Restricted Substances List

Lisa Clerici, Sr. Manager Global Restricted Substances | **Under Armour**

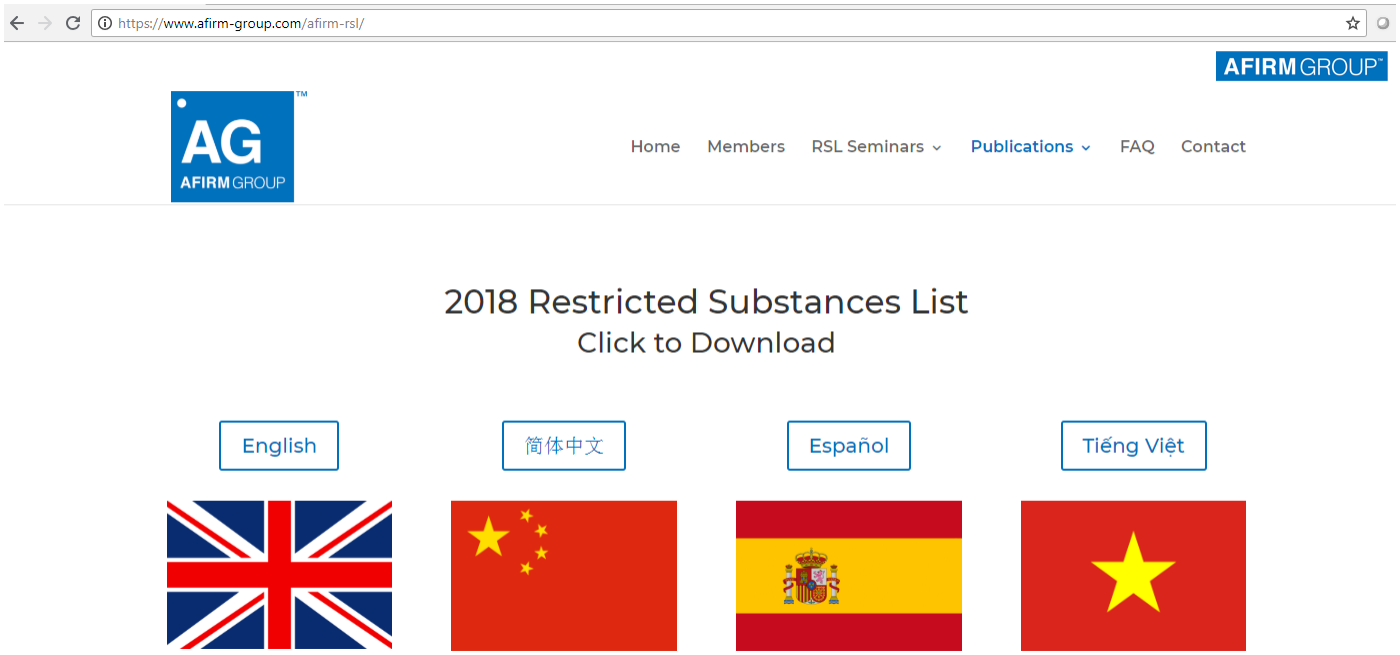
Restricted Substances List

- Version 1 published in 2015
- New version published annually (every January)
- Version 3 (2018) currently posted
- Many, but not all, AFIRM brands have adopted

CHECK BRAND SPECIFIC REQUIREMENTS

Restricted Substances List

Available on AFIRM website:
https://www.afirm-group.com/afirm-rsl/



Restricted Substances List

Change Log for the 2018 AFIRM RSL

CAS No.	Substance	Modification	Page
Various	Acidic and alkaline substances (pH)	Added pH limits and methods for textiles and leather.	13
Various	Alkylphenols (AP)	Added test method for NP/OP: Extraction: 1 g sample/20 mL THF, sonication for 60 minutes at 70 degrees C	14
Various	Azo-amines	Changed test method for textiles to EN ISO 14362-1:2017 and EN ISO 14362-3:2017 for p-Aminoazobenzene.	15
85535-84-8 85535-84-9	Chlorinated Paraffins	Changed test method to combined CADS/ISO 18219:2015 method V1:06/17 (extraction by ISO 18219 and analysis by GC-NCI-MS).	16
875-40-1	Chlororganic Carriers	Added 2,3,4,6-Tetrachlorotoluene	17
1006-31-1		Corrected CAS number for 2,3,5,6-Tetrachlorotoluene	
Various	Dyes, Forbidden and Disperse	Changed limit to 50 ppm each.	19–20
118685-33-9 Not Allocated	Dyes, Navy Blue	Changed limit to 50 ppm each.	20
Various	Flame Retardants	Changed method to EN ISO 17881-1, -2:2016; changed limit to 10 ppm each. All organohalogen flame retardants restricted, including all PBDEs.	21
Various	Heavy Metals	Changed extractable methods to Textiles: DIN EN 16711-2:2016; Leather: DIN EN ISO 17072-1:2017 Changed total content methods to Textiles: DIN EN 16711-1:2016; Leather: DIN EN ISO 17072-2:2017	22–24
7440-43-9	Heavy Metals, Cadmium (Cd)	Changed limit to 40 ppm for all ages.	22
7440-47-3	Heavy Metals, Chromium (Cr)	Changed extractable limit for textiles to 2 ppm.	23
18540-29-9	Heavy Metals, Chromium VI	Added leather extractable measurement method EN ISO 17075-2:2015 in cases of color interference. Changed textiles method to DIN EN 16711-2:2016 with EN ISO 17075-1:2017 if Cr is detected.	23
7440-48-4	Heavy Metals, Cobalt (Co)	Changed extractable limit for adults to 4 ppm.	23
7440-50-8	Heavy Metals, Copper (Cu)	Changed extractable limit for adults to 50 ppm.	23
75-01-4	Monomers	Added Vinyl Chloride with a limit of 1 ppm and test method EN ISO 6401:2008.	24
Various	N-Nitrosamines	Added LC/MS/MS verification method if positive GC/MS result. Alternatively, LC/MS/MS may be performed on its own. Added method prEN 19577, 2017.	25
Various	Organotins	Specified Tri-substituted Organotins: TCyHT, TMT, TOT, and TPT.	25
90-43-7	Ortho-phenylphenol (OPP)	Changed method to 1 M KOH extraction, 12-15 hours at 90 degrees C, derivatization and analysis § 64 LFGB B 82.02-08 or DIN EN ISO 17070:2015	25
Various	Ozone-depleting Substances	Added limit of 5 ppm each.	26
Various	Phthalates	Modified list to include restricted Phthalates only. Removed REACH SVHCs Phthalates, which are covered by general provisions. Added DPENP and DCHP based on new regulation by the U.S. CPSC.	27
Various	Volatile Organic Compounds	Added Carbon Disulfide, Cyclohexanone, and Ethylbenzene	29
Various	Pesticides, Agricultural	Removed Hexabromobiphenyl, Parathion, Pentabromobenzene, and Permethrin	30

Change log will include:

- Add or delete substance(s)
- Change to limit
- Change to test method

Change log will not include:

- Fixing typos
- Minor changes
- Change to reporting limits
- Change to test method year

Restricted Substances List

- Added Reporting Limits (values above which labs should report detected substances for purposes of data capture and harmonization)
- Added link to Chemical Information Sheets

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Textile Processing for Apparel & Footwear	Suitable Test Method Sample Preparation & Measurement	Reporting Limit Limits above which test results should be reported
	Acetophenone and 2-Phenyl-2-Propanol +				
98-86-2	Acetophenone	50 ppm each	Potential breakdown products in EVA foam when using dicumyl peroxide as a cross-linking agent.	Extraction in acetone or methanol GC/MS, sonication for 30 minutes at 60 degrees C	25 ppm
617-94-7	2-Phenyl-2-Propanol				
	Acidic and Alkaline Substances				
Various	pH value	Textiles: 4.0–7.5 Leather: 3.5–7.0	pH value is a characteristic number, ranging from pH 1 to pH 14, which indirectly shows the content of acidic or alkaline substances in a product. pH values less than 7 indicate sources of acidic substances, and values greater than 7 indicate sources of alkaline substances. To avoid irritation or chemical burns to the skin, the pH value of products must be in the range of human skin—approximately pH 5.5. AFIRM recommends the limits cited to comply with all global regulations for all products.	Textiles: EN ISO 3071:2006 (KCl Solution) Leather: EN ISO 4045:2008	N/A

Restricted Substances List

What's Next?

- Clarification of scope of products covered (apparel, footwear, accessories, sporting goods)
- Definition of material types with examples (eg blended fibers, polymers, etc)
- Conversion of risk matrix to test matrix

Substance	Natural Fibers	Blended Fibers	Synthetic Fibers	Artificial Leather With fiber backing	Natural Leather	Coatings & Prints	Natural Materials Including horns, bones, cork, wood, paper, and straw	Polymers, Plastics, Foams, Natural Rubber & Synthetic Rubber[C]	Metal	Feathers & Down	Glue
Acetophenone and 2-Phenyl-2-Propanol								2[A]			
Acidic and Alkaline Substances (pH)	1	1	1	1	1						
Alkylphenol (AP) and Alkylphenol Ethoxylates (APEOs), including all isomers	1	1	1	1	1	1	1	1		3	1
Azo-amines	1	1	1	1	1	1	1			1	
Bisphenol-A								3[B]			

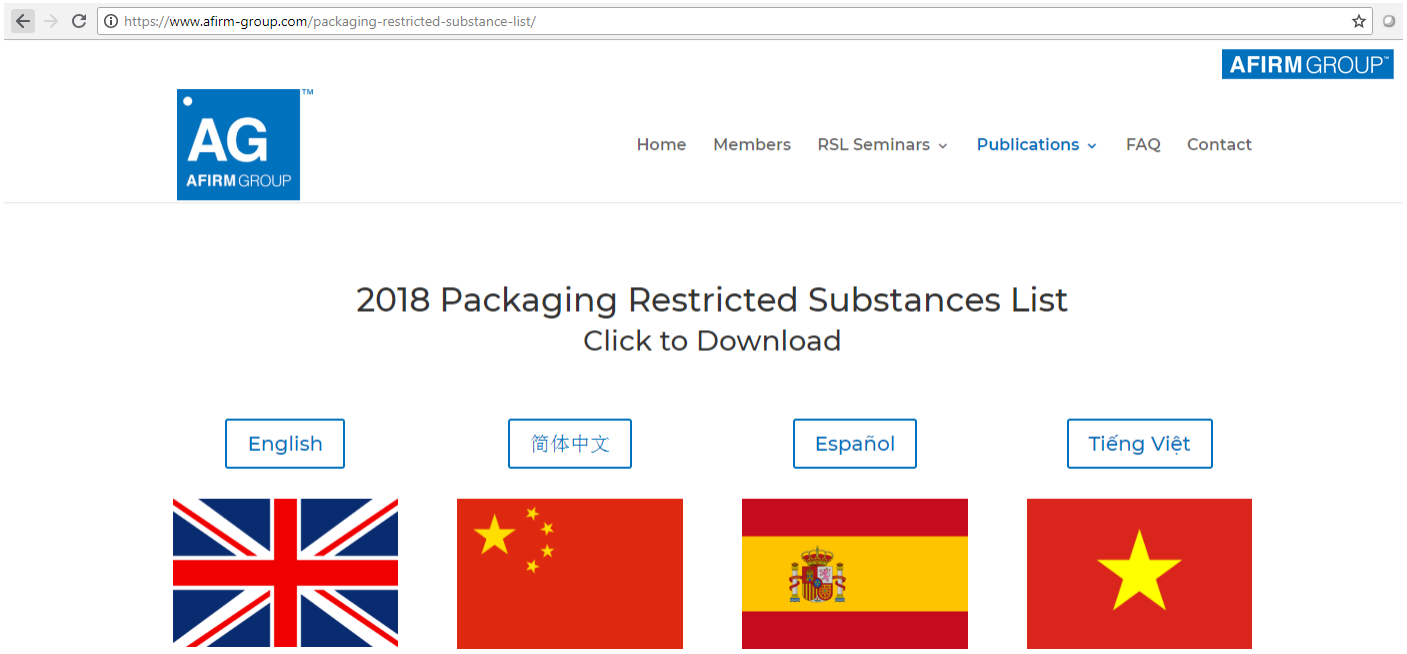
Packaging Restricted Substances List

- First collaborative Packaging RSL in the industry
- Version 1 took a conservative approach
- New version published annually (every January)
- Will take time for brands to adopt

CHECK BRAND SPECIFIC REQUIREMENTS

Packaging Restricted Substances List

Available on AFIRM website:
https://www.afirm-group.com/packaging-restricted-substance-list/



Packaging Restricted Substances List

Same format as Product RSL

CAS No.	Substance	Limits Raw Material & Finished Product	Potential Uses Processing for Packaging Materials	Suitable Test Method Sample Preparation & Measurement	Reporting Limit Limits Above Which Test Results Should Be Reported
	Butylated Hydroxytoluene (BHT)				
128-37-0	Dibutylhydroxytoluene (BHT)	25 ppm	Used as an additive in plastics as an antioxidant to prevent aging. Can cause phenolic yellowing of textiles.	ASTM D4275	5 ppm
	Bisphenol-A ✣				
80-05-7	Bisphenol-A (BPA)	1 ppm	Used in the production of epoxy resins, polycarbonate plastics, flame retardants, and PVC. It is often used as a coating in thermal receipt paper as a developer.	Sample preparation: Extraction: 1 g sample/20 ml methanol, sonication for 60 minutes at 70 degrees C Measurement: DIN EN ISO 18857-2:2011 (mod)	1 ppm
	Dimethylfumarate ✣				
624-49-7	Dimethylfumarate (DMFu)	0.1 ppm	DMFu is an anti-mold agent used in sachets in packaging to prevent the buildup of mold, especially during shipping.	CEN ISO/TS 16186:2012	0.05 ppm

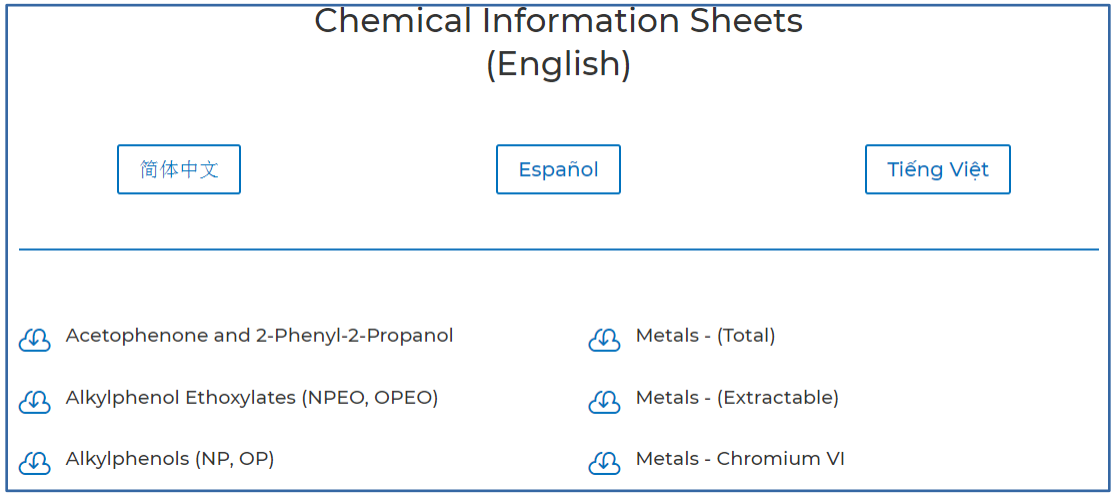
Packaging Restricted Substances List

Scope of packaging materials covered under Packaging RSL

Paper & Wood	Plastic & Wrap	Finishing, Dyes, Inks & Coatings	Metal	Textiles	Other Items
• Boxes/cartons • Corrugated shipping boxes/cartons • Gift boxes • Hang tags • J board • Labels, adhesive • Stuffing • Tissue paper • UPC tags • Stickers • Tape • Thermal receipt paper	• Boxes, single pack and multi-pack • Hang tags • Plastic cases • Poly bags • Poly bags, zippered • Price tags • Retail carry bags • Stickers • Tape	• Cellulose laminates • Coatings containing heavy metals • Foil stamping • Hot-stamp printing • Lamination, matte or gloss • Soft-touch coatings • Spot UV • Uncoated • UV coatings • Varnish coatings • Water-based (aqueous) lacquer coatings	• Magnets • Bead chain • Eyelets/grommets • Pins • Zippers	• Synthetic textiles • Plant-based textiles • Natural fibers (i.e. silk, wool)	• Silica gel/desiccant sachets • Antimicrobial stickers • Stuffing materials, expanded foam materials

Packaging is defined as all products made of any materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods, from the producer to the user or consumer.

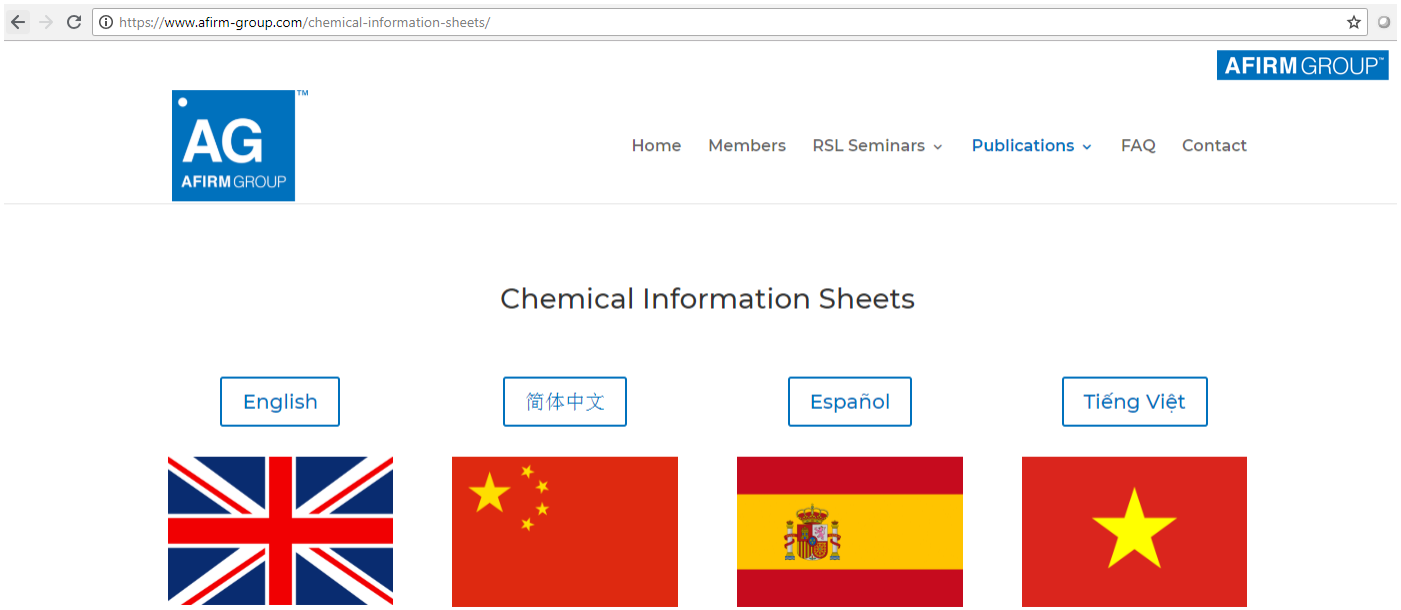
Chemical Information Sheets



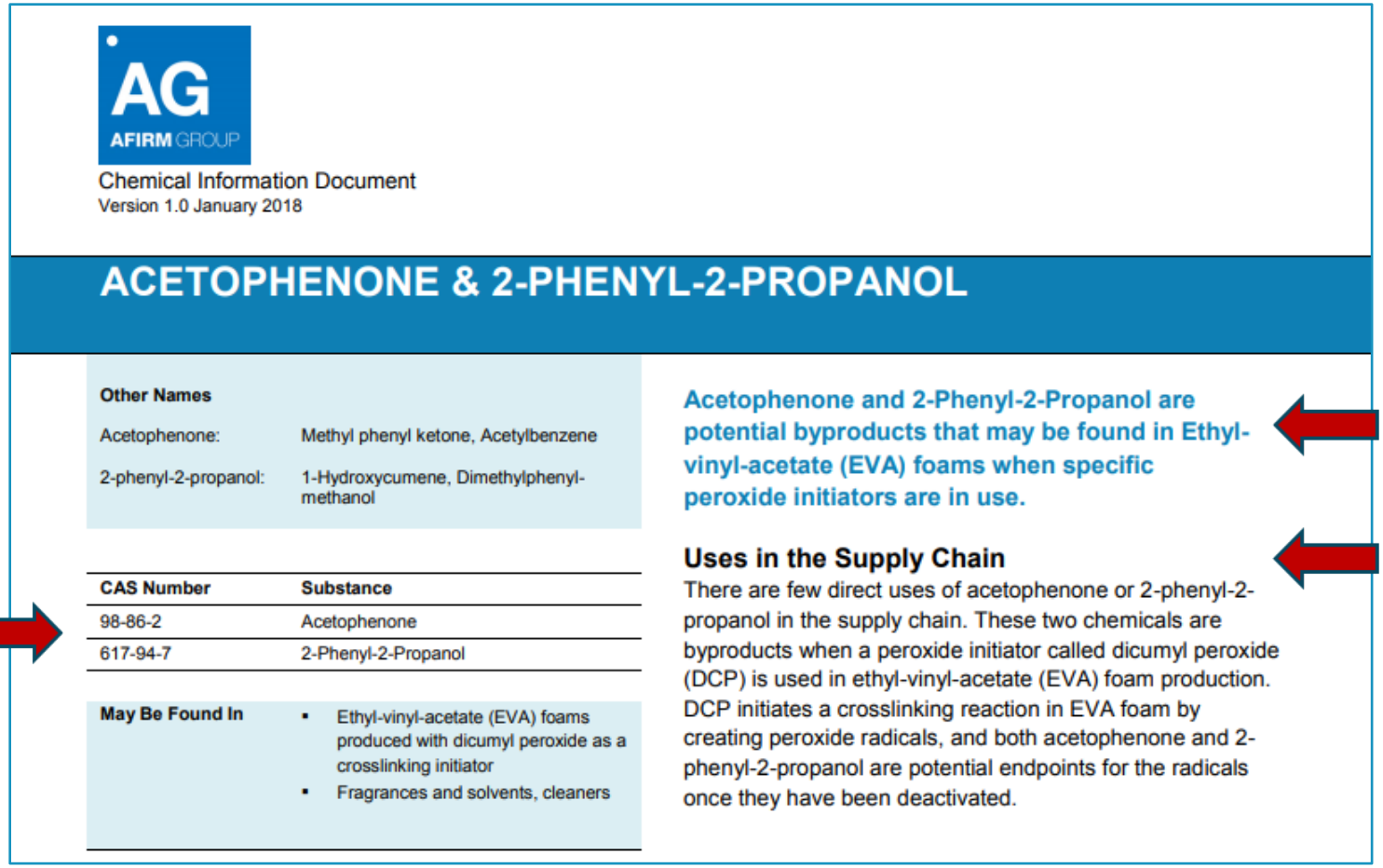
- Published in 2017
- Separate/multiple sheets for each chemical group
- Updated periodically
- Will be updated to include packaging for 2019 release

Chemical Information Sheets

Available on AFIRM website:
https://www.afirm-group.com/chemical-information-sheets/



Chemical Information Sheets



AFIRM GROUP

Chemical Information Document
Version 1.0 January 2018

ACETOPHENONE & 2-PHENYL-2-PROPANOL

Other Names

Acetophenone:	Methyl phenyl ketone, Acetylbenzene
2-phenyl-2-propanol:	1-Hydroxycumene, Dimethylphenyl-methanol

CAS Number	Substance
98-86-2	Acetophenone
617-94-7	2-Phenyl-2-Propanol

May Be Found In

- Ethyl-vinyl-acetate (EVA) foams produced with dicumyl peroxide as a crosslinking initiator
- Fragrances and solvents, cleaners

Acetophenone and 2-Phenyl-2-Propanol are potential byproducts that may be found in Ethyl-vinyl-acetate (EVA) foams when specific peroxide initiators are in use.

Uses in the Supply Chain

There are few direct uses of acetophenone or 2-phenyl-2-propanol in the supply chain. These two chemicals are byproducts when a peroxide initiator called dicumyl peroxide (DCP) is used in ethyl-vinyl-acetate (EVA) foam production. DCP initiates a crosslinking reaction in EVA foam by creating peroxide radicals, and both acetophenone and 2-phenyl-2-propanol are potential endpoints for the radicals once they have been deactivated.

Chemical Information Sheets

Why Acetophenone & 2-Phenyl-2-Propanol are Restricted

- Neither of these chemicals is legally regulated in finished products at this time, but multiple brand RSLs and the AFIRM RSL restrict these chemicals.
- The German Federal Institute for Risk Assessment (BfR) has written a comment about Acetophenone and 2-Phenyl-2-Propanol: 2-Phenyl-2-Propanol can potentially cause allergenic reactions. There are complaints by German authority labs when these substances are found in high concentrations in shoes.
- Acetophenone has a sweet pungent odor of orange blossom or jasmine, with an odor threshold of about 0.83 milligrams per cubic meter (mg/m^3)[1].
- AFIRM has voluntarily restricted acetophenone and 2-phenyl-2 propanol due to this odor which has prompted concerns from some enforcement agencies.[2]
- Acetophenone is classified as:
  - Acute Tox 4 - H302
  - Eye Irrit. 2 - H319
- 2-Phenyl-2-propanol is classified as: No classification at this time

Sourcing Compliant Materials from Your Suppliers

- EVA polymers created using DCP as a crosslinker may contain some level of acetophenone and 2-phenyl-2-propanol. Engaging in a conversation with your material supplier to discuss this issue is the best way to procure materials with the lowest levels of Acetophenone and 2-phenyl-2-propanol possible.

Chemical Information Sheets

Sourcing Compliant Formulations from Your Chemical Suppliers

- In this special case, there is no "compliant formulation" that can be sourced. Rather, to avoid the creation of acetophenone and 2-phenyl-2-propanol, a different manufacturing approach that utilizes a crosslinking agent other than DCP would need to be utilized. Caution should be used if an alternative to DCP is used, as some available alternatives are suspected of creating more hazardous byproducts.
- While it may be possible to reduce the amount of the byproducts with stringent processing controls, it is unlikely that a complete absence of these two chemistries will be achieved when DCP is used.

Safer Alternatives

There are alternative recipes for creating EVA polymers that do not require DCP for use as a cross-linker, but each has the potential to create other additional byproducts and should be carefully reviewed.

Additional Information

Visit ECHA's Candidate List of substances of very high concern to view dossiers for many restricted substances https://echa.europa.eu/candidate-list-table.

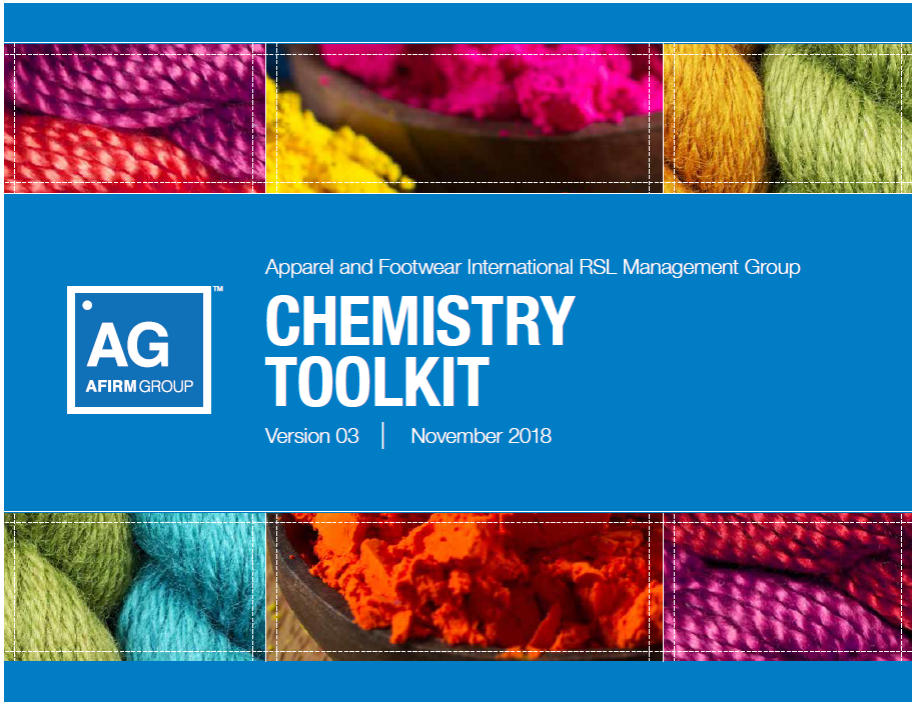
References

[1] United States Environmental Protection Agency. (2000). *Acetophenone*. Retrieved from https://www.epa.gov/sites/production/files/2016-09/documents/acetophenone.pdf

[2] Apparel and Footwear International RSL Management Group (Ed.). (2018, January 31). Restricted Substances List Retrieved http://afirm-group.com/afirm-rsl/

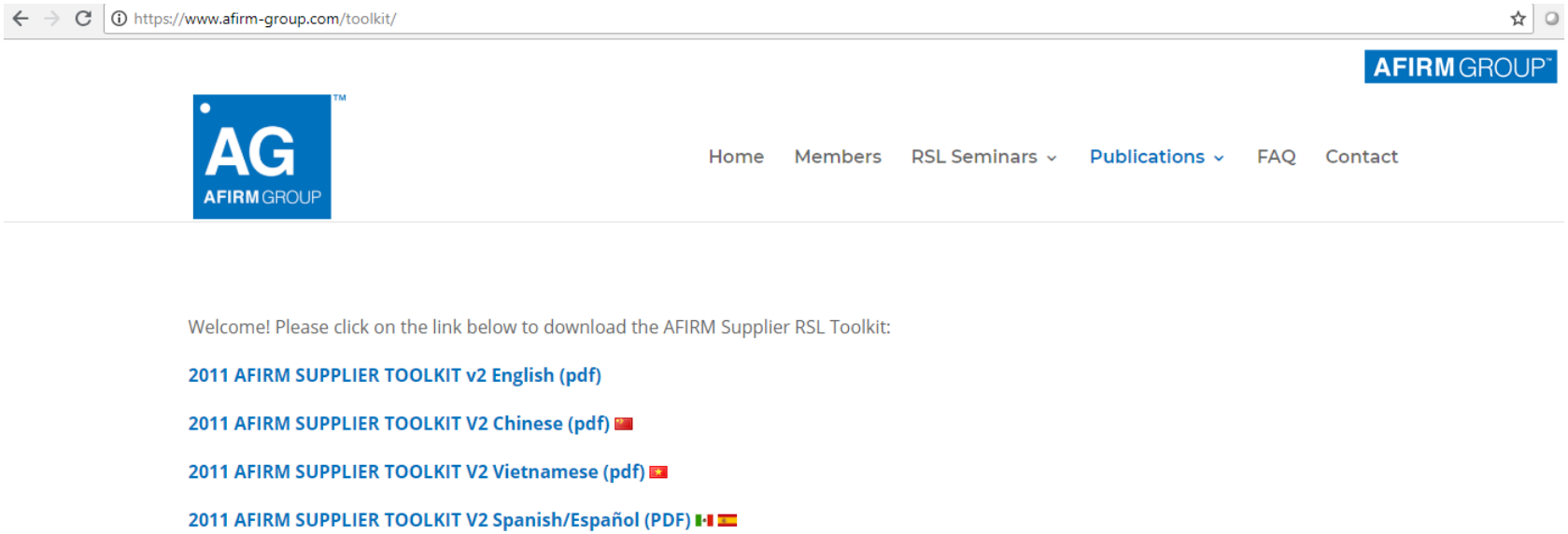
Supplier Toolkit

- Last version published in 2011
- Contains a lot of valuable information but can be difficult to navigate
- Due to volume of information and resources, keys areas were updated in 2018 with remainder to come in 2020



Supplier Toolkit

Available on AFIRM website:
https://www.afirm-group.com/toolkit/



Supplier Toolkit

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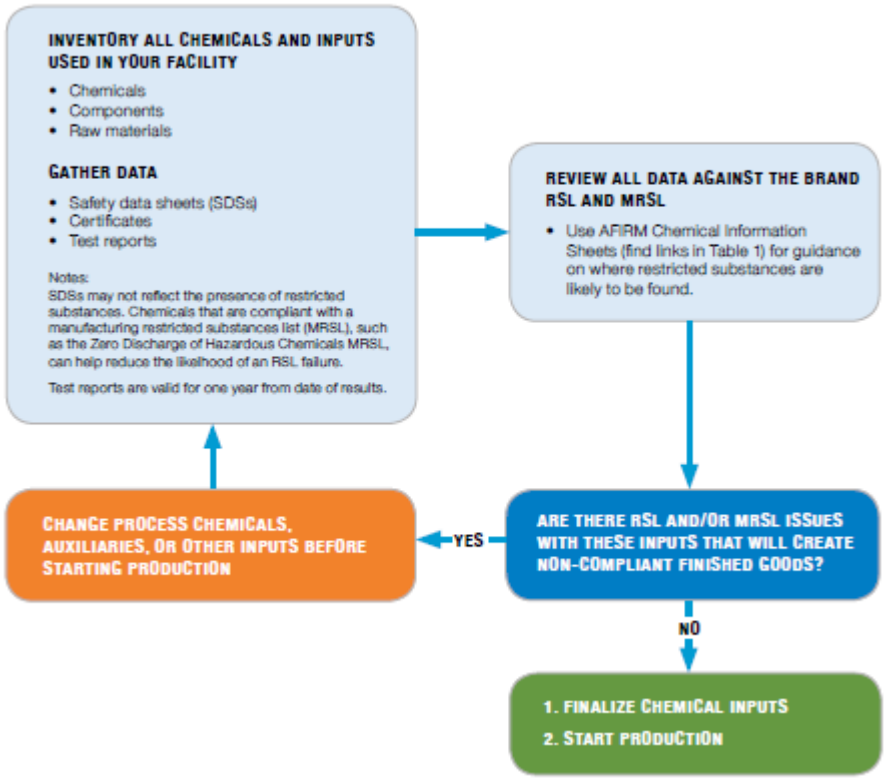
Supplier Toolkit

Where are the risks?

- Brief outline of steps to take to prevent RSL failures

Figure 1. Understanding Chemical Risks



Supplier Toolkit

Background on Restricted Substances

- Links to each Chemical Information Sheet

Substance	Language	Substance	Language
Acetophenone and 2-Phenyl-2-Propanol		Heavy Metals, Total	
Alkylphenol Ethoxylates (NPEO, OPEO)		Heavy Metals, Extractable	
Alkylphenols (NP, OP)		Heavy Metals, Chromium VI	
Azo-amines		Heavy Metals, Nickel Release	
Bisphenol-A		Monomers, Styrene and Vinyl Chloride	
Chlorinated Paraffins, SCCP (C10-C13) and MCCP (C14-C17)		*N*-Nitrosamines	
Chlorophenols (Tri-, Tetra-, and Pentachlorophenols)		Organotin Compounds	
Chlororganic Carriers		Ortho-phenylphenol (OPP)	
Dimethylformamide (DMFa)		Ozone-depleting Substances	
Dimethylfumarate (DMFu)		Perfluorinated and Polyfluorinated Chemicals (PFCs)	
Dyes: Acid, Basic, Direct, Other, Navy Blue		Pesticides, Agricultural	
Dyes: Disperse		Phthalates	
Flame Retardants		Polycyclic Aromatic Hydrocarbons (PAHs)	
Fluorinated Greenhouse Gases		Volatile Organic Compounds (VOCs)	
Formaldehyde			

Supplier Toolkit

Educate the Supply Chain

- Process for educating your supply chain

Figure 2. Implementing a Robust RSL Policy Across the Supply Chain

Supplier Toolkit

RSL Implementation

- How to establish an RSL program

Communicating with Upstream Vendors

AFIRM suggests the following process for educating your own supply chain:

1. **Communicate all RSL and testing requirements to upstream vendors.**

   Ensure all subcontractors, accessory suppliers, dye mills, print mills, tanneries, chemical suppliers, etc. are aware of the brand's RSL requirements and have the latest version of the brand RSL on hand.

   See Appendices A and B for tips on how to establish a strategy for RSL management as well as a testing program.

2. **Use and encourage the use of chemistries from reputable manufacturers only.**

   Good resources include:

   - Ecological Toxicological Association of Dyestuffs www.etad.com
   - bluesign® www.bluesign.com

3. **Insist that chemical suppliers provide safety data sheets (SDSs) for dyes and textile auxiliaries.**

   SDSs may help reveal whether the materials contain restricted substances.

   See Appendix H for an overview and examples of SDSs.

4. **Make an effort to understand chemistries in use and where restricted substances may be found in the apparel and footwear supply chain.**

   See Figure 1 and Table 1 above, as well as Appendix G, for more specific technical information about where various restricted substances are introduced during the manufacturing process.

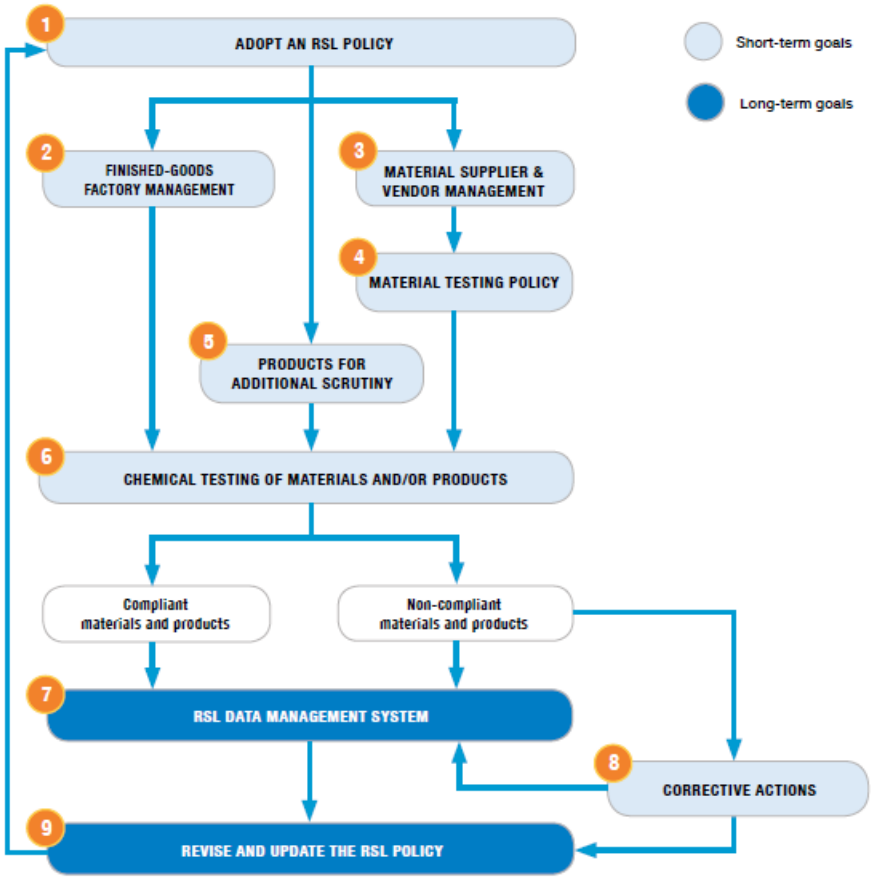
   Appendix D provides examples of RSL failures and the corrective actions taken to remediate them.

Supplier Toolkit

Strategy for RSL Management

- How to create an RSL compliance program

Figure 3. Implementing a Robust RSL Policy



Supplier Toolkit

RSL Failures and Corrective Action Examples

- Resource for common RSL failures and corrective actions

Alkylphenol Ethoxylates (APEOs)

FABRIC

Problem

APEOs were found on fabric in excess of the RSL limit.

Many scouring agents, which are used to remove oils and fats from textiles, contain APEOs as a surfactant.

There are many alternatives currently available without APEOs.

Corrective Actions

- Vendor sourced an APEO-alternative scour agent, with no cost increase.
- Brand communicated concern about APEOs to vendor.

SHOE INSOLE

Problem

APEO was detected in an insole board.

APEOs occur in many steps of the production process, as they are commonly found in surfactant-based chemistries.

Contamination from APEOs can be a common problem.

Corrective Actions

- Vendor sourced an APEO alternative scour agent with no cost increase.
- Brand communicated concern about APEOs with vendor.

LEATHER BAG

Problem

NPEO was detected in a pigskin handbag.

NPEOs are usually associated with degreasing agents.

Root Cause

- Due to a ban on raw material products from Japan, supplier had switched to a new degreasing agent for leather. This formula was found to contain NPEOs.

Corrective Action

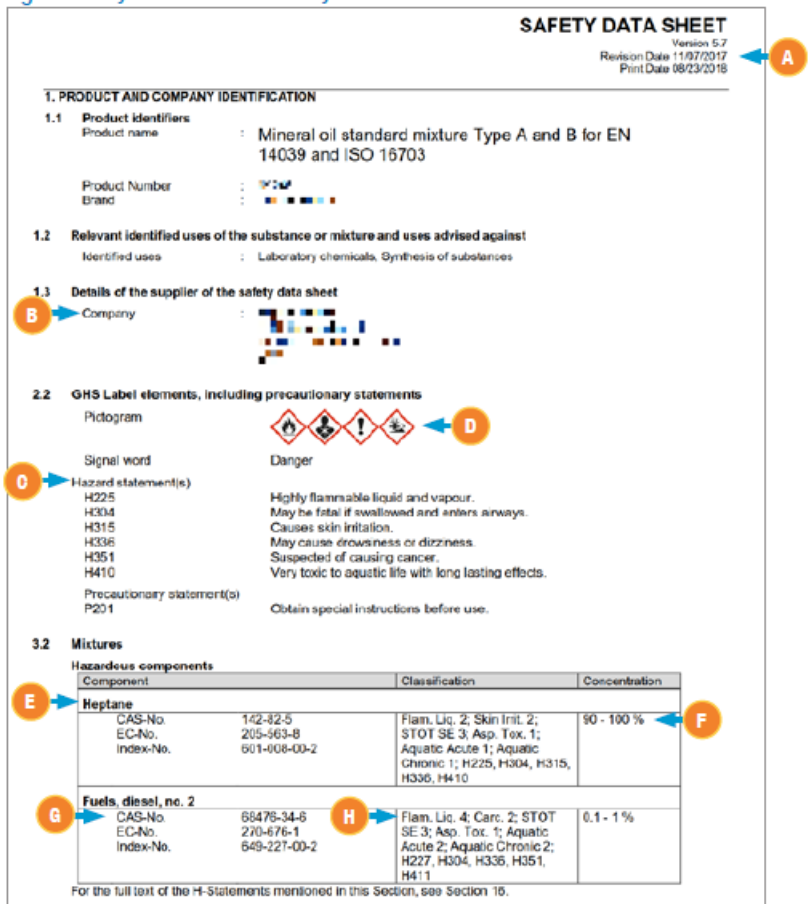
- Using the ZDHC chemical gateway, the supplier found a degreasing agent that complied with the ZDHC MRSL and did not contain NPEOs.

Supplier Toolkit

Safety Data Sheet (SDS)

- Outlines key elements of a good Safety Data Sheet

Figure 9. Key Elements of a Safety Data Sheet



SAFETY DATA SHEET

Version 5.7
Revision Date 11/07/2017
Print Date 08/23/2018

1. PRODUCT AND COMPANY IDENTIFICATION

1.1 Product identifiers

Product name : Mineral oil standard mixture Type A and B for EN 14039 and ISO 16703

Product Number :
Brand :

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Laboratory chemicals, Synthesis of substances

1.3 Details of the supplier of the safety data sheet

Company :

2.2 GHS Label elements, including precautionary statements

Pictogram

Signal word: Danger

Hazard statement(s)

H225	Highly flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H336	May cause drowsiness or dizziness.
H351	Suspected of causing cancer.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary statement(s)
P201 Obtain special instructions before use.

3.2 Mixtures

Hazardous components

Component		Classification	Concentration
Heptane			
CAS-No.	142-82-5	Flam. Liq. 2; Skin Irrit. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 1; Aquatic Chronic 1; H225, H304, H315, H336, H410	90 - 100 %
EC-No.	205-563-8		
Index-No.	601-008-00-2		
Fuels, diesel, no. 2			
CAS-No.	68476-34-6	Flam. Liq. 4; Carc. 2; STOT SE 3; Asp. Tox. 1; Aquatic Acute 2; Aquatic Chronic 2; H227, H304, H336, H351, H411	0.1 - 1 %
EC-No.	270-676-1		
Index-No.	649-227-00-2		

For the full text of the H-Statements mentioned in this Section, see Section 16.

BREAK

Break / Intermission

10:30 – 11:00

Please enjoy Tea, Coffee and Snacks in the Lobby