
- Does the factory have a responsible team to mitigate the risks?

Implementation: Routines and Procedures: (point 4, per diagram)

- Are there routines and follow up procedures to ensure compliance and continuous improvement?
- Are these routines and procedures documented?
- Are routines communicated to all relevant persons through documented channels and fully implemented?

5. Baseline Assessment

MS Sub-menu

Introduction to MS

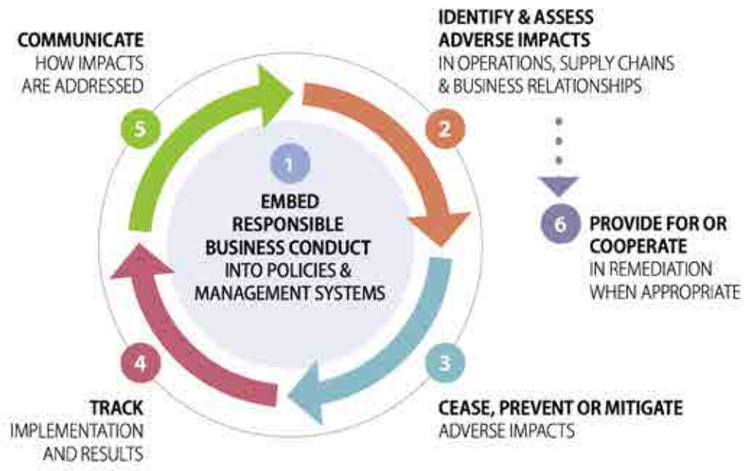
MS Questions Part 1

MS Questions Part 2

How to review MS Questions

1. Management System

Questions to ask: Part 2



OECD Due Diligence Cycle
Image source: OECD

Implementation: Impact (point 4, per diagram above)

- Are goals per year written? Are there any KPIs?
- Is progress documented?
- How do facilities ensure goals are met?

Communication, Feedback and Control (point 5, per diagram)

- Is there a complete documented feedback mechanism and clear signs that actions are taken according to feedback?
- Is feedback properly communicated back to all relevant persons?

Continuous Improvement (point 6, per diagram)

- Is there a plan of action or remediation process in place if goals are not met, or issues were found upon review?

Notes:

5. Baseline Assessment

MS Sub-menu

Introduction to MS

MS Questions Part 1

MS Questions Part 2

How to review MS Questions

1. Management System

How to review Management System answers?
In general, you are looking for whether they have a general understanding of how all environmental areas are managed in terms of water, energy, wastewater and chemicals.

While there are no 'textbook' answers for reviewing this section, here are some pointers on how to review their management systems across the above areas. What you are looking for are logical answers that meets your satisfaction. How the factory demonstrates (through showing you, or documentation) or replies (their attitude) to those questions can sometimes tell you a lot already on how they handle their environmental management systems.

POLICY:

- Do they measure or document water, energy and chemical use?
  - Can they show you records? They should be able to show you records from recent years.

- **Water source wise;**
  - Can they show you that they are extracting water legally?
  - If the factory is using a source other than from the municipality (tap water), then usually, a permit is needed to extract water from ground or river sources. Can they show you documentation? If not, can they explain why?
  - Do they have goals to reduce the amount of water used? How? Do they document the changes?
  - They might recycle water. Ask them how they use the recycled water.
- **Energy wise;**
  - do they have goals to reduce the amount of energy used? How?
  - Do they document the changes? Can they show you what has been implemented? E.g. lightbulbs, machine upgrades, etc.

- **Chemical wise**
  - Do they have policies to ensure chemicals purchased meet their own or customer requirements? (e.g. if chemical must meet GOTS – can they show you GOTS certifications?) (See chemical management chapter for specific recommendations)
  - Do they identify chemical risks? Do they have goals to phase out high risk/ hazardous chemicals? How do they know which chemicals are high risk vs. preferred? They should be able to explain or even teach you how they do this. (See chemical management chapter for specific recommendations)

RISK IDENTIFICATION

- Do they know what kind of risks might arise in their facility, in all areas?
- Have they ever done an opportunity assessment where they ask a technical person to come over to assess where savings can be made in water use and energy use?
- Chemical and wastewater wise, have they had a technical person review their chemical inventory? Do they know how much of the chemicals they use are 'preferred' chemistry? Have they done any correlation studies between what is tested positive in their wastewater vs. what is used on-site (what they list in their chemical inventory) (See chemical management chapter for specific recommendations).

IMPLEMENTATION, VERIFICATION AND REVIEW

- Do they review whether their goals for water, energy, wastewater and chemicals are met?
  - If so, how often do they review these areas?
  - Are records available when asked?
- Wastewater wise, do they check whether their wastewater is good enough? Do they check against the ZDHC wastewater guideline? How often? Do they test the wastewater through external parties like BV or SGS? Can they show you records?

5. Baseline Assessment

2. Awareness and Knowledge

Why awareness and knowledge should be assessed?
This section provides the assessor an indication of how aware the facility is already when it comes to industry initiatives and how much they are already taking part. By knowing some of the initiatives indicates a good start, and if they are already participating in some of the programmes, it means they should already have some sustainability capacity or capabilities in place.

Is the factory aware of local legislation requirements?
If so, what are they and can they show you how they meet them?
Tip: They might show you government issued certificates, to show they meet requirements per areas of water usage, energy usage/ emissions discharged, wastewater discharge.

Have they tested their wastewater?
- Have they tested against local legal guidelines?
- Do they know what local legal guidelines are?
- Have they tested against ZDHC Wastewater guidelines?

Is the factory aware of industry initiatives, such as Greenpeace Detox, ZDHC requirements?
Tips:
- Many facilities are aware of some sort of chemical requirements by now, through the requests of brands.
- By requirements, most brands require chemicals to meet internationally recognized standards/ approvals such as GOTS, ZDHC MRSL, bluesign, and many others (see chemical management chapter for more details).

Have they been involved with SAC Higg/ have submitted a Higg self assessment? **Tip:** If they have done a Higg assessment, they should be able to show you their submission, along with their score.

- If they have <u>not</u> done a Higg self assessment, have they done any other environmental assessments? If so, what was the outcome?
- For any type of assessments done, what are some of the examples of improvement areas identified? Did they work on it? Are there records?

Are they involved with any environmental programs with other brands?
There are many other initiatives set up by brands or organisations. If they are involved already and can demonstrate implementation or progress, then they are already steps further ahead than many wet processing facilities.

5. Baseline Assessment

3. Chemical Compliance

Why are chemical compliance questions asked?
Chemical compliance plays a large role in influencing overall environmental impact at wet processing facilities.

Visual Checks

- Does storage seem appropriate, clean and organized?
- Are chemical products labelled?
- Are hazards and dangers clearly identifiable?
- Is Personal Protective Equipment (PPE) available and used by workers?

Tip: Refer to the Health and Safety chapter for photos of good and bad practice:
Here for Storage and Handling Here for PPE

Documentation Checks/ Questions:

Purchasing practices:

- Does the factory have a purchasing policy and screening process, indicating which types of chemicals should or should not be purchased?
  - Does the factory have their own RSL or MRSL?
  - If they use an industry or brand RSL/MRSL, which ones do they use?
  - Are the requirements communicated and did the chemical supplier confirm that the requirements are met? (e.g. must meet ZDHC MRSL / are GOTS approved)
- Does the factory collect chemical related documents such as Material Safety Data Sheets (MSDS), Technical Data Sheets (TDS) and Chemical Supplier declarations such as ZDHC MRSL approve, bluesign approved, GOTS approved, OEKO-TEX Eco passport approved, Greenscreen, etc?
- Does the factory spot-check chemicals to ensure MRSLs are met?
- What is their protocol? Testing parties include BV, SGS and many others.

Chemical Inventory:

- Does the factory have a complete chemical inventory?
  Tips:
  - Dyeing facilities should have dyes, basic chemicals (e.g. salt) and auxiliaries (e.g. for fixation)
  - Printing facilities should have pigments and basic chemicals
  - Washing facilities should have washing chemicals (e.g. softeners) and auxiliaries
  - Other chemicals:
    - Chemicals used in the Wastewater Treatment Plant should be included (if they have an internal treatment plant)
    - Chemicals used for cleaning should also be included
- How often do they update their chemical inventory?
  Tips: Chemical inventories should be updated when new chemicals are purchased.

5. Baseline Assessment

4. Sustainability Capabilities

Why do we ask sustainability capability questions?
While chemical management plays a significant role in wet processing, areas of water, energy and wastewater should also be covered so that environmental impacts are tackled holistically. At a basic level, all resource use and discharge should be measured. At a more progressive level, the factories are expected to have longer term goals to reduce overall environmental impact.

Water:

- Does the factory measure water?
- What types of water sources are used, and is every source measured?
  - If they use water other than from the municipality, e.g. ground or river water; is the extraction legal?
  - If limits of certain sources are capped, are they met?
- Does the factory have annual goals to reduce water consumption?
  - How?
- Does the factory recycle water?
  - What is recycled water used for?
  - If yes, what is the recycling rate?

Energy:

- Does the factory measure energy consumption?
- What types of energy sources are used, and is every source of energy measured?
- Does the factory have annual goals to reduce energy consumption?
  - What are the goals?
- Does the factory have plans to invest in renewable energy?
  - What are the plans?

Wastewater:

- Does the factory measure wastewater output?
- Does the factory have their own wastewater treatment plant?
  - If yes, do they test the wastewater to ensure legal/ ZDHC requirements are met?
  - If no, do they treat wastewater off-site? (Tip: ask for proof of treatment such as bills of off-site treatment)

Sustainable Processes

- Have they invested in sustainable processes?, e.g. chemical wise or machinery wise?
  - Can they explain?
- Do they have any goals to improve their sustainability performance?
  - Can they explain?

Sustainable Products

- Does the factory produce any sustainable products for customers?
- Are any of the sustainable products certified? E.g. GOTS, OEKO-TEX 100, GRS, etc.
- Are the products more sustainable based on;
  - Using sustainable materials
  - Using sustainable chemistry
  - Using sustainable wet processes (machinery wise)

5. Baseline Assessment

Overall scorecard

This scorecard can be used to capture the overall impression of the facility based on observations made at the visit. These scores can then be compared and analysed, can be made on how to better support different groups of facilities towards sustainable wet processing improvements such as involving them in further training or more in-depth assessments.

Note: It might be difficult to do this scorecard right away especially if you are analysing facilities the first time. As a tip, it is good to write down some of your key observations from each visit across all areas first, then grade them once you have visited multiple facilities. That way, there is a better comparative view between the facilities.

Facility name:

Score date:

Instructions: Score each section from 1 (low) to 5 (high)

1. Management system: 0 1 2 3 4 5
Tips: How to score this section?

Comments:

2. Awareness and Knowledge 0 1 2 3 4 5
Tips: How to score this section?

Comments:

3. Chemical Compliance 0 1 2 3 4 5
Tips: How to score this section?

Comments:

4. Sustainability Capabilities 0 1 2 3 4 5
Tips: How to score this section?

Comments:

OVERALL SCORE 0 1 2 3 4 5

Comments:

End of the Chapter:
Baseline Assessment

6. Key Industry Initiatives, Tools, Certificates and Guidelines

Introduction

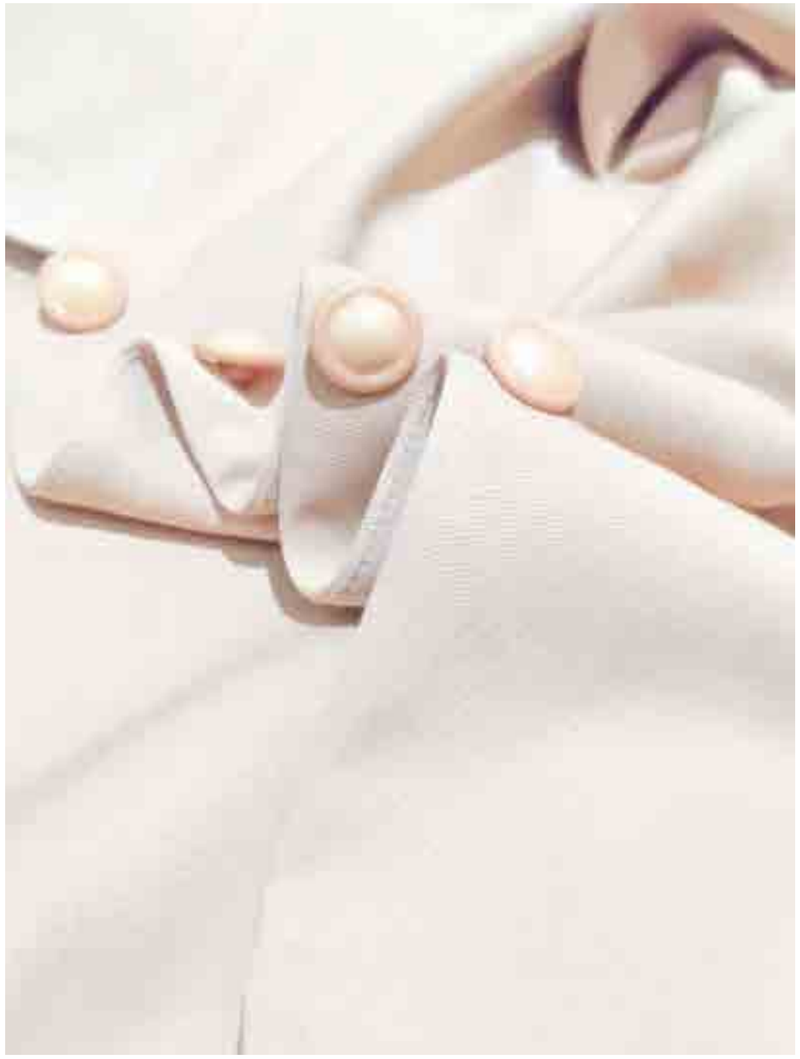
This chapter will provide an overview view and short explanations covering:

1. Key Environmental Industry Initiatives
Which key initiatives are there, covering different sustainability topics?

2. Environmental Facility Assessment/ Certification Tools and Guidelines What kind of tools can wet-processing facilities use to measure performance?

3. Environmental Product Certificates/ Certification Tools and Guidelines
What kind of product-wise certificates can wet-processing facilities achieve?

4. Chemical Compliance Tools
What kind of certificates are available to chemical products to indicate chemical compliance (by law or by industry preferred standards).



6. Key Industry Initiatives, Tools, Certificates and Guidelines

Introduction

From the UN's Fashion Industry Charter for Climate Action to Science Based Targets (SBTi), leading fashion businesses are making pledges and joining together for action in new ways and collaborating to tackle issues in newly identified areas. The number of potential initiatives that could be joined and certifications that could be attained can be overwhelming. Here are the key ones. Click on each one to learn more.

Climate

- UNFCCC Fashion Charter — Weblink
- Science Based Targets — Weblink
- EU Green Deal — Weblink

Chemicals

- ZDHC — Weblink
- Detox Campaign — Weblink

Circular

- Ellen MacArthur Foundation — Weblink
- Nederland Circular 2050 — Weblink

Manufacturing impacts

- Apparel Impact Institute and Clean by Design — Weblink
- PaCT, BMI, Solidaridad — Weblink for PaCT — Weblink for BMI

Industry Platforms and Frameworks

- Sustainable Apparel Coalition — Weblink
- Partnership for Sustainable Textiles — Weblink
- The Sustainable Trade Initiative (IDH) — Weblink
- Global Fashion Agenda — Weblink
- Fashion for Good — Weblink
- AMFORI BEPI — Weblink
- Dutch Agreement on Sustainable Garments and Textile — Weblink
  - OECD Due Diligence Guidance — Weblink

6. Key Industry Initiatives, Tools, Certificates and Guidelines

Facility Wise Assessment Tools, Certifications and Guidelines

Facility Assessment Tools

Facility assessment tools are the tools that facilities can use to measure and monitor performance.

- SAC HIGG FEM — Weblink
- amfori BEPI — Weblink

Facility Certifications

Facility certificates can be achieved by facilities to show compliance against industry standards / criteria.

- OEKO-TEX STeP — Weblink
- OEKO-TEX Detox to Zero — Weblink

Note: Detox to Zero is a verification program to Greenpeace's Detox requirements. Not a Certification.

- bluesign® System Partner — Weblink
- ISO: 14001 — Weblink

Coverage Key

- Water
- Energy
- Wastewater
- Chemicals
- Health and Safety

Payment Key

- Membership/ payment required
- Free to public

Other Facility Tools

- ZDHC Wastewater Guideline — Weblink
- MODINT Wet processing questionnaire supply chain — Weblink

6. Key Industry Initiatives, Tools, Certificates and Guidelines

Product-wise Environmental Tools, Certificates and Guidelines

Certification for Consumer Products

OEKO-TEX Standard 100
Weblink

Tip: Use this to show no prohibited chemicals were used to produced this product

OEKO-TEX Made in Green
Weblink

Tip: Use this to show no prohibited chemicals were used to produced this product + made in a 'Green' factory (STeP certified).

GOTS
Weblink

Tip: Certifies Organic Products only

bluesign PRODUCT
Bluesign Product
Weblink

Tip: Self declaration based. Labeller must be bluesign® SYSTEM PARTNER and must pass bluesign® ASSESSMENT for brands. Read full criteria here.

Product-wise Assessment Tools

EIM by Jeanologia
Weblink

Tips:
- Use this tool to measure impacts made in washing facilities only (mostly denim).
- Results can be used for consumer labelling.

MODINT ECO Tool
Weblink

Tips: Use this to make life cycle assessment of a product (LCA). The tool measures waste , energy and the carbon footprint of the full (estimated) lifecycle of a product.

Coverage Key

- Water
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- Wastewater
- Chemicals
- Health and Safety

Payment Key

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6. Key Industry Initiatives, Tools, Certificates and Guidelines

Chemical Compliance Tools

Certification for Chemical Products

- OEKO-TEX Eco-Passport — Weblink
- bluesign Approved — Weblink
- GOTS Positive List — Weblink

Industry RSL/ MRSL

- ZDHC MRSL — Weblink
- AFIRM RSL — Weblink

Search Engine

- ZDHC Gateway — Weblink
- bluesign bluefinder — Weblink
- Chemsec Marketplace — Weblink

Chemical Inventory Tools

- ZDHC In-check reports — Weblink
- The BHive — Weblink

Coverage Key

- Water
- Energy
- Wastewater
- Chemicals
- Health and Safety

Payment Key

- Membership/ payment required
- Free to public

End of the Chapter:

Key Industry Initatives, Tools, Certificates and Guidelines

7. Implementation Support Contacts

Solidaridad

Solidaridad Network
www.solidaridadnetwork.org
tamar.hoek@solidaridadnetwork.org

Solidaridad is an international civil society organization. We work with companies, manufacturers, mills, farmers and other players in the supply chain to make their production more sustainable.

Solidaridad designs and implements projects and programmes in the supply chain to improve the environmental and social performance of the cotton and textiles (i.e. wet processing and the Ready Made Garments) sectors. We can support you with different activities:

- Capacity building of the supply chain, in this specific case work with wet processing facilities towards reducing their environmental impact
- This always includes a baseline assessment and how-to follow-up on, with proper training, development and on-site support
- Developing and implementation of a (chemical) management system
- Looking at internal policies and procedures with regards to environmental issues in the supply chain, including training

Solutions providers / Consulting:

The following solution providers cover a range of services including:
- Capacity building of the supply chain
- Baseline assessment and how-to follow-up on
- Developing and implementation of a chemical management system
- Adoption of Safer chemistry
- RSL and MRSL implementation

GoBlu International Limited https://www.goblu.net

MODINT https://modint.nl

End of the Chapter:
Implementation Support and Contacts

8. Resources and References

Part 1 | Part 2

Resources and References:

Certifications:

Global Organic Textile Standard (GOTS)	https://www.global-standard.org
OEKO-TEX	https://www.oeko-tex.com

- OEKO-TEX STeP
- Made in Green
- Standard 100
- Detox
- Eco-Passport

ISO 14001 Environmental Management	https://www.iso.org
bluesign	https://www.bluesign.com

Chemical suppliers:

Architex Minerva	https://www.achitexminerva.com
Archroma	https://www.archroma.com
Bozzetto Group	https://www.bozzetto-group.com
CHT	https://www.cht.com
Colourtex	https://colourtex.co.in
Croda	https://www.croda.com
Cromogenia Units	https://www.cromogenia.com
DyStar	https://www.dystar.com
Eksoy	https://www.eksoy.com
Everlight Chemicals	https://en.ecic.com
Hubei Color Root	http://www.丽源科技.com
Garmon Chemicals	https://www.garmonchemicals.com
Huntsman	https://www.huntsman.com
Jay Chemicals	http://www.jaychemical.com
Jihua Group	http://www.jihuadyes.com

Chemical suppliers (continued):

Lonsen	http://www.longsheng.com
Protex	http://www.protex-international.com
Pulcra Chemicals	https://www.pulcra-chemicals.com
Soko Chemicals	https://www.sokochimica.com
Tanatex	https://tanatexchemicals.com
Thor	https://www.thor.com
Transfar	https://www.transfarchem.com
Trumpler	https://www.trumpler.com
Novozymes	https://www.novozymes.com

Circular:

Dutch Circular Textile Valley	https://www.dutchcirculartextile.org
Ellen Macarthur Foundation	https://www.ellenmacarthurfoundation.org
EU Green Deal	https://ec.europa.eu
NL Sector plan Circular 2050	https://hollandcircularhotspot.nl

Environmental:

United Nations UNFCCC	https://unfccc.int
Science Based Targets (SBTI)	https://sciencebasedtargets.org

Innovative washing and dyeing technology:

DyeCoo	http://www.dyecoo.com
Tonello	https://www.tonello.com
Jeanologia	https://www.jeanologia.com

8. Resources and References

Part 1 | Part 2

Industry Platforms:

The Dutch Agreement on sustainablegarments and textiles	https://www.imvoconvenanten.nl
Partnership for Sustainable Textiles	https://www.textilbuendnis.com
Sustainable Apparel Coalition	https://apparelcoalition.org
Fashion for Good	https://fashionforgood.com
Global Fashion Agenda	https://www.globalfashionagenda
Amfori BEPI	https://www.amfori.org
MODINT	https://modint.nl

Manufacturing Impacts:

Apparel Impact Institute	https://apparelimpact.org
Clean by Design	https://www.nrdc.org
IDH the Sustainable Trade Initiative	https://www.idhsustainabletrade.com
ITC Partnership for Cleaner Textile (PaCT)	https://www.textilepact.net
Better Mills Initiative (BMI)	https://www.solidaridadnetwork.org
ZDHC	https://www.roadmaptozero.com

Tools:

Environmental Facility Assessment:

Sustainable Apparel Coalition (SAC) Higg FEM	https://apparelcoalition.org/the-higg-index/

Washing Unit facility Assessment / Score:

EIM by Jeanologia	https://eim.jeanologia.com

Industry RSL providers:

AAFA	https://www.aafaglobal.org
AFIRM	https://www.afirm-group.com

Industry MRSL providers:

ZDHC	https://mrsl.roadmaptozero.com/

Wastewater Guideline:

ZDHC Wastewater guidelines	https://www.roadmaptozero.com

Chemical Inventory & Data Management:

ZDHC Gateway	https://www.roadmaptozero.com
The BHive	https://www.thebhive.net/

Search for Safer Chemistry:

bluesign bluefinder	https://finder.bluesign.com/
Chemsec Marketplace	https://marketplace.chemsec.org/

Attribution

Ownership:
This work is owned by the Solidaridad Network.
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The guidebook is jointly written by GoBlu International Limited and Fashion Production Solutions.

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The design of this guidebook was done by GoBlu international Limited.

End of Guidebook