

NONYLPHENOL (NP)

Class or Substance Name

Nonylphenol (NP)

Substance List by CAS Number

NP is a family of substances with identical molecular formulas and mass, but different chemical structures (isomers). Commonly used NPs include:

104-40-5	P-nonylphenol
11066-49-2	Isononylphenol
25154-52-3	Phenol (2,6-dimethylheptan-4-yl)
84852-15-3	Phenol, 4-nonyl-, branched

Description of Use in Apparel and Footwear

NP is an intermediate in the manufacture of many substances, including the widely used surfactant class of nonylphenol ethoxylates (NPEOs) and several antioxidants used to protect or stabilize polymers such as rubber and polyvinyl chloride (PVC). Biodegradation of NPEOs into NP is the main source of NP in the environment, but it can also be formed during polymer manufacturing from thermal decomposition of intentionally added NP-based antioxidants.

Legislation around the world restricts NP. Pending legislation in the European Union aims to restrict it in textile products. Leading apparel and footwear brands have set strict limits on NP in their products.

Why is NP Restricted?¹

- NP is very toxic to aquatic organisms and may cause long-term adverse effects in the aquatic environment.
- Above certain exposure levels, NP may impair human fertility and cause harm to unborn children.

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

- Contact your suppliers and explain that you require materials with NP <10 ppm (0.001%).²
 - Pay special attention to suppliers of plastic/rubber footwear materials and plastic/rubber components for apparel and accessories like bags and belts.
- Share this information sheet with your material suppliers and instruct them to work with their chemical suppliers to source NP-compliant chemical formulations using the guidance in the next section.
- Advise your material suppliers to adjust the time and temperature used to process their plastic/rubber materials to minimize thermal decomposition of NP-based stabilizers into NP.

NP MAY BE FOUND IN:

- Outsole materials of shoes
- Jelly sandals
- Plastic and rubber components of apparel, footwear and accessories

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 NP in products among AFIRM brands. Check with brands for their individual limits.

- Have your suppliers confirm that their manufactured materials meet the NP <10 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 NP <10 ppm limit is not exceeded.

Guidance: Sourcing NP-Compliant Formulations from Your Chemical Suppliers

- Contact your chemical suppliers and explain that you require chemical formulations with no intentionally added NP. Concentrations of NP in all formulations used to process materials should be <250 ppm (0.025%).³
- Pay special attention to suppliers of polymer starting materials and polymer additives like stabilizers used in footwear and plastic/rubber component production.
 - Poor qualities of the polymer antioxidant and PVC stabilizer tris(4-nonyl-phenyl) phosphite (TNPP), CAS 26523-78-4, may contain very high residual concentrations of NP and should be rejected.
- Check the Material Safety Data Sheets (MSDS) of all chemical formulations to ensure that none of the NP CAS Numbers above is listed as an ingredient.
- Have your chemical suppliers confirm that their chemical formulations meet the NP <250 ppm limit with a certification or, if necessary⁴, 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 NP <250 ppm limit is not exceeded.
- Discuss with your chemical supplier whether the below safer alternatives are suitable substitutes for your production needs.

Safer NP Alternatives

- Calcium/zinc stabilizers containing no NP-based antioxidants are available on the market. Contact your chemical suppliers for more information. These stabilizers may be suitable for your production needs. Any chosen alternative must be ZDHC MRSL compliant.

³ Limit taken from ZDHC MRSL (<http://www.roadmaptozero.com/df.php?file=pdf/MRSL.pdf>). This is the limit on unintended NP in chemical formulations accepted by ZDHC member brands.

⁴ At a later date, ZDHC will publish guidance on when testing of chemical formulations is appropriate.