Chemical Management Plans & Integration into Factory Process and Management

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Preface
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Why is Chemical Management essential?

- Contractual Relationship
- Consequences of non-compliance
- Discontinuation/stop of business
- Regulatory demand to comply with chemical regulations
  - Different Regulations, Directives, Legislations, Country Specific Laws in Global Market
Why is Chemical Management essential?

- Prevent any harm from using chemicals
  - Ensure workers health
  - Ensure not to pollute land, water and air
  - Produce safe products for the consumers
Specify Roles & Responsibilities

- Identify all staff involved in chemicals
  - RSL & Chemical Compliance Manager
  - Purchaser of chemicals
  - Chemical Inventory List Keeper
  - Chemical room / stock keeper
  - Developer of new chemical formula / recipes
  - All staff allowed to handle chemicals
  - Cleaning staff

- Assign missing roles and process
Education / Training / Communication

• Train all staff involved in chemicals
  o Purchaser of Materials / Chemicals
  o Production Manager
  o Workers
  o Chemical Room Manager / Stock Keeper
  o Cleaning Staff

• Ask your chemical suppliers and clients to support you in chemical training!
Realize Restricted Substances List (RSL)

• Read the RSL and Toolkit
  o Chemical Names
  o Hazardous Background
  o Restricted Limits
  o Required Test Method

• Ask your client, in case of any questions
Realize ZDHC Manufacturing RSL

- MRSL applies to chemical formulations
- Whereas RSL applies to materials, semi finished and finished products
- MRSL Threshold Limit Values on restricted substances apply to substances in commercially available chemical formulations
- Chemical formulations are highly concentrated before being diluted upon application to textiles and materials.
C&A is committed to ZDHC

- 2011 Greenpeace dirty laundry report
- DETOX Campaign Sport & Fashion Brands
- Industry Response
- Zero Discharge of Hazardous Chemicals
- Today 24 brands & Retailers committed to ZDHC together with over 50 value chain affiliates and 15 associates
Identify Safer Chemicals

CLEANCHAIN

- Chemical management tracking system

Ø ZDHC Gateway™

- Search engine for formulations conforming to the ZDHC MRSL

Ø ZDHC InCheck™

- Level of conformance against ZDHC MRSL
Chemical & Wastewater Management

- Sustainable Chemicals Management (SCM) Audit
- Stepping stone to Higg Index 3.0
- Facility Environmental Module 3.0
- Assessment of facility environmental and chemical management performance accepted by all members of the Sustainable Apparel Coalition
- Implementation commenced in 2017/2018, SAC members are working on adoption in their supply chains
  - Planned C&A implementation 2019
Validate elimination of hazardous chemicals

Ø ZDHC

- Wastewater Guidelines

Ø ZDHC ClearStream™

- Wastewater performance report

Ø ZDHC Gateway™

- C&A remains committed to public disclosure of wastewater test results

IPE

公眾環境研究中心
Hazardous Chemicals

- No production without chemicals
- Chemical auxiliaries:
  - Dyestuffs, colourants, printing inks, binders, fixing agents
  - Detergents, softeners, special finishings
  - Adhesives, solvents, anti-oxidation agents, anti-electrostatica,
- All chemicals are hazardous to some degree
- Proper Risk Assessment is key!
Chemical Risk Assessment

- SDS information
  - GHS hazard classification
  - Hazard / Precautionary (H/P) statements

- Contact chemical supplier

- All chemicals comply with RSL/MRSL?

- Chemical Inventory List
Chemical Inventory List

• Create comprehensive Chemical Inventory List
  o Use an electronic inventory list for tracking chemicals
  o Identify all chemicals in the factory
  o Record Chemical Name, Hazard Class, MSDS, etc.

• Perform regular inventory audits to identify chemicals that are not being used.

• Identify chemicals of concern – risk potential
  o Conduct risk assessment for each chemical
# Chemical Inventory List Template

1. **CHEMICAL INVENTORY**

<table>
<thead>
<tr>
<th>Chemical Name and CAS Identification Number</th>
<th>Hazard Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* Physical, Health and Environmental Hazards, Hazard statements (H phrases), Precautionary statements (P phrases)</td>
</tr>
</tbody>
</table>

- Work Instructions / Operation Instructions
- Personal Protective Equipment (PPE)
- Material Safety Data Sheets (MSDS)
- Container Size and location
- Dates on which chemicals are prepared or expired (disposal)

<table>
<thead>
<tr>
<th>Chemical formulation (English)</th>
<th>Chemical formulator (English)</th>
<th>Chemical formulator type</th>
<th>ZDHC use category</th>
<th>Amount onsite (unit)</th>
<th>Monthly usage (unit)</th>
<th>Do you have an MSDS/SDS?</th>
<th>Compliant with latest version of ZDHC MRSL?</th>
<th>Support document for ZDHC MRSL finding</th>
<th>Certifications</th>
<th>Expiry dates of certifications</th>
<th>Hazard classes from MSDS/SDS</th>
<th>Chemical test results against MRSL requirements</th>
<th>Details on compliance with Brand RSLs or Brand specific requirements</th>
</tr>
</thead>
</table>
Chemical Inventory - Ingredients

- List of chemical ingredients per formulation

<table>
<thead>
<tr>
<th>Chemical formulation (English)</th>
<th>Chemical formulation (Local)</th>
<th>Chemical formulator (English)</th>
<th>Chemical formulator (Local)</th>
<th>Chemical ingredient name from MSDS/SDS</th>
<th>Chemical ingredient CAS# from MSDS/SDS</th>
<th>Chemical ingredient % from MSDS/SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEVACRON 331-R</td>
<td>NEVACRON 331-R</td>
<td>DyStar Colours Distribution GmbH</td>
<td>DyStar Colours Distribution GmbH</td>
<td>Sodium hydroxide</td>
<td>1310-73-2</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>10-15%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Polyoxyl 20 oleyl ether</td>
<td>9004-98-2</td>
<td>5-10%</td>
</tr>
</tbody>
</table>

- List of chemical supplier contacts

<table>
<thead>
<tr>
<th>Chemical formulator (English)</th>
<th>Chemical formulator (Local)</th>
<th>Country</th>
<th>Website</th>
<th>Contact person</th>
<th>Telephone</th>
<th>Email</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>DyStar Colours Distribution GmbH</td>
<td>DyStar Colours Distribution GmbH</td>
<td>Germany</td>
<td><a href="http://www.dystar.com">www.dystar.com</a></td>
<td>Joe Bloggs</td>
<td>+49 6142 40720</td>
<td><a href="mailto:jbloggs@dystar.com">jbloggs@dystar.com</a></td>
<td></td>
</tr>
</tbody>
</table>
Purchasing Chemicals

- You can decide, if hazardous or only safe chemicals pass the factory gate!
  - Send clients’ RSL to your chemical suppliers
  - Ask chemical companies to provide detailed chemical information
  - Ask for and check Safety Data Sheet (SDS)
  - Demand for assurance letter of compliance
  - Ask clients to support you to identify hazardous chemicals and safe alternatives
  - If the chemical supplier doesn’t know what he is selling, don’t buy their chemicals!
Purchasing Chemicals

- Consider disposal cost at time of purchase
- Ask for handling and disposal requirements
- Reduce expired stock
- Use older stock first (first in first out policy)
- Do not accept donated chemicals without contesting
Chemical Purchasing Price

- Lower chemical purchase price is not always equivalent to cheaper production
- Calculate the price per garment considering dosage, water and energy consumption

<table>
<thead>
<tr>
<th>Chemical</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>50 USD / kg</td>
<td>150 USD / kg</td>
</tr>
<tr>
<td>Dosage per garment</td>
<td>25 grams</td>
<td>8 grams</td>
</tr>
<tr>
<td>Price per garment</td>
<td>1.25 USD</td>
<td>1.20 USD</td>
</tr>
</tbody>
</table>
Chemical Purchasing Price

• Buy concentrates and dilute during production, in case of long delivery distances, the transport costs play a significant role

• Chemical Companies are creating more and more Multifunctional Products, which has huge advantages, because of several properties in one product, you can save the usage of many different compounds

• Latest generation of dyes used in an intelligent design
Purchasing Raw Materials

• Buy only what you know
  o Type of material
  o Production background
  o Use AFIRM Risk Matrix to assess the risk to find hazard chemicals

• Source of raw materials
  o Reputable supplier

• Assurance/guarantee from supplier
  o Test reports (recent date, valid test method, same material)
  o Declaration / confirmation letter, eco labels
Root Cause Analysis & Corrective Action

- Establish process for dealing with potential non-compliance
  - Follow up action for non-compliance
    - Stop production
  - Identify the source for the non-compliant chemicals
    - Chemical Testing
      * Chemical Formulations
      * Raw materials
      * Components
      * Semi finished and final products
Root Cause Analysis & Corrective Action

• Root Causes
  o Contaminated tech. chemical products
  o Chemical containers not labeled or wrong labeled
  o Chemical containers not covered (no lid)
  o Production line and workspace not cleaned
  o Pair of scales out of calibration

• Corrective Action
  o Substitute chemical auxiliary
  o Exchange material
  o Destroy non-compliant materials
Verification of Compliance

- Verification Process
  - Documenting corrective and preventive action and verifying effectiveness of action taken
Thank you for your attention!