COUNTERING HUMAN TRAFFICKING THROUGHOUT THE SUPPLY CHAIN

Patchareeboon Sakulpitakphon
Private Sector Engagement Specialist
Winrock International / SSG Advisors
Countering Trafficking of Persons Throughout the Supply Chain

AAFA Product Safety and Compliance Conference 2017
19 October, Ho Chi Minh

Ms. Patchareeboon Sakulpitakphon (Mam)
USAID Asia Counter Trafficking in Persons (USAID Asia CTIP)
SSG Advisors for Winrock International
Outline

1. Definitions of forced labor and trafficking in persons (TIP)
2. Brief overview of international frameworks and policies
3. Relevance for businesses
4. Key focus area for action
5. Tools for companies
6. Q & A
Forced labor can be understood as work that is performed involuntarily and under the menace of any penalty.
Indicators of forced labor:

- Abuse of vulnerability
- Deception (especially in recruitment)
- Restriction of movement and isolation
- Physical and sexual violence
- Intimidation and threats
- Retention of identity documents
- Withholding of wages
- Debt bondage
- Abusive working and living conditions
- Excessive overtime
Why should businesses take action to prevent forced labor and TIP?

- Legal compliance
- Managing company risk and reputation
- Supply chain management (Codes of conduct or CSR)
- Trade and investment risk
- Strengthen stakeholder engagement
An AP investigation helps free slaves in the 21st century

Over the course of 18 months, Associated Press journalists located men held in cages, tracked ships and stalked refrigerated trucks to expose the abusive practices of the fishing industry in Southeast Asia. The reporters’ dogged effort led to the release of more than 2,000 slaves and traced the seafood they caught to supermarkets and pet food providers across the U.S. For this investigation, AP has won the 2016 Pulitzer Prize for Public Service. The articles are presented here in...
Supply Chain Risk: Five Worst Offending Countries For Human Rights Violations

Dina Medland, CONTRIBUTOR

Opinions expressed by Forbes Contributors are their own.

Awareness of supply chain risk has been steadily growing among publicly listed companies all over the world. Today's news is not reassuring: the risk of organizations breaching international human rights regulations has risen significantly over the last quarter as key Asian economies adapt to tougher economic conditions, according to a report just out.

Rising labor costs in China have led companies to diversify their supply-chains into other high-risk countries such as Vietnam, especially for electronics, apparel, and
All Your Clothes Are Made With Exploited Labor

Patagonia tried to stop human trafficking in its supply chain, but, as recently as 2011, internal audits found continuing abuses. Is the problem too massive for companies to solve?
March 11, 2015

“Work Faster or Get Out”

Labor Rights Abuses in Cambodia’s Garment Industry

Labor Rights Violations in Vietnam’s Export Manufacturing Sector

Worker Rights Consortium
May 2013
Case study: Ralph Lauren’s recruitment approach

- Requires all recruitment fees paid by workers to be reimbursed by the employer
- In one audit, Ralph Lauren identified that 33 of its Bangladeshi workers working for a supplier in Jordan was charged with recruitment fee
- Ralph Lauren worked with supplier to reimbursed the workers
- Continues to raise awareness and work for ‘recruitment fee-free’ supply chain
Recommended actions:

• Ensure compliance to the key labor rights (e.g. recruitment, direct hire)
• Conduct training for managers and employees
• Assess the risk for forced labor and TIP (purchasing, operations and supply chain)
• Engage with workers (e.g. worker’s voice, grievance mechanism)
• Engage with stakeholders e.g. trade unions, NGOs and policy makers
• Provide remedy if situations are identified
Useful tools and resources:

- **ILO’s SCORE Initiative for SMEs** – improving productivity, sustainability and job quality

- **The Higg Index 2.0** by the Sustainable Apparel Coalition
  [http://apparelcoalition.org/the-higg-index/](http://apparelcoalition.org/the-higg-index/)

- **Ethical Trading Initiative (ETI)**’s resources and trainings
  [https://www.ethicaltrade.org/](https://www.ethicaltrade.org/)

- **Know The Chain’s Benchmarks** and resources
  [https://knowthechain.org/](https://knowthechain.org/)

- **UN Guiding Principles on Business and Human Rights** and its reporting framework
  [https://www.ungpreporting.org/](https://www.ungpreporting.org/)
USAID Asia Counter Trafficking in Persons (CTIP) project

Five year (2016-2021) regional initiative that aims to reduce trafficking of persons through coordinated and consolidated action by governments, civil society and business.

The program focuses on the following objectives:

1. strengthened learning around trafficking-in-persons;
2. enhanced cooperation between various sectors in source, transit and destination countries; and
3. increased opportunities for private sector leadership in this area.
Questions?
Thank You

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Private Sector Engagement Specialist

USAID Asia Counter Trafficking in Persons
SSG Advisors

Mam.Sakulpitakphon@winrock.org

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Pathumwan, Bangkok, Thailand
KEEPING WORKERS SAFE IN THE FACTORY

Gabriel Amouyal
Audit Services Manager
AsiaInspection

Brad van Voorhees
Senior Manager, Global Responsible Sourcing
VF Asia Ltd.
(AI INTRO FOR AAFA TALK ON STRUCTURAL SAFETY)
Securing global supply chains with real-time business intelligence for brands, retailers and importers worldwide.

Supplier Audit Programs • Laboratory Testing • Product Inspections
In 2017, we will perform more than 250,000 audits, lab tests and inspections for brands, retailers and importers globally.
Factories audited were:

- **6.7%** Require immediate attention
- **61.2%** Need improvement in the medium term
- **32.1%** Good Condition

Structural audits carried out in the following areas:

More than 1000 audits, in 42 countries
Which countries / regions are the most affected?

- South and Southeast Asia particularly vulnerable.

- Figures represent the percentage of factories are in immediate risk/need improvement.
Continuous safety and compliance through regular follow-up: a yearly audit helps make sure that requirements are observed and necessary improvements are being made.
Our Structural Audits cover:

- **General Information**
  Detailed building descriptions, verification of structural certifications and construction approvals

- **Load Conditions**
  Assessment of load management floor by floor, identification of 'at risk' loads and misuse of the building

- **Structural System**
  Description of structural forms, building foundation system and alteration review

- **Structural Defects, Damages, Distress, Deformation or Deterioration**
  Assessment of the foundations, super structure, floor and roof

- **Plan and Alignment**
  Verification in key areas of the factory that the dimensions are compliant with the design plan

- **Exposure to Aggressive Environment and Maintenance**
  Evaluation of building maintenance, drainage and exposure to chemicals that could affect structural safety

- **Structural Surveys and Checks**
  Additional assessment of potential risky structures, such as water tanks, lifts and safety barriers
Take Control of Your Supply Chain with AI!
VF Global Responsible Sourcing

AAFA – PRODUCT SAFETY AND COMPLIANCE CONFERENCE

Ho Chi Minh City, Vietnam  October 19th, 2017

Brad van Voorhees
Senior Manager
Global Responsible Sourcing
Global leader in branded lifestyle apparel and footwear

Diverse portfolio of more than 30 powerful brands

Business model built on powerful platforms that provide a unique competitive advantage and fuel for growth
Across our brands we produce more than 1.5M units every day.
# A Few Facts

<table>
<thead>
<tr>
<th>$12.5B</th>
<th>59K</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016 global revenues</td>
<td>associates around the world</td>
<td>countries worldwide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>~1,400</th>
<th>NO. 1</th>
<th>~500 M</th>
</tr>
</thead>
<tbody>
<tr>
<td>owned retail stores</td>
<td>manufacturer of denim</td>
<td>Zippers used annually</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>~600M</th>
<th>$1.2B</th>
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<tbody>
<tr>
<td>yards of fabric purchased every year – enough to wrap around the earth 13 times</td>
<td>returned to shareholders in 2016</td>
</tr>
</tbody>
</table>
“I must do something always solves more problems than something must be done.”

Anonymous
RESPONSIBLE SOURCING
Better facilities where people thrive
Worker Rights and Safety

Product Stewardship and Traceability

Environmental Sustainability

Worker Development and Communities
Insufficient column at warehouse, drilled hole in column, rusted beam and column, unpainted welding with rusts.
CASE STUDIES - CRITICAL LIFE SAFETY

BEFORE

AFTER

BEFORE

AFTER
THANK YOU!

Brad van Voorhees
Senior Manager, Global Responsible Sourcing
Bradford_vanvoorhees@vfc.com
AFTERNOON COFFEE SPONSORED BY:

Asia Inspection.com®
Your Eyes in the Supply Chain
ENSURING FACTORY COMPLIANCE: REGULATIONS, CHEMICALS, & SUSTAINABILITY

Khoi Tran
Director, Country Manager
Hohenstein Institute/OEKO-TEX®

D. Balasubramanian
Regional Chief Executive
Bureau Veritas Consumer Products Services

Moderator: Nate Herman, Senior Vice President, Supply Chain, AAFA
Factory compliance
The OEKO-TEX® solution
AAFA Conference Ho Chi Minh City – October 2017
Textile Confidence | Product Safety | Sustainable Production | Transparency
OEKO-TEX® - A global textile solution
### Changes in market claim

<table>
<thead>
<tr>
<th>Traceability and transparency</th>
<th>Strategic risk management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsible sourcing</td>
<td>Sustainability in process and sourcing</td>
</tr>
<tr>
<td>Efficient cost and production structures</td>
<td>Product and consumer safety</td>
</tr>
</tbody>
</table>
Manufacturing Restricted Substances List (MRSL)
What is the STANDARD 100 by OEKO-TEX®?

- **Independent testing and certification** for textiles tested for harmful substances

- **Comparable product safety through worldwide legal conformity**

- **Flexible & up to date**: The RSL is adapted to new requirements and production methods on a regular basis
What does the certification include?

- Realistic risk assessment of potentially harmful substances in textiles by:
  - Inclusion of legal requirements
  - Scientifically sound criteria and test methods
  - Use-oriented testing

- Using a uniform set of criteria (RSL) for the analysis of harmful substances

- Quality assurance via spot audits

- Sample picks of goods placed on the market
What is the benefit for manufacturers & retailers?

- Reliable product label → optimized risk management
- Simplified and efficient B2B communication of product safety
- Strong selling point due to high international reputation
Search for OEKO-TEX® certified products

- Simplified, optimized data structure
- New PDF form for companies for an entry in the Buying Guide
- Additional information about those certificate owners, which can enter data via an on-line interface
- Webinar on the Buying Guide:
STeP by OEKO-TEX®
6 STeP by OEKO-TEX® Modules

6 sustainable aspects of STeP by OEKO-TEX®

- Chemical management
- Environmental management
- Environmental performance
- Social responsibility
- Health & Safety
- Quality management
1 Chemicals

Core principles
- Chemical management
- Comprehensive MRSL list
- Towards „green chemistry“
  ✓ Prevention
  ✓ Education & training
  ✓ Information and monitoring
Environmental performance

Core principles

• Energy-efficient
• Process KPI measurement
• Limits for air & water consumption, waste production
• Decreasing & optimizing costs
• Carbon Footprint
Environmental management

Core principles:
- ISO 14001 & others
- Legal regulations
- Continuous improvement
- Preventive measures
- Targets and responsibilities
4 Social responsibility

- ILO core conventions
- UN Charta for human rights
- Legal regulations
- Education & training
- Active contribution
- Internal communication and distribution of responsibilities
Quality management

• Based on ISO 9001
• Responsibilities, documentation, traceability
• Risk Management
• Continuous improvement process
6 Occupational health & safety

- Workers´ and workplace safety
- Occupational health
- Process safety
- Prevention
Certification process

1. Application
   - Customer fills in the application form and confirms the terms of use

2. Assessment
   - Customer's proceeding with the online assessment

3. Analysis of assessment data
   - OEKO-TEX® institute reviews the data provided by the customer

4. Preparation and conducting of audit
   - On-Site verification of the data by OEKO-TEX® institute

5. Data evaluation report writing & certification
   - OEKO-TEX® institute makes its final evaluation and delivers the STeP report and the certificate (if applicable)
Assessment overview
339/348 questions answered
637/888 points reached

Basic questions are mandatory to answer. Please tick "Whole Question Not Applicable" if not relevant for your facility.

Chemical Management and Assessment (CM)
14/14 questions
41/66 points
All basic questions answered

Environmental Performance
115/115 questions
149/250 points
All basic questions answered

Environmental Management
27/27 questions
59/64 points
All basic questions answered

Social Responsibility
74/79 questions
204/200 points
All basic questions answered

Quality Management
56/57 questions
73/88 points
All basic questions answered

Health and Safety Performance
53/56 questions
111/151 points
Unanswered basic questions

Assessment finished on Thu, 4 Apr 2013 11:59:10 +0200
Key data about STeP process

• Timeline: 8 - 12 weeks (depending on business structure)
• Requirement: Accuracy of data, since self assessment structure is the heart of the system
• Challenges: incomplete assessment = inaccurate facility data
• Opportunities: Full and transparent reporting of operating processes
What is the benefit for manufacturers?

A comprehensive analysis and evaluation of sustainable production, tailored for the textile and clothing industry:

• Provides image-enhancing and promotes the establishment of new business relationships through 3rd party verification

• Opens up economic value and performance through better process understanding and continuous improvement

• Includes cost-effective "pre-screening", which allows you to analyze your production performance (internal assessment)
Focus on “zero discharge of hazardous chemicals“  | ✔️ | ✔️ | ✔️  
Prevention and preparedness measures | ✔️ | ✔️ | ✔️  
Supporting the “Right to Know” approach | ✔️ | ✔️ | ✔️  
Providing a MRSL | ✔️ | ✔️ | ✔️  
Providing an audit protocol | ✔️ | ✔️ | ✔️  
Focus on management systems | ✔️ | ✔️ | ✔️  
Integration of Best Practice within the chemical management | ✔️ | ✔️ | ✔️  
3rd party on-site verification | ✔️ | ✔️ | ✔️  
Certification & standardization | ✔️ | ✔️ | ✔️  

The Comparison

<table>
<thead>
<tr>
<th>Demand</th>
<th>Demand</th>
<th>Solution</th>
</tr>
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<tbody>
<tr>
<td>Detox</td>
<td>Ø ZDHC</td>
<td></td>
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</table>

The Comparison table highlights the alignment between demands and solutions, focusing on various aspects of chemical management.
MySTeP by OEKO-TEX®
What is MySTeP by OEKO-TEX®?

MySTeP is a database to display the suppliers’ relationships. It provides a platform to easily administer and compare your suppliers.
Visualization of your supply chain
What`s the benefit for brands & manufacturers?

- **Risk assessment** of your supply chain
- **Comparability** and **benchmarking** of suppliers / producers and their performance
- Real-time management of **OEKO-TEX® certificates**
  - Standard 100 and STeP by OEKO-TEX®
- Optimize your sustainable procurement via **transparent supply chain management**
DETOX TO ZERO by OEKO-TEX®
Detox to Zero – Our Vision

**Tool:**
Analysis, evaluation and verification of Detox conformity in each production site.

**Target:**
Elimination of toxic chemicals

**Focus:**
Chemical Management, especially of the 11 priority groups

Status Quo Reporting & Corrective Actions
Our DETOX TO ZERO by OEKO-TEX® goals

- Reliable reporting system to verify your status to fulfil the Detox 2020 roadmap
- Independent tool to fulfil your transparency obligations
- Supported by OEKO-TEX®
  Buying guide to find alternative tested and verified textile chemicals
Product description in detail

Waste water & sludge
- Verification of water management process
- Evaluation of 3rd party waste water and sludge testing
- Publically available list of audit results on OEKO-TEX® website (facility’s permission needed)
- Reporting limits to track waste water performance

Waste
- Monitoring of handling and storage facilities
- Verification of disposal
- Check of documentation
Your Status Quo Analysis

Towards Detox Conformity

• Independent data evaluation through on-site audits
• Identification of toxic and hazardous Chemicals by MRSL verification
• Evaluation of Chemical Management System
• Comprehensive and transparent Status Report including Corrective Actions
• Serves the “right to know” principle through independent verification (publication of results on OEKO-TEX® website possible)
MADE IN GREEN by OEKO-TEX®
What is MADE IN GREEN by OEKO-TEX®?

The MADE IN GREEN product label can be awarded to any kind of textile, anywhere in the world, at any stage of the textile supply chain. Labelled products can be easily traced, offering the consumer as well as business partners new levels of transparency.
Products awarded with the MADE IN GREEN label are:

- made with materials tested sustainably produced for harmful substances and

* Sustainably produced in accordance with OEKO-TEX® guidelines.

The OEKO-TEX® guidelines refer to certain criteria defined in MADE IN GREEN by OEKO-TEX® standard. These can be found in the download area of www.madeingreen.com.

What is MADE IN GREEN?

= (STANDARD 100 by OEKO-TEX®)*

& (STeP by OEKO-TEX®)*
Facts about MADE IN GREEN by OEKO-TEX®

The label can be awarded to any kind of fabric anywhere in the world at any stage of textile production.

A new level of transparency: it shows individual value chains for certified products.

Worldwide legal compliance assured by a trusted and independent partner.
Clear communication

MADE with products tested for harmful substances

MADE in environmental friendly facilities

MADE in safe and socially responsible workplaces
Comprehensive certification

STANDARD 100 by OEKO-TEX® for the end product

STeP by OEKO-TEX® for all making up facilities

STeP by OEKO-TEX® for 85 % of total weight & components ≥ 5 % out of wet/chemical production facilities
www.madeingreen.com
What is the benefit for manufacturers?

The consumer label for products tested for harmful substances from sustainable textile production:

• Take advantage of MADE IN GREEN to ensure compliance with your commitments to NGOs

• Show your supply chain to your customers and clarify you assume responsibility

• Increase your credibility through independent product and process control
ECO PASSPORT by OEKO-TEX®
Meeting these requirements needs...

- **Knowledge** of all chemical ingredients in materials and products
- **Assurance** that ingredients do not contain impurities and side-products
- **Verification** of the MRSL and RSL requirements defined by industry groups, NGOs or brands
ECO PASSPORT by OEKO-TEX® is a comprehensive certification system for textile chemicals, colorants and auxiliaries to ensure their usage in sustainable production of human-ecologically optimized textile products.
RSL / MRSL Compliance Screening

STAGE I:
Transparent process to screen for chemicals of concern with a cost-effective compliance comparison.

Customers will be informed quickly and efficiently about:
• any non-compliance
• ingredients of concern in order to make substitutions prior to the analytical verification.
Theory vs. Practice

**Composition = Theory**
- 18% „substance C“
- 34% „substance B“
- 48% „substance A“

**Laboratory Results = Reality**
- 1% „contamination“
- 17.6% „substance C“
- 33.6% „substance B“
- 47.8% „substance A“
Examination

1% „contamination“
17,6% „substance C“
33,6% „substance B“
47,8% „substance A“
STAGE II
Analytical verification
in our laboratories to ensure certified chemical products do not contain unwanted impurities and side-products.
ECO PASSPORT test criteria

Substances which may be harmful to health:
- polycyclic aromatic hydrocarbons (PAH)
- certain alkylphenols and alkylphenolethoxylates
- allergy-inducing dispersion dyes
- pesticides
- chlorinated benzenes and toluenes
- volatile components
- chlorinated phenols

Legally banned and controlled substances for e.g.:
- certain azo colorants
- carcinogenic dyes
- pentachlorophenol
- formaldehyde
- phthalates
- PFOS and PFOA
- heavy metals
- banned flame retardants
- tin-organic compounds

Biologically active and flame-retardant substances:
- only ACP accepted for STANDARD 100 by OEKO-TEX® can apply
Certificate

Product Names
Certificate Number
Validity for 1 year

STAGE I RSL / MRSL SCREENING
STAGE II ANALYTICAL VERIFICATION
CERTIFICATE
Certification Benefits

For STANDARD 100 by OEKO-TEX® Certificate holder:
- Cost reduction for STANDARD 100 by OEKO-TEX® Certification
- Reduced error rate for STANDARD 100 by OEKO-TEX® Verification
- Meeting the right to know principle and encourages a chemical substitution strategy

For ECO PASSPORT by OEKO-TEX® Certificate holder:
- Independent third party verification in a non-disclosure system
- Suitability of legally safe textile chemicals for sustainable textile production
- Provides label to be used for marketing
Product integration into the OEKO-TEX® System

- Chemical product certification for harmful substances
- ECO PASSPORT certified chemicals meet the requirements of STANDARD 100 and STEP by OEKO-TEX®
- Factory certification for sustainable textile production
- Textile product certification for harmful substances
- Textile product sustainably produced and tested for harmful substances
OEKO-TEX® as solution!
Customer support worldwide

Over 860 employees worldwide – about 560 employees in the German headquarter

America
- Brazil
- Colombia
- Dom. Republic
- Ecuador
- El Salvador
- Guatemala
- Honduras
- Mexico
- Peru
- USA

EMEA
- Belarus
- Bulgaria
- Ethiopia
- Hungary
- Lithuania
- Mauritius
- Morocco
- Romania
- Russia
- Tanzania
- Turkey
- UK

Asia
- Bangladesh (2x)
- Cambodia
- China (2x)
- Hong Kong
- India (4x)
- Indonesia
- Laos
- Myanmar
- Pakistan
- Sri Lanka
- Syria
- Thailand
- Uzbekistan
- Vietnam
Your local contact

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Phuong 11, Quan Tan Binh
Ho Chi Minh City

vietnam@hohenstein.com
Phone: +84 28 62965229

www.hohenstein.com
ENSURING FACTORY COMPLIANCE:

REGULATION, CHEMICAL & SUSTAINABILITY

Comprehensive & pro-active approach

AAFA –HCM – 2017

D Bala, BV CPS
Bureau Veritas - Over 188 Years in business with 3 Absolutes:

**Safety,**  
**Integrity & Ethics**  
**Financial control**

### BV Group by Numbers

- 400,000 clients  
- 66,000 employees  
- 1,400 labs and offices  
- 900 accreditations and delegations  
- Strong brand built over 188 years  
- 140 countries of operation  
- 8 businesses. Consumer, Certification, Industry, Construction, In service inspection & verification, Marine & offshore, Commodities and Government services & international trade

### CPS Division by Numbers

- Millions of test reports issued each year  
- Hundreds of thousands of inspection and audits each year  
- Tens of thousands of clients  
- In excess of 12,000 employees  
- Expertise in working in 150 countries worldwide  
- 120+ labs and offices globally  
- Footprint covers 40 countries  
- Working with 22 out of the top 25 US retailers, 21 out of the top 25 global retailers, 22 out of the top 25 global brands.
Contents

➢ Why Chemical Management
  • Changing Priorities
  • Key Drivers
  • Commitments

➢ Chemical Management – Industry Challenges
  • Typical Industry Challenges
  • Current Market Situation

➢ Chemical Management – Bureau Veritas Solution
  • Our Chemical Discharge Management Approach
  • Service Offering
  • Product Mix

➢ Introducing BVE³
  • BVE³ Overview
  • Technical Endorsement
  • How BVE³ Works
  • Case Study
WHY CHEMICAL MANAGEMENT?
Chemical management – changing priorities

Pre 2000

- Management Systems (ISO 9000 / 14000)
- Product Testing

2000 - 2010

- Chemical Approval Programs
- Country specific regulations
- Voluntary Chemical Restrictions (Phase-out)
- Brand RSLs, Volunteer Standards
- Increasing Regulations such as CPSIA, REACH, GB etc
- Hazard Assessment (H&S, Toxicological analysis etc)

Post 2010

- Product Testing (RSL)
- Product certification and labeling
- Process Controls
- Beyond Product Testing
- Recipe screening & Process Controls
- SVHC disclosure
- Detox Campaign
- Brand RSLs / MRSLs, Increasing Regulations
- Environment Sustainability Initiatives
- Discharge (Effluent) monitoring
- Water re-cycling and re-use
- Sustainable Chemicals / Preferred Chemical Lists

Chemical Discharge Monitoring (Priority Chemicals)

Environment

- Water
- Soil
- Air

Health

- Beyond Garment
- SVHC
- Phase-out

Safety

- Holistic approach
- From RSL to MRSL
Chemical management – key drivers

- AAFA – AMERICAN APPAREL & FOOTWEAR ASSOCIATION
- AFIRM - Apparel and Footwear International RSL Management
- The Detox Campaign…
- Zero Discharge Of Hazardous Chemicals (ZDHC group)
- SAC - Higg Index (FEM 3.0 – Nov 2017)
- Institute of Public & Environmental Affairs “IPE”
- Local Regulations
CHEMICAL MANAGEMENT: INDUSTRY CHALLENGES
Typical industry challenges – what the survey says

Key challenges identified in a survey (100+ respondents):

- Lack of effective comprehensive chemical management systems
  - Supply chain coverage & scalability
  - Lack of transparency / subcontracting
- Increasing regulations & voluntary standards (also multiple standards)
- Pressure from non-governmental organizations
- Poor management of hazardous chemicals & waste
- Poor chemical knowledge in supply chain
- Not enough trained & skilled resources
## Frequently Detected Groups (Recent Years)

<table>
<thead>
<tr>
<th>Major Testing Parameters</th>
<th>Incoming Water</th>
<th>Before Treatment Wastewater</th>
<th>After Treatment Wastewater</th>
<th>Sludge</th>
<th>Note:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1A) Conventional Parameters</td>
<td></td>
<td></td>
<td></td>
<td>Insufficient Information</td>
<td>Very Frequently Found</td>
</tr>
<tr>
<td>1B) Conventional Parameters – METALS</td>
<td></td>
<td></td>
<td></td>
<td>Insufficient Information</td>
<td>Frequently Found</td>
</tr>
<tr>
<td>2A) APs and APEOs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Quite Frequently Found</td>
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<tr>
<td>2B) Chlorobenzenes and Chlorotoluenes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A Few Instances Found</td>
</tr>
<tr>
<td>2C) Chlorophenols</td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>2D) Azo Dyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Very Frequently Found</td>
</tr>
<tr>
<td>2E) Carcinogenic Dyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; 70%</td>
</tr>
<tr>
<td>2F) Disperse Dyes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Frequently Found</td>
</tr>
<tr>
<td>2G) Flame Retardants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>~ 40 - 70%</td>
</tr>
<tr>
<td>Sub: Other Flame Retardants</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Quite Frequently Found</td>
</tr>
<tr>
<td>Sub: SCCPs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>~ 20% - 40%</td>
</tr>
<tr>
<td>2H) Glycols</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>A Few Instances Found</td>
</tr>
<tr>
<td>2I) Halogenated Solvents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&gt; 20%</td>
</tr>
<tr>
<td>2J) Organotin Compounds</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2K) Perfluorinated and Polyfluorinated Chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2L) Phthalates</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2M) Poly Aromatic Hydrocarbons</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2N) Volatile Organic Compounds</td>
<td></td>
<td></td>
<td></td>
<td>Insufficient Information</td>
<td></td>
</tr>
</tbody>
</table>

*Extracted from tested samples by BVCPS, not representative of the total actual situations*
Chemical management …
… our chemical discharge monitoring approach

**Key Benefits**

- Implementation of SMART objectives
- Clarity of requirements / expectations to supply chain
- Better understanding of increasing regulations and campaigns
- Identification of supply chain problematic areas and achievable outcomes -> targeted improvement plans
- Continuous improvement
- Total cost of quality and supply chain improvement
CDM Solution – Service Offering

Policy Deployment & Program Realization Timeline

Discuss and develop program time frame*

- Requirement Management
- Knowledge Translation
- Measurement
- Monitoring & Improvement

1-2 months

3rd month onwards

9th & 15th months

*The time frame represents a general case
**CDM – Product Mix**

<table>
<thead>
<tr>
<th>Requirement Management</th>
<th>Knowledge Translation</th>
<th>Measurement</th>
<th>Monitoring &amp; Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk Factory Comprehensive Approach</td>
<td>Mid Risk Factory Moderate Approach</td>
<td>Low Risk Factory Smart Approach</td>
<td></td>
</tr>
<tr>
<td>Risk Profiling</td>
<td>Risk Profiling</td>
<td>Risk Profiling</td>
<td></td>
</tr>
<tr>
<td>Supply Chain Tiering</td>
<td>Supply Chain Tiering</td>
<td>Supply Chain Tiering</td>
<td></td>
</tr>
<tr>
<td>Policy Deployment</td>
<td>Policy Deployment</td>
<td>Policy Deployment</td>
<td></td>
</tr>
<tr>
<td>Longer time frame</td>
<td>Shorter time frame</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Sustainability & ZDHC / Detox latest update**
- Chemical Management
- Product Risk Review

**Before program starts & Every 6 months after program starts**

**FCMS Audit**
- BVE³ Enrollment & Implementation
  - Monthly

**Testing**
- Incoming / Waste Water / Sludge Testing
- Chemical / Raw Material Testing
- Finished Goods Testing & Trend (Regulatory Compliance)
- ZDHC Chemical Management Audit

**BVE³**
- Trend / Sustainability Index Review & Recommend Follow Up Actions Accordingly
  - Yearly

**Sustainability Scores & Benchmarking against Industry Trend**

**Risk Profiling**
- ZDHC Chemical Management Audit

**BVE³**
- Trend / Sustainability Index Review & Recommend Follow Up Actions Accordingly
  - Every 6-12 months

**Supply Chain Tiering**

**Testing**
- Optional
  - Every 6-12 months

**BVE³ Enrollment & Implementation**
- Monthly

**ZDHC Chemical Management Audit**

**BVE³**
- Every 12 months

**Sustainability Scores & Benchmarking against Industry Trend**

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**Incoming / Waste Water / Sludge Testing**

**Chemical / Raw Material Testing**

**Finished Goods Testing & Trend (Regulatory Compliance)**

---

**Every 3-6 months**

**Every 6-12 months**

**Yearly**

---

Bureau Veritas CPS Solution: CDM & BVE3 Service Offering (Ver.1.0)
CDM SOLUTION: INTRODUCING BVE³
BVE³ is on-line platform specially designed for industry with wet processing.

Addresses insufficient chemical discharge information of factories with one time water testing / or screening of materials and manufacturing chemicals.

It is a supplementary tool, works with chemicals screening, testing and factory audit for greater supply chain visibility.

BVE³ constructs realistic discharge scenarios for the hazardous substances used along the manufacturing process and release to the environment (waste water discharge) from the factories.

The design concept (leveraging Pollutant Release and Transfer Registers (PRTRs)) and Mass Balance used in the model is valid and validated.
BVE³: Technically Endorsed

➢ “BVE³ is the only commercial model available that can systematically estimate the discharge scenarios of multiple pollutants for the textile processing industry.”

➢ “…created based on the most up to date and authoritative emission scenario document …”

➢ “In addition to its good algorithm and module design, the BVE³ generates effective estimations for discharge.”

➢ “… BVE³ provides a very economical way to estimate the discharge scenarios in the textile processing industry.”

➢ “I strongly recommend the BVE³ to textile processing plants to construct their discharge scenarios and to users in other industries to develop their corresponding models based on the successful BVE³ platform.”
BVE³ : How it Works?

➢ Factories uploading chemical information to BVE³ on a monthly basis.

➢ Bureau Veritas’ specialists analyze factories’ inputs and the calculated output results in the estimated concentration and amount of hazardous substances in water discharge.

➢ The number and the amount of hazardous substances in the chemical inventory and discharge create 3 indexes to help measuring factories’ chemical management performance:

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency Index</td>
<td>A measurement of the declared chemicals within the chemical inventory and the quality of Material Safety Data Sheet (MSDS)</td>
</tr>
<tr>
<td>Greener Chemical Usage Index</td>
<td>Provides an indication of the proportion of chemicals declared under the Chemical Inventory List (CIL) used in the manufacturing process that qualify them as hazardous substances free (defined under MSDS)</td>
</tr>
<tr>
<td>Clean Emission Index</td>
<td>Represents the level of hazardous substances free discharge during the manufacturing process</td>
</tr>
</tbody>
</table>
BVE³: Input Output Workflow

- Chemical Inventory
- MSDS Collection
- Training
- Chemical Inventory Log
- Estimation of Water Consumption

- Application of User ID / Password
- User ID / Password Authorization

- CIL Review
- New Chemical Registration
- Emission Calculation

- Emission Calculated Reports & Comparison
- Report interpretation and sources of hazardous substances identification
- Hazardous substances replacement recommendation

- Reports for Brand
- Reports for Mill

- Business Intelligence report for Brand / Retailers
- Business Intelligence report for Mills / Production unit

- Training
- Chemical Inventory Log
- Estimation of Water Consumption
- Emission Calculated Reports & Comparison
- Report interpretation and sources of hazardous substances identification
- Hazardous substances replacement recommendation

- Reports for Brand
- Reports for Mill

- Business Intelligence report for Brand / Retailers
- Business Intelligence report for Mills / Production unit
BV E3 - Case study: Factory “A” – dyeing and printing

After using BVE³, follow-up actions according to BV’s recommendation

- Identified source chemicals of hazardous substances
- Reduced consumption of hazardous chemicals
- Explored “Greener” alternatives

✓ Hazardous substance reduction exhibits significant improvement
Case study: Factory “A” – dyeing and printing

<table>
<thead>
<tr>
<th>Index</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency Index</td>
<td>A measurement of the declared chemicals within the chemical inventory and the quality of Material Safety Data Sheet (MSDS)</td>
<td>1.67%</td>
</tr>
<tr>
<td>Greener Chemical Usage Index</td>
<td>Provides an indication of the proportion of chemicals declared under the Chemical Inventory List (CIL) used in the manufacturing process that qualify them as hazardous substances free (defined under MSDS)</td>
<td>38.5%</td>
</tr>
<tr>
<td>Clean Emission Index</td>
<td>Represents the level of hazardous substances free discharge during the manufacturing process</td>
<td>35.85%</td>
</tr>
</tbody>
</table>
Case study: Factory “A” – dyeing and printing

Provide compliance information: whether detected chemicals are in lists brands commit to

<table>
<thead>
<tr>
<th>Substances Name According CIL</th>
<th>Official Substance Chemical Name</th>
<th>CAS No.</th>
<th>EC No.</th>
<th>Included in below list (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acetic acid</td>
<td>Acetic acid</td>
<td>64-19-7</td>
<td>200-580-7</td>
<td>No</td>
</tr>
<tr>
<td>Ammonium acetate</td>
<td>Ammonium acetate</td>
<td>631-61-8</td>
<td>211-162-9</td>
<td>No</td>
</tr>
<tr>
<td>Boric acid</td>
<td>boric acid</td>
<td>10043-35-3</td>
<td>233-139-2</td>
<td>No</td>
</tr>
<tr>
<td>Carbon</td>
<td>Carbon black</td>
<td>1333-86-4</td>
<td>215-609-9</td>
<td>No</td>
</tr>
<tr>
<td>Citric Acid monohydrate</td>
<td>Citric acid monohydrate</td>
<td>5949-29-1</td>
<td>Nil</td>
<td>No</td>
</tr>
</tbody>
</table>

Source tracking

<table>
<thead>
<tr>
<th>Chemical Supplier Name</th>
<th>Chemical Product Name</th>
<th>Preparation Name</th>
<th>Chemical Usage Type</th>
<th>Consumption (Kg)</th>
<th>Chemical Substance</th>
<th>Official Substance Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supplier A</td>
<td>Nebula Reactive Grey</td>
<td>Nebula Reactive Grey</td>
<td>Printing</td>
<td>10.00</td>
<td>boric acid</td>
<td>boric acid</td>
</tr>
<tr>
<td>Supplier A</td>
<td>Nebula Reactive Yellow</td>
<td>Nebula Reactive Yellow</td>
<td>Printing</td>
<td>10.00</td>
<td>boric acid</td>
<td>boric acid</td>
</tr>
<tr>
<td>Supplier A</td>
<td>Nebula Reactive Red</td>
<td>Nebula Reactive Red</td>
<td>Printing</td>
<td>10.00</td>
<td>boric acid</td>
<td>boric acid</td>
</tr>
<tr>
<td>Supplier A</td>
<td>Nebula Reactive Orange</td>
<td>Nebula Reactive Orange</td>
<td>Printing</td>
<td>10.00</td>
<td>boric acid</td>
<td>boric acid</td>
</tr>
<tr>
<td>Supplier A</td>
<td>Nebula Reactive Blue</td>
<td>Nebula Reactive Blue</td>
<td>Dyeing</td>
<td>10.00</td>
<td>boric acid</td>
<td>boric acid</td>
</tr>
</tbody>
</table>

✓ **Boric acid** is detected in a few chemicals provided by chemical supplier A
✓ It is highly recommended to use another chemical to replace above.
➢ A sustainable cost effective solution which can help providing a full visibility on supply chain for continuous improvement.

- Identifying hazardous substances proactively
- Helping factory to substitute the hazardous chemicals with other alternative chemicals, avoiding potential recall and loss
- Hazardous substance restricted by client’s RSL&MRSL, ZDHC MRSL, SVHC& Detox are also identified

➢ Optimization of resources to achieve Compliance
➢ Improve chemical inventory management
QUESTIONS & ANSWERS

Move Forward with Confidence
LOOKING TO THE FUTURE: DETOXING YOUR SUPPLY CHAIN

Kathrin Endress
Director, Technical Competence Center for Textiles
TÜV Rheinland

Moderator: Nate Herman, Senior Vice President, Supply Chain, AAFA
CLOSING REMARKS

Nate Herman
Senior Vice President, Supply Chain
AAFA
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