



## Chlorophenols

Other Names: Chlorinated phenols

CAS Number	Substance
15950-66-0	2,3,4-trichlorophenol (2,3,4-TCP)
933-78-8	2,3,5-trichlorophenol (2,3,5-TCP)
933-75-5	2,3,6-trichlorophenol (2,3,6-TCP)

List continued in “Additional Information”

### May Be Found In:

- Preservatives for textile and leather materials
- Pesticides
- Dyes
- Print pastes

Chlorophenols are a group of man-made chemicals that have historically been used as, or converted into pesticides. They are also used as preservatives to protect leather and textile materials from fungal or bacterial growth during storage and transport. Chlorophenols have a strong, medicinal taste and smell.\*\*1\*\*

### Uses in the Supply Chain

Chlorophenols are commonly used as pesticides, or converted into them. Historically, they have been used as preservatives for textile and leather materials during storage and transport. Chlorophenols may also be present as impurities from raw materials used in the production of dyes. Some chlorophenols are used as preservatives in print pastes. They can be produced and found in wastewater after bleaching processes with elemental chlorine for textiles or paper, or during disinfection of wastewater or drinking water.

### Why Chlorophenols are Restricted

- Legislation in major markets around the world restricts the presence of some chlorophenols in final products.
- Many leading apparel and footwear brands have banned the use of chlorophenols in the production of their products.
- Above a certain exposure level, some chlorophenols can be toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
- Some chlorophenols have been classified as endocrine disruptors, affecting oestrogen levels and the thyroid.
- While more research is needed, agencies such as the EPA or the CDC consider some chlorophenols to be probable carcinogens.
- Above certain exposure levels, some chlorophenols are highly toxic when inhaled or absorbed through skin contact.<sup>1,2,3</sup>

### Sourcing Compliant Materials from Your Suppliers

- Explain that you require materials to be compliant with current AFIRM RSL limits.<sup>4</sup>
- Pay attention to natural textile or leather materials. Chlorophenols can be used as preservatives or pesticides.
- Request suppliers to submit a confirmation of material compliance and/or a test report from a third-party laboratory. When materials are received, consider performing random, risk-based testing to ensure current AFIRM RSL limits are met.
- Share this guidance sheet with your material suppliers. Using the guidance in the next section, instruct them to work with their chemical suppliers to source chemical formulations that comply with these requirements. If needed, highlight the existence of harmful substances in materials via chemical management trainings from the ZDHC Academy, existing guidelines, and laws.
- Make sure all your suppliers have a solid chemical management system in place.

## Sourcing Compliant Formulations from Your Chemical Formulators

- Explain to chemicals suppliers that you require chemical formulations to comply with current ZDHC MRSL limits.
  - Search for formulations on the ZDHC Gateway Chemical Module. If your preferred formulations are not listed, encourage providers to register their formulations.
  - Ask for a ZDHC ChemCheck report.
- Pay special attention to suppliers of chemicals used for preserving natural textiles and natural leather.
- For all formulations, request SDS documentation to ensure none of the CAS Numbers above are listed as ingredients.
- Discuss with your chemical formulators if any safer alternatives are available that are suitable substitutes for your production needs.

## Safer Alternatives

Substances are available that have been identified as safer alternatives and which may be suitable for your production needs. These substances are biocide preservatives and mould control products not containing chlorophenols. Any chosen alternatives must be ZDHC MRSL compliant. They must also be vetted by the brand you are working with prior to application. Restrictions on biocides vary between different brands and different markets.

In addition, proper storage and transport management will prevent conditions that allow mould to grow, minimising the need for preservative chemicals.

## Additional Information

Exploration of Management Options for Pentachlorophenol.<sup>5</sup>

Continued list of CAS Numbers and substance names from first page:

CAS Number	Substance
87-86-5	Pentachlorophenol (PCP)
576-24-9	2,3 - Dichlorophenol (2,3-DCP)
120-83-2	2,4 - Dichlorophenol (2,4-DCP)
583-78-8	2,5 - Dichlorophenol (2,5-DCP)
87-65-0	2,6 - Dichlorophenol (2,6-DCP)
95-77-2	3,4 - Dichlorophenol (3,4-DCP)
591-35-5	3,5 - Dichlorophenol (3,5-DCP)
95-57-8	2 - Chlorophenol
108-43-0	3 - Chlorophenol
106-48-9	4 - Chlorophenol
25167-83-3	TeCP mixed isomers
4901-51-3	2,3,4,5 - Tetrachlorophenol (2,3,4,5-TeCP)
58-90-2	2,3,4,6 - Tetrachlorophenol (2,3,4,6-TeCP)
935-95-5	2,3,5,6 - Tetrachlorophenol (2,3,5,6-TeCP)
15950-66-0	2,3,4 - Trichlorophenol (2,3,4-TriCP)
933-75-8	2,3,5 - Trichlorophenol (2,3,5-TriCP)
933-75-5	2,3,6 - Trichlorophenol (2,3,6-TriCP)
95-95-4	2,4,5 - Trichlorophenol (2,4,5-TriCP)
88-06-2	2,4,6 - Trichlorophenol (2,4,6-TriCP)
609-19-8	3,4,5 - Trichlorophenol (3,4,5-TriCP)

## References

- 1 Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological profile for chlorophenols. Retrieved <https://www.atsdr.cdc.gov/ToxProfiles/TP.asp?id=941&tid=195>.
- 2 Igbinosa, E., Odjadjare, E., Chigor, V., (March 2013) Toxicological Profile of Chlorophenols and Their Derivatives in the Environment: The Public Health Perspective. The Scientific World Journal, 2013(Article ID 460215), 11 pages. doi:10.1155/2013/460215 Retrieved <http://dx.doi.org/10.1155/2013/460215>.
- 3 Hohenstein Institute & Textile Exchange. (2017). Chemical Snapshots – Chlorophenols. Revision 0.2. Retrieved March 17, 2017.
- 4 Apparel and Footwear International RSL Management Group (Ed.). (2018, January 31). Restricted Substances List (Rep.). Retrieved <http://afirm-group.com/afirm-rsl/>.
- 5 <http://www.unece.org/fileadmin/DAM/env/lrtap/TaskForce/popsxg/2010/Exploration%20of%20management%20options%20for%20PCP,%20draft%20document%20..pdf>.

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