GUIDANCE SHEET

NONYLPHENOL ETHOXYLATES (NPEOs)

Class or Substance Name

Nonylphenol Ethoxylates (NPEOs; NPEs): Polyethylene glycol nonylphenyl ether

Substance List by CAS Number

NPEOs are a large class of substances. Commonly used NPEOs include:

9016-45-9 Poly (oxy-1,2-ethanediyl), *alpha*-(nonylphenyl)-*omega*-hydroxy-
26027-38-3 Poly (oxy-1,2-ethanediyl), *alpha*-(4-nonylphenyl)-*omega*-hydroxy-
37205-87-1 Poly (oxy-1,2-ethanediyl), *alpha*-(isononylphenyl)-*omega*-hydroxy-
68412-54-4 Poly (oxy-1,2-ethanediyl), *alpha*-(nonylphenyl)-*omega*-hydroxy-, branched
127087-87-0 Poly (oxy-1,2-ethanediyl), *alpha*-(4-nonylphenyl)-*omega*-hydroxy-, branched

Description of Use in Apparel and Footwear

NPEOs are common ingredients in many chemical formulations used to produce apparel and footwear materials. They are widely used as surfactants or emulsifiers in detergents, scouring agents, dye-dispersing agents, printing pastes, spinning oils and wetting agents.

Legislation around the world restricts the use of NPEOs. Pending legislation in the European Union aims to restrict them in textile products. Leading apparel and footwear brands have banned the use of NPEOs in production of their products.

NPEOs MAY BE FOUND IN:

- Industrial laundry detergent
- Scouring agents (e.g., wool and leather)
- Wetting agents
- Softeners
- Spinning oils (yarn and fabric)
- Emulsifier/dispersing agents for dyes and prints
- Impregnating agents
- Degreasing agents for leather hides
- Leather-finishing preparations
- De-gumming agents for silk production
- Dyes and pigment preparations
- Polyester padding
- Down/feather fillings
- Facility cleaning products

Why are NPEOs Restricted?[1]

- NPEOs degrade into nonylphenol (NP) in the environment.
- NP is very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
- NP, above certain exposure levels, may impair human fertility and cause harm to unborn children.

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

- Contact your suppliers and explain that you require materials with NPEOs <100 ppm (0.01%).[2]
  - This includes fibres, yarns and fabrics, since NPEOs are widely used in spinning lubricants, sizing, pretreatment, dyeing, printing, finishing and coating. NPEOs are also widely used in industrial laundry detergents.
  - Pay special attention to suppliers of wool, wool blends and leather, since NPEOs are widely used for scouring and as a dispersing agent for dyeing.
  - Suppliers who use NPEOs in production for other clients may have contaminated machinery that can introduce NPEOs into their manufactured materials. Work with suppliers who have phased out the use of NPEOs for all clients.
  - Cleaning agents for equipment and maintenance may contain NPEOs that can contaminate materials. Cleaning agents should contain NPEOs <500 ppm (0.05%).

[1] Classification and risk phrases according to European Union Council Directive 67/548/EEC or Directive 1999/45/EC.
[2] Limit taken from AFIRM Restricted Substances Guidance (http://www.afirm-group.com/rsl-guidance/). This is the lowest agreed upon limit on NPEOs in products among AFIRM brands. 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 NPEO-compliant chemical formulations using the guidance in the next section.
- Have your suppliers confirm that their manufactured materials meet the NPEO <100 ppm limit with a certification or, if necessary, by providing a test report from a third-party laboratory.
- Perform risk-based checks of your suppliers' materials by submitting samples to a third-party laboratory for testing to ensure the NPEOs <100 ppm limit is not exceeded.

Guidance: Sourcing NPEO-Compliant Chemical Formulations from Your Chemical Suppliers

- Contact your chemical suppliers and explain that you require chemical formulations with no intentionally added NPEOs. Concentrations of NPEOs in chemical formulations used for wet processing should be <500 ppm (0.05%).[3]
  - Pay special attention to textile and leather[4] auxiliary suppliers who supply chemicals for dyeing, printing, finishing, laundering, scouring and coating formulations.
  - NPEOs are often used as a dispersing agent in solvent-free, synthetic-leather manufacturing.
  - NPEOs may also be found in many fibre/yarn/fabric spinning lubricants and sizes.
- Check the Material Safety Data Sheets (MSDS) of all chemical formulations to ensure that none of the NPEO CAS Numbers above is listed as an ingredient.
- Have your chemical suppliers confirm that their chemical formulations meet the NPEO <500 ppm limit with a certification or, if necessary[5], 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 NPEO <500 ppm limit is not exceeded.
- Discuss with your chemical supplier whether the below safer alternatives are suitable substitutes for your production needs.

Safer NPEO Alternatives

The following substances have been identified as examples of safer alternatives by the U.S. Environmental Protection Agency Design for the Environment Program. They may be suitable for your production needs. Any chosen alternative must be ZDHC MRSL compliant.

68439-46-3	C9-11 alcohols, ethoxylated (6EO)
68131-39-5	C12-15 alcohols, ethoxylated (9EO)
64366-70-7	Oxirane, methyl-, polymer with oxirane, mono(2-ethylhexyl ether); Ecosurf EH-9
68515-73-1	Glucopyranose, oligomeric, decyl octyl glycosides
68411-30-3	Benzenesulfonic acid, C10-13-alkyl derivs., sodium salt
151-21-3	Sodium lauryl sulfate
9004-82-4	Polyoxy(1,2-ethanediyl), alpha-sulfo-omegadodecyloxy-, sodium salt
1338-41-6	Sorbitan monostearate

Additional information about these alternatives is available at the following link:
http://www.epa.gov/dfe/pubs/projects/npe/aa-for-NPEs-final-version5-3-12.pdf

[3] Limit taken from ZDHC Manufacturing Restricted Substances List (MRSL) (http://www.roadmaptozero.com/df.php?file=pdf/MRSL.pdf) and is the limit on unintended NPEOs 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.

For additional information, contact a ZDHC brand member.