Eastman plasticizers **handling guidelines**

This publication contains general information on the handling requirements for Eastman plasticizers. Eastman assumes no liability or responsibility for any use or misuse, or the results of such use or misuse, of any information, procedure, conclusion, opinion, product, or process provided in this publication. Users of this information must be guided by the specific requirements of their company, personnel, technology, and manufacturing operations. All persons involved in using, handling, storing, transporting, and disposing of Eastman products have an independent obligation to ensure that their actions are in compliance with current federal, state, and local laws and regulations and should consult their technical and regulatory experts concerning such matters.

For specific health and safety information, users of Eastman products should thoroughly review the pertinent Safety Data Sheets (SDS).

Steel is the recommended material for the reliable storage of Eastman monomeric and polymeric plasticizers. For additional information on transporting, loading, and unloading plasticizers, see publication L-276 regarding storage guidelines for Eastman plasticizers.

Handling Eastman monomeric plasticizers

Several monomeric plasticizers, including Eastman DOP, Eastman 168™ non-phthalate plasticizer, Eastman TOTM, and many Benzoflex™ plasticizers, may require heating systems to facilitate the transfer from storage tanks or tank trucks during cold weather. Eastman 425 plasticizer and Eastman Effusion™ plasticizer require heated storage tanks, heat-traced transfer lines, and pumps to avoid freezing during cold weather. Eastman Effusion can begin to crystallize and freeze at or below 16°C (61°F).

At temperatures below 21°C (70°F), Benzoflex plasticizers will thicken, making pumping difficult. Because they are a mixture of materials, Benzoflex plasticizers do not have a simple freezing point. Benzoflex 2-45, Benzoflex 2088, Benzoflex LA-705, Benzoflex 50, Benzoflex 354, Benzoflex 284, Benzoflex RF-532, Benzoflex VP-953, Benzoflex PS-507, and Benzoflex LC-531 have the highest potential to form solids during cold weather. Typical storage and pumping temperatures for these plasticizers are shown in Table 1. A storage temperature of 25°C (77°F) or higher should be maintained to prevent these materials from forming solids.

In colder climates, it is recommended that storage tanks be insulated. Moreover, pumps and transfer piping should also be insulated and heat traced with self-regulating low-temperature heating cable. Insulating storage tanks will also aid in conserving energy. When sizing transfer lines and pumps, the higher resistance to flow of these plasticizers should be taken into account. If moisture content of the ester is critical, the tank should be vented to the atmosphere through a desiccant dryer. An overpressure/vacuum relief device should be provided for the tank.

In the event a plasticizer partially or completely solidifies or forms crystals, the storage tank, transfer lines, or pump containing the material should be heated gradually to prevent discoloration and/or degradation of the plasticizer. The temperature should be raised a few degrees at a time to 5°–11°C (10°–20°F) above the minimum storage temperature, and the plasticizer should be allowed to mix for 24 hours to ensure all solids and/or crystals have melted.

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Table 1. Handling temperatures of Eastman monomeric plasticizers

Plasticizer	Viscosity* (cP) @ 25°C (77°F)	Typical storage temp, °C (°F)	Typical pumping temp, °C (°F)
Eastman 168™	66	21–27 (70–80)	30 (86)
Eastman 168 SG	66	21–27 (70–80)	30 (86)
Eastman 168 Renew 20	66	21–27 (70–80)	30 (86)
Eastman 425	56	27–38 (80–100)	30 (86)
Eastman Effusion™	18	25–35 (77–95)	30–35 (86–95)
Eastman DOA	12	21–27 (70–80)	21–27 (70–80)
Eastman DOA Renew 20	12	21–27 (70–80)	21–27 (70–80)
Eastman DOM	15	21–27 (70–80)	21–27 (70–80)
Eastman DOP	60	21–27 (70–80)	30 (86)
Eastman TEG-EH	14	21–27 (70–80)	21–27 (70–80)
Eastman TOTM	218	21–27 (70–80)	49 (120)
Eastman Triacetin	18	21–27 (70–80)	21–27 (70–80)
Eastman Triacetin Renew 59	18	21–27 (70–80)	21–27 (70–80)
Eastman TXIB™ formulation additive	5	21–27 (70–80)	21–27 (70–80)
Eastman VersaBond™	70	30 (86)	43 (110)
Eastman VersaMax™ Plus	38	21-27 (70-80)	30 (86)
Benzoflex™ 1046	51	ambient	49 (120)
Benzoflex 131	8	ambient	27 (80)
Benzoflex 181	6	ambient	27 (80)
Benzoflex 2088	73	30 (86)	43 (110)
Benzoflex 2-45	77	30 (86)	49 (120)
Benzoflex 284	82	21–27 (70–80)	49 (120)
Benzoflex 352	solid	solid	solid
Benzoflex 354	718	ambient	49 (120)
Benzoflex 50	88	25 (77)	49 (120)
Benzoflex 9-88	112	20 (68)	49 (120)
Benzoflex 9-88 SG	112	20 (68)	49 (120)
Benzoflex LA-705	75	25 (77)	49 (120)
Benzoflex LC-531	60	25 (77)	49 (120)
Benzoflex PS-507	75	30 (86)	49 (120)
Benzoflex RF-532	70	35 (95)	49 (120)
Benzoflex TPU-405	112	20 (68)	49 (120)
Benzoflex VP-953	70	30 (86)	49 (120)
Eastman Versafix™	33	21–27 (70–80)	30 (86)

**Tested with AR2000 Rheometer/shear rate = 10 $(sec)^{-1}$ (typical ranges)*

If you have questions concerning the handling of Eastman plasticizers, contact your Eastman representative.

Handling Eastman polymeric plasticizers

Admex™ polymeric plasticizers require heated storage tanks to avoid freezing and to facilitate product transfer during cold weather. The typical storage temperature for Admex plasticizers is 60°–65°C (140°–149°F); typical pumping temperature is 90°–95°C (194°–203°F) for all Eastman plasticizers except Admex 525 which, because of its lower viscosity, has a typical pumping temperature of 75°C (167°F). For handling hot liquids, users should use appropriate personal protective equipment (PPE) and follow applicable safe handling procedures. When sizing transfer lines and pumps, the higher resistance to flow of these plasticizers should be taken into account. (See Table 2.)

Table 2. Viscosities of Eastman polymeric plasticizers

Plasticizer	Viscosity* (cP) @ 25°C (77°F)	Viscosity* (cP) @ 95°C (203°F)
Admex 334F	3000–4200	185
Admex 523	5500–6500	70
Admex 525	325–425	50 @ 75°C
Admex 6187	4800–6400	250
Admex 6995	1200–1600	85
Admex 760	40,000–60,000	1800
Admex 770	4000–5500	170
Admex P-27	4200–5500	195

**Tested with AR2000 Rheometer/shear rate = 10 $(sec)^{-1}$ (Typical ranges)*

Safety precautions

Safety information

An SDS providing toxicity information, physical and chemical data, and spill and emergency response information has been provided for each Eastman plasticizer. The user should review the SDS before handling, storing, or using any Eastman plasticizer. Copies are available at eastman.com or through your Eastman representative.

The information in this publication, along with the SDS, needs to be reviewed and understood to help ensure the safe handling of Eastman plasticizers. It is the customer's responsibility to direct and control unloading of any chemicals or materials into or from bulk storage and handling facilities.

Personal protective equipment

Personal protective equipment such as gloves, goggles, face shields, boots, and aprons—appropriate for the chemical being handled—should be specified, readily available, and worn by persons involved in the handling operation. Materials stored or handled at temperatures above 50°C (122°F) may present a thermal burn hazard and require appropriate protective wear. It is recommended that customers evaluate their handling and use procedures and select PPE appropriate to their needs. Consult the SDS for recommended practices and hazards.

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