

## ALKYLPHENOL ETHOXYLATES (APEOs)

<b>Other Names</b>	Nonylphenol Ethoxylates (NPEOs; NPEs): Polyethylene glycol nonylphenyl ether Octylphenol Ethoxylates (OPEOs; OPEs): Polyethylene glycol octylphenyl ether
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CAS Number	Substance
9002-93-1	Polyethylene glycol 4-(tert-octylphenyl) ether
9036-19-5	Polyethylene glycol mono(octyl)phenyl ether
68987-90-6	Poly (oxy-1,2-ethanediyl), alpha-(octylphenyl)-omega-hydroxy-, branched

*List continued in "Additional Information"*

<b>May Be Found In</b>	<ul style="list-style-type: none"><li>Industrial laundry detergent</li><li>Scouring agents (e.g., wool and leather)</li><li>Wetting agents</li><li>Softeners</li><li>Spinning oils (yarn and fabric)</li><li>Emulsifier/dispersing agents for dyes and prints</li><li>Impregnating agents</li><li>Degreasing agents for leather hides</li><li>Leather-finishing preparations</li><li>De-gumming agents for silk production</li><li>Dyes and pigment preparations</li><li>Polyester padding</li><li>Down/feather fillings</li><li>Binders for interlinings</li><li>Facility cleaning products</li></ul>
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### Why Alkylphenol Ethoxylates (APEOs) are Restricted<sup>1</sup>

- Legislation around the world restricts the presence of APEOs in finished products.
- Leading apparel and footwear brands have restricted or banned the use of APEOs in production of their products.
- APEOs can degrade into alkylphenols (APs) in the environment.
- Some APs are very toxic to aquatic life with long lasting effects.
- Some APs are suspected of damaging human fertility and unborn children.
- See the [Alkylphenols Chemical Information Sheet](#) for more information on this class of chemicals.



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### Sourcing Compliant Materials from Your Suppliers

- Contact your suppliers and explain that you require their manufactured materials to be compliant with the current AFIRM RSL limits.<sup>2</sup>
- Require suppliers to submit a confirmation of material compliance or a test report from a third-party laboratory.
- When materials are received, consider performing risk-based testing to ensure the current AFIRM RSL limits are met.
- Materials of concern could include fibers, yarns and fabric since APEOs have been widely used in spinning lubricants, sizing, pretreatment, dyeing, printing, finishing and coating. APEOs have also been widely used in industrial laundry detergents.
- Pay special attention to suppliers of wool, wool blends and leather, since APEOs have been widely used for scouring and as a dispersing agent for dyeing.
- Suppliers who use APEOs in production for other clients may have contaminated machinery that can introduce APEOs into their manufactured materials. Work with suppliers who have phased out the use of APEOs for all clients.
- Cleaning agents for equipment and maintenance may contain APEOs that can contaminate materials. Cleaning agents should not contain intentionally-added APEOs.
- Share this information sheet with your material suppliers so they have full visibility and understand your sourcing requirements. Instruct them to work with their chemical suppliers to source APEO-compliant chemical formulations using the guidance in the next section.

### Sourcing Compliant Formulations from Your Chemical Suppliers

- For all formulations, request Safety Data Sheets (SDS) documentation that meets current GHS requirements.
- Contact your suppliers and explain that you require formulations used for wet processing to be compliant with the current ZDHC MRSL limits whenever applicable.<sup>3</sup> Have your chemical suppliers confirm this with a certificate or, if necessary, 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 ZDHC MRSL limits are not exceeded whenever applicable.
- Select textile finishing agents, dyeing chemicals, adhesives, printing inks and other formulations with no intentionally added APEOs.
- Pay special attention to textile and leather auxiliary suppliers who supply chemicals for dyeing, printing, finishing, laundering, scouring and coating formulations.
- APEOs are often used as a dispersing agent in solvent-free, synthetic-leather manufacturing.
- APEOs may also be found in many fiber/yarn/fabric spinning lubricants and sizes.
- Check the SDS of all chemical formulations to ensure that none of the APEO CAS Numbers listed in this Document are included as ingredients.
- Discuss with your chemical supplier whether any safer alternatives are available that are suitable substitutes for your production needs.
- 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).

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### Safer Alternatives

The following substances have been identified as examples of safer alternatives by the U.S. Environmental Protection Agency Design for the Environment Program (DfE).<sup>4</sup> They may be suitable for your production needs. Any chosen alternative must be compliant with the limits stated above as well as any brand specific limits.

CAS Number	Substance
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

- US EPA Design for the Environment Alternatives Assessment for Nonylphenol Ethoxylates  
[https://www.epa.gov/sites/production/files/2014-06/documents/npe\\_final.pdf](https://www.epa.gov/sites/production/files/2014-06/documents/npe_final.pdf)
- 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>.

There are many potential CAS numbers which comprise the APEO class of chemistries. Some of the more common ones are listed in this document, but the list is not inclusive of all the APEOs.

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

CAS Number	Substance
9002-93-1	Polyethylene glycol 4-(tert-octylphenyl) ether
9036-19-5	Polyethylene glycol mono(octyl)phenyl ether
68987-90-6	Poly (oxy-1,2-ethanediyl), alpha-(octylphenyl)-omega-hydroxy-, branched
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

### References

<sup>1</sup> Hazard information per harmonized classification and labelling approved by the European Union. Source: European Chemicals Agency, <http://echa.europa.eu/>

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



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<sup>3</sup> ZDHC Manufacturing Restricted Substances List (ZDHC MRSList). <http://www.roadmaptozero.com/programme/manufacturing-restricted-substances-list-mrslist-conformity-guidance/>

<sup>4</sup> U.S. Environmental Protection Agency Design for the Environment Program (DfE). (May 2012). DfE Alternatives Assessment for Nonylphenol Ethoxylates. [https://www.epa.gov/sites/production/files/2014-06/documents/npe\\_final.pdf](https://www.epa.gov/sites/production/files/2014-06/documents/npe_final.pdf)