

Stick with the safe choice.

Eastman non-phthalate plasticisers
for adhesives, sealants, and caulks





Flexible solutions for strong brands.

Creating much-needed elasticity, plasticisers improve the performance of adhesives, sealants, and caulks—optimizing viscosity, low-temperature efficacy, set-time functionality, impact resistance, and even tack. Changing regulations and consumer preferences, however, now demand that manufacturers use more non-phthalate plasticisers in the marketplace.

Eastman Chemical Company is poised to meet that demand.

For more than 50 years, Eastman has produced innovative plasticisers that are used in a variety of applications. Our versatile line of plasticisers includes many non-phthalate solutions to address the market's emerging regulatory needs and perceptions. Today, we're the global leader in non-phthalate plasticisers with the broadest product line in the industry.

Which Eastman non-phthalate plasticiser is right for you?

| End-use recommendations for European Markets | | Benzoflex 50 | Benzoflex 2088 | Benzoflex LA-705 | Benzoflex 9-88 | Benzoflex 9-88 SG | Benzoflex 352 | Benzoflex PS-507 | Benzoflex 1046 | Eastman 168 | Eastman DBT | Eastman TXIB | Eastman Triacetin |
|--|--|--------------|----------------|------------------|----------------|-------------------|---------------|------------------|----------------|-------------|-------------|--------------|-------------------|
| Adhesives | Cyanoacrylate adhesives | | | | ● | | | | | | ● | | |
| | Polyurethane adhesives | | | | | ● | | | | | | ○ | |
| | Hot melt adhesives | | | | | | ● | | | | | | |
| | Latex construction adhesives | ● | ○ | | | | | | | | ● | ○ | |
| | Latex packaging adhesives—polyvinyl acetate | | ● | ○ | | | | | | | ○ | ○ | ● |
| | Latex packaging adhesives—vinyl acetate/ethylene copolymer | | ● | ○ | | | | | | | | ○ | ○ |
| | Latex packaging adhesives—vinyl acetate/acrylic copolymer | | ● | | | | | | | | ● | ○ | ○ |
| | Latex pressure sensitive adhesives (PSA) | | ● | | | | | | | ● | | | ○ |
| Sealants | Polyurethane sealants | | | | ○ | ● | | | | | | | |
| | Latex sealants | ● | ○ | | | | | | | ● | ○ | ○ | |
| | PVC plastisol sealants | | ● | | | | | | ● | ● | | ● | |
| | Polysulfide sealants | | ○ | | ● | | | ● | | | | | |

● Recommended ○ Suitable in some formulations

For technical data, sales specifications, and MSDS, visit www.EastmanPlasticizers.com.

Eastman non-phthalate plasticisers for adhesives, sealants, and caulks

Benzoflex™ 50 plasticiser

Benzoflex 50 demonstrates exceptional performance in polyvinyl acetate water-based adhesives. A versatile monomeric plasticiser, it is compatible with polyvinyl acetate (PVAc) homopolymer and copolymer emulsions. It is suitable for most adhesive systems, providing improved wet tack, set times, and open times. It is also an efficient plasticiser in acrylic latex caulk formulations and has excellent solvating characteristics in flexible polyvinyl chloride (PVC) plastisol and dry blend formulations.

Benzoflex™ 2088 plasticiser

Benzoflex 2088 is a high-solvating plasticiser primarily known for its exceptional performance in polyvinyl acetate and water-based adhesive systems. In adhesives, it displays excellent wet tack, set times, and open times and also improves adhesion in acrylic latex caulks. It may also be used when formulating pressure sensitive acrylics. Benzoflex 2088 is also used in the A side of 2K polysulfide sealants.

In PVC, it serves as a fast fuser, delivering low processing temperatures and low volatility, which makes it a good plasticiser for interior applications, such as flooring.

Benzoflex™ LA-705 plasticiser

Benzoflex LA-705 offers a global solution for waterborne adhesives, including those based on polyvinyl acetate homopolymers and copolymers. It allows manufacturers of waterborne adhesives to maintain the same excellent levels of performance as Benzoflex 50 while reducing formulation cost.

Benzoflex™ 9-88 plasticiser

A high-solvating plasticiser used in a wide variety of applications—including resilient flooring, adhesives, artificial leather cloth, and caulk—Benzoflex 9-88 can be recommended in such polymer systems as cyanoacrylate adhesives, polyurethane dispersions, polysulfide sealants, and polyurethane sealants.

Benzoflex™ 9-88 SG plasticiser

Benzoflex 9-88 SG is very compatible and efficient for 2K polyurethane systems—recommended for cast urethane applications that require minimum cure interference and maximum compatibility. This excellent compatibility in cast polyurethane systems allows its use at high levels to achieve durometer readings ranging as low as 20–25 Shore A hardness for graphic art painting rolls.

Adaptable to both metering and hand batch urethane mix systems, Benzoflex 9-88 SG offers excellent inert filler acceptance and contributes improved tear strength, better rebound, and reduced swell with certain solvents.

Benzoflex™ 352 plasticiser

Benzoflex 352 is a white flake solid with a melt point of 118°C, which can offer significant performance advantages in a variety of hot melt adhesive applications. It also modifies melt flow characteristics with improved resistance to yellowing in powder coatings.

Benzoflex™ PS-507 plasticiser

Designed for use in 1K and 2K polysulfide sealants, Benzoflex PS-507 is an efficient plasticiser that decreases viscosity and improves flow, leveling, and workability. It is a cost-efficient solution in the A side of a 2K sealant.

Benzoflex™ 1046 plasticiser

Used in PVC plastisols, including PVC plastisol sealants, Benzoflex 1046 offers excellent rheological properties and high resin solvation at elevated temperatures. It imparts excellent stain resistance and has a high tolerance for fillers. Its low hydroxyl number, moisture content, acid value, and color make it an excellent choice for many PVC plastisol sealant applications.

The right choice for today's market

Eastman non-phthalate plasticisers comply with European market regulations, such as the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH).¹ For details, visit www.Eastman.com/reach.

Eastman 168™ non-phthalate plasticiser

Eastman 168 is an excellent non-phthalate plasticiser for acrylic latex sealants and adhesives with performance comparable to the general-purpose *ortho*-phthalate plasticisers. It offers good performance properties, low-temperature flexibility, and excellent nonmigration properties. When compared to *ortho*-phthalate plasticisers in acrylic sealants such as diisononyl phthalate (DINP), Eastman 168 is an ideal choice for a non-phthalate replacement.

Eastman 168 is used at low addition levels in some speciality pressure sensitive adhesives where listing in the Plastics Regulations is required.

In plastisols, Eastman 168 results in low initial viscosity and excellent maintained viscosity. It also offers a label-free choice for formulators, with a comprehensive toxicological profile available.

Eastman™ DBT plasticiser

Eastman DBT is a high-solvating non-phthalate plasticiser for waterborne adhesives that lowers a system's glass transition temperature (T_g) and provides comparable viscosity response to currently used plasticisers such as diisobutyl phthalate (DIBP). It demonstrates very low water solubility and is readily biodegradable.

Eastman DBT offers a label-free choice for formulators.

Eastman TXIB™ formulation additive

Eastman TXIB is the lowest viscosity (9 cps) additive in our product line.

In water-based adhesives, Eastman TXIB often yields a slightly higher viscosity response than many general-purpose plasticisers; yields lower T_g for better low-temperature properties; demonstrates reliability of supply with no labelling requirements; and offers cost savings to polyvinyl acetate (PVAc) and vinyl acetate ethylene (VAE) adhesive formulators.

Eastman™ Triacetin plasticiser

Eastman Triacetin demonstrates excellent T_g suppression in vinyl acetate homo- and copolymer emulsions, is readily biodegradable, offers a reliable supply with no adverse labelling required, and shows good compatibility with natural and synthetic rubber.

Eastman Triacetin is made to the appropriate current good manufacturing practices (cGMP) for use as a plasticiser in vinyl acetate based food-packaging adhesives.



About Eastman Chemical Company

Eastman was among the first to develop non-phthalate alternative plasticisers for making PVC flexible. In fact, Eastman 168™ non-phthalate plasticiser has been safely used for more than 30 years, with proven performance in a wide variety of applications. Benzoflex™ non-phthalate high-solvating plasticisers from Eastman have a 25-year track record of successful and safe use in adhesives, caulks, and sealants.

As a global solutions provider in the plasticiser industry, we offer a wide range of non-phthalate products and we remain committed to the long-term needs of our plasticiser customers. With multiple manufacturing locations around the world, Eastman is poised to meet the demands of the global marketplace, providing unmatched reliability of supply and helping our customers understand the shifting regulatory landscape affecting their business.



Eastman locations



| | | | | | | |
|---------------------|---------------------|--------------------------|-----------------------------|-----------------------------|-----------------|-----------------|
| Anniston, AL | Dietenheim, Germany | Jefferson, PA | Longview, TX | Nienburg, Germany | Suzhou, China | Wuhan, China |
| Antwerp, Belgium | Dresden, Germany | Jurong Island, Singapore | Madison, WI | Santo Toribio, Mexico | Taipei, Taiwan | Zhejiang, China |
| Canoga Park, CA | Franklin, VA | Kashima, Japan | Martinsville, VA | Sao Jose dos Campos, Brazil | Texas City, TX | Zibo, China |
| Chestertown, MD | Ghent, Belgium | ★ Kingsport, TN | Middelburg, The Netherlands | São Paulo Mauá, Brazil | Trenton, MI | |
| Chicago, IL | Hsinchu, Taiwan | Kohtla-Järve, Estonia | Monongahela, PA | Sauget, IL | Ulsan, Korea | |
| Chocolate Bayou, TX | Indianapolis, IN | Kuantan, Malaysia | Nanjing, China | Sete, France | Uruapan, Mexico | |
| Columbia, SC | Itupeva, Brazil | Lemoyné, AL | Newport, Wales | Springfield, MA | Workington, UK | |



To find out more about the Eastman advantage and our complete line of non-phthalate plasticiser solutions, visit us at www.EastmanPlasticizers.com.



The results of insight™

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Material Safety Data Sheets providing safety precautions that should be observed when handling and storing Eastman products are available online or by request. You should obtain and review the available material safety information before handling any of these products. If any materials mentioned are not Eastman products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be observed.

Neither Eastman Chemical Company nor its marketing affiliates shall be responsible for the use of this information or of any product, method, or apparatus mentioned, and you must make your own determination of its suitability and completeness for your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. NO WARRANTY IS MADE OF THE MERCHANTABILITY OR FITNESS OF ANY PRODUCT, AND NOTHING HEREIN WAIVES ANY OF THE SELLER'S CONDITIONS OF SALE.

*¹Benzoflex products, * Eastman DBT, Eastman TXIB, and Eastman Triacetin are not known to contain any substances listed on the candidate list of Substances of Very High Concern (SVHC) in concentrations greater than or equal to 0.1% or those otherwise established under paragraph 6(b) of Article 56 in Regulation (EC) No. 1907/2006 on the Registration, Evaluation, Authorisation, and Restriction of Chemicals (REACH).*

Eastman 168 is approved by European Food Safety Authority (EFSA) for food contact application, under Ref. No. 92200 for terephthalic acid, bis(2-ethylhexyl)ester with a specific migration limit of 60 mg/kg food. Regarding the dual-use additives provision, there are no additives subject to restrictions on concentrations in food as a food additive. This product is intended for use in the manufacture of materials and articles in compliance with the general requirements of Regulation (EC) 1935/2004. With reference to the SVHC Candidate List as amended up to and including the 19 December 2011 update, bis(2-ethyl(hexyl)phthalate (EINECS No. 204-211-0) is listed as a SVHC. Our analysis, however, demonstrates that the concentration of this substance is below the 0.1% (w/w) threshold concentration.

Eastman DBT may lawfully be used according to Food Contact Notification 744 as a plasticizer in polymers for use: (1) in adhesives that comply with 21 CFR 175.105, (2) in pressure sensitive adhesives that comply with 21 CFR 175.125, and (3) as a coating or component of paper or paperboard intended for use in contact with dry foods with no free surface fat or oil in compliance with 21 CFR 176.180. The use of this substance is subject to the limitations stated in the food contact notification as well as the general provisions for indirect food additives in 21 CFR 174.5.

Eastman TXIB complies with European Commission Regulations (EU) No. 10/2011 under PM/REF No. 95020.

Eastman Triacetin is approved by the European Food Safety Authority (EFSA) for food contact applications.

For further information, refer to our website: www.eastman.com/reach.

**As of publication, Benzoflex PS-502 has not been included in any regulatory testing.*

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