

HALOGENATED SOLVENTS

Class or Substance Name

Halogenated Solvents: Aliphatic Halogenated Solvents.

Substance List by CAS Number

Halogenated solvents are a large class of substances defined as aliphatic (straight chain or branched) compounds containing at least one halogen atom (typically chlorine). Aliphatic halogenated solvents potentially used in apparel and footwear production include:

107-06-2	1,2-dichloroethane
75-09-2	Methylene chloride
79-01-6	Trichloroethylene
127-18-4	Tetrachloroethylene

Description of Use in Apparel and Footwear

Certain halogenated solvents can be used in textile processing as a scouring solvent or carrier solvent for preparations and functional finishes. They may also be used as urethane foam blowing agents, chemical intermediates in dyes and pesticides, industrial cleaners (for example processing equipment, boilers) and spot cleaners.

Legislation around the world, including in the European Union, restricts the use of certain halogenated solvents. Leading apparel and footwear brands have banned the use of many halogenated solvents in the production of their products.

Why are Halogenated Solvents Restricted?¹

- Above certain levels, long-term exposure to some halogenated solvents may result in the development of particular cancers.
- Some halogenated solvents may cause serious damage to human health above certain exposure levels, especially through acute inhalation of high dosages.
- Some halogenated solvents can be toxic to aquatic organisms and above certain exposure levels may cause long-term adverse effects in the aquatic environment.

Guidance: Sourcing Halogenated Solvent-Compliant Materials from Your Material Suppliers (Textiles, Components and Trim Parts)

- Contact your suppliers and explain that you require materials with no intentionally added halogenated solvents.²
 - This includes textiles and leather with polymeric coatings or finishes, since halogenated solvents are common solvents used in coating, printing and finishing formulations.
 - Suppliers who use halogenated solvents for other clients or equipment cleaning may have contaminated machinery that can introduce halogenated solvents into their manufactured materials. Work with suppliers who have phased out the use of halogenated solvents for all clients and equipment cleaning.

HALOGENATED SOLVENTS MAY BE FOUND IN:

- Plastics
- Printing inks and paints
- Coatings
- Adhesives
- Solvents for textile processing
- Solvents for industrial cleaning (for example processing equipment, boiler)
- Solvents for spot cleaning
- Blowing agents for urethane foam

¹ Classification and risk phrases according to European Union Council Directive 67/548/EEC or Directive 1999/45/EC.

² Check with brands for their individual limits.

- Share this information sheet with your material suppliers and instruct them to work with their chemical suppliers to source halogenated solvent-compliant chemical formulations using the guidance in the next section.

Guidance: Sourcing Halogenated Solvent-Compliant Chemical Formulations from Your Chemical Suppliers

- Contact your chemical suppliers and explain that you require chemical formulations with no intentionally added halogenated solvents. The halogenated solvents of greatest concern in the production of apparel and footwear should meet the following formulation limits:³
 - 1,2-dichloroethane, CAS 107-06-2: 5 ppm (0.0005%)
 - Methylene chloride, CAS 75-09-2: 5 ppm (0.0005%)
 - Trichloroethylene, CAS 79-01-6: 40 ppm (0.004%)
 - Tetrachloroethylene, CAS 127-18-4: 5 ppm (0.0005%)
- Pay special attention to suppliers of formulations used for coating textile, natural leather⁴ and synthetic leather, since halogenated solvents are common ingredients. This includes printing pastes.
- Consider that halogenated solvents are common carrier solvents for many preparations and functional finishes.
- Halogenated solvents may be ingredients of industrial cleaners and spot removers used in apparel and footwear production facilities.
- Check the Material Safety Data Sheets (MSDS) of all chemical formulations to ensure that none of the halogenated solvent CAS Numbers above is listed as an ingredient.
- Have your chemical suppliers confirm that their chemical formulations meet the halogenated solvent limits with a certification or, if necessary⁵, by providing a test report from a third-party testing laboratory.
- Perform risk-based checks of your chemical suppliers' formulations by submitting samples to a third-party laboratory for testing to ensure the halogenated solvent limits are not exceeded.
- Discuss with your chemical supplier whether the below safer alternatives are suitable substitutes for your production needs.

Safer Halogenated Solvent Alternatives

Safer non-halogenated solvents are readily available for machinery cleaning, spot cleaning, textile processing, finishing, screen printing, foam production and degreasing. Your chemical supplier should be able to provide substitutes. Any chosen alternative must be ZDHC compliant.

³ Limits are taken from ZDHC Manufacturing Restricted Substances List (MRSL) (<http://www.roadmaptozero.com/df.php?file=pdf/MRSL.pdf>) and are the limits on unintended halogenated solvents in chemical formulations accepted by ZDHC member brands.

⁴ The ZDHC MRSL does not apply to chemical formulations intended for leather processing at this time.

⁵ At a later date, ZDHC will publish guidance on when testing of chemical formulations is appropriate.