



QUINOLINE

Other Names Benzopyridine, Quinolin, Leucoline

CAS Number	Substance
91-22-5	Quinoline

May Be Found In

- Dispersing agents for disperse dyes as an impurity
- Polyester as an impurity
- Some cyanine dyestuffs (e.g., Disperse Yellow 54)

Quinoline is a colorless liquid with a strong odor. It is a contaminant in some dispersing agents for dyestuffs. Historically, some cyanine dyes are based on quinoline derivatives (e.g., Disperse Yellow 54), though cyanine dyes are rarely used any longer.

Uses in the Supply Chain

Quinoline can appear as a contaminant in dispersing agents. In order to aid the dyeing process, disperse and vat dyes are formulated with dispersing agents. Naphthalenesulfonate formaldehyde condensates are a commonly used class of dispersing agents. These condensates are manufactured from naphthalene, and a minor by-product in the processing of naphthalene is quinoline. This can carry through the manufacturing of the naphthalenesulfonate formaldehyde condensate dispersing agents. In addition to the manufacture of dispersing agents and dyes, quinoline also has biocidal properties and so may also be used as a fungicide.

Why Quinoline is Restricted

- Quinoline is classified as a carcinogenic substance.¹
- Quinoline has a high solubility in water and is toxic to aquatic life. This makes it of concern in manufacturing processes where the dyed textiles are washed. There is potential for harm to downstream aquatic life.
- Chemical hazard information for many chemicals can be found at the following external databases:
 - GESTIS Substance Database: [Here \(external link\)](#)
 - US National Library of Medicine: [Here \(external link\)](#)
 - US OSHA Occupational Chemical Database: [Here \(external link\)](#)

Sourcing Compliant Materials from Your Suppliers

- Since quinoline appears far upstream in the manufacture of other chemicals, it is usually difficult to determine if a supplier is knowingly using it or not.
- Contact your suppliers and explain that you require their manufactured materials to be compliant with the current AFIRM RSL limits.²
- Require suppliers to submit a confirmation of material compliance or a test report from a third-party laboratory.
- It is recommended that an initial series of chemical testing is performed on synthetic fabrics to see if residual quinoline is present. This risk-based testing is recommended to ensure the current AFIRM RSL limits are met.



Chemical Information Sheet

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- Communicate the AFIRM limits to your material vendors so that they can source compliant material from their upstream suppliers.

Sourcing Compliant Formulations from Your Chemical Suppliers

- For all formulations, request SDS documentation that meets current GHS requirements. Carefully read the SDS sheets to see if naphthalenesulfonate formaldehyde condensates or cyanine-based dyes are used.
- If purchasing dyes and inks, communicate the restrictions on Quinoline directly to the manufacturers so that they can supply you with low/non-quinoline based chemicals.
- Chemical testing of the dyes/inks/paints can give you confidence that their use will not result in non-compliant textiles.
- Prior to procuring any formulation, the chemical properties must be reviewed to ensure that proper protective equipment, chemical storage facilities, facility engineering controls, and associated treatment/disposal facilities are appropriate for the chemical(s).

Safer Alternatives

There are now multiple choices of dyestuffs formulated so as to eliminate the risk of restricted substances. Work with your dye manufacturers, dye houses, textile vendors and garment manufacturers to ensure they are using environmentally preferred chemistries.

Additional Information

- Human health risks due to exposure to inorganic and organic chemicals from textiles: A review. <https://www.sciencedirect.com/science/article/pii/S0013935118305140>
- Special thanks to Thomas Schäfer at bluesign for expert input on quinoline's prevalence in the industry.

References

¹ European Chemicals Agency – Quinoline. <https://echa.europa.eu/substance-information/-/substanceinfo/100.001.865>

² Apparel and Footwear International RSL Management Group Restricted Substances List (AFIRM RSL) <http://afirm-group.com/afirm-rsl/>