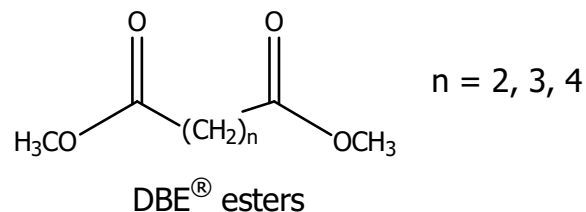


FlexiSolv® DBE® esters

Product Description

FlexiSolv® DBE® esters are refined dimethyl esters of adipic, glutaric, and succinic acids. The primary product is designated FlexiSolv® DBE® esters. FlexiSolv® DBE® esters are further distilled to produce four FlexiSolv® DBE® esters fractions for specialty applications: DBE®-LVP esters, DBE®-3 esters, DBE®-4 ester, and DBE®-5 ester.¹ FlexiSolv® DBE® esters are clear, colorless liquids having a mild, fruity odor. They are readily soluble in alcohols, ketones, ethers, and many hydrocarbons, but are only slightly soluble in water and paraffinic hydrocarbons. FlexiSolv® DBE® esters have greater than 55% recycled content.



Applications

- Solvents
- Industrial coatings
- Coil/sheet coatings
- Waterborne coatings
- Magnet wire coatings
- Automotive coatings
- Industrial cleaners
- Resin cleanup
- Paint removers
- Foundry core binders
- Printing inks
- Textile lubricants
- Magnetic memory disc coatings
- Urethane reaction solvents
- Peroxide solvents
- Chemical grouting/soil stabilization
- Solvent welding of polymers

¹ DBE®-LVP ester is identical to the product formerly known as DBE®-2 ester.

Plasticizers

- Fugitive
- Permanent diester and polyesters

Polymer Intermediates

- Polyester polyols for urethanes
- Wet-strength paper resins
- Polyester resins

Specialty Chemical Intermediates

- Quinacridone pigments

Storage and Handling

FlexiSolv® DBE® esters are readily available from INVISTA in large quantities (millions lb/yr) for growth applications.

An approximate shelf life of FlexiSolv® DBE® esters is 2 years, if the product is stored in the original container, kept tightly closed and dry, in a well ventilated location. Because storage and local ambient conditions vary and INVISTA has no control over the practices, procedures and conditions at your or other locations, the shelf life estimate provided here should be used as guidance only. It is not provided as a guarantee of any shelf life. It is recommended product be stored in a non-translucent (opaque) container.

Packages

Tank Trucks	45,000 lb net wt.
Tank Car	170,000 lb net wt.
Drums	522 lb gross wt. 485 lb net wt.

Technical Information

FlexiSolv® DBE® Esters General Information

Typical Compositions, wt %	FlexiSolv® DBE® esters	FlexiSolv® DBE®-LVP esters	FlexiSolv® DBE®-3 esters	FlexiSolv® DBE®-4 ester	FlexiSolv® DBE®-5 ester
Dimethyl Adipate	18	25	89	—	0.1
Dimethyl Glutarate	60	75	11	0.1	99.5
Dimethyl Succinate	22	0.1	<0.1	99.0	0.4
Methanol	<0.1	<0.1	<0.1	<0.1	<0.1
Water	0.03	0.03	0.03	0.02	0.03
Physical Properties					
Molecular Weight	159 ^a	163 ^a	173 ^a	146	160
Sp. Gr. at 20/20°C ^b	1.092 ^c	1.081 ^c	1.068 ^c	1.121	1.091
Density at 20°C (lb/gal)	9.09 ^c	9.00 ^c	8.89 ^c	9.33	9.08
Distillation Range, °C	196-225	210-225	215-225	196	210-215
Vapor Pressure at 20°C (Torr)	0.06 ^d	0.04 ^d	0.02 ^d	0.13	0.05
Solubility in Water, wt% at 20°C	5.3	4.2	2.5	7.5	4.3
Water Solubility in DBE's, wt% at 20°C	3.1	2.9	2.5	3.8	3.2
Freezing Point, °C	-20 ^c	-13 ^c	8	19	-37
Flash Point, Tag Closed Cup, °C (°F)	100 (212)	104 (219)	102 (216)	94 (200)	107 (225)
Auto Ignition Temp., °C	370	375	360	365	365
Latent Heat of Vaporization, cal/g	81	80	79	85	81
Viscosity at 25°C, cst.	2.4	2.5	2.5	2.5	2.5
Solvent Properties					
Solubility Parameters ^e					
Nonpolar	8.3	8.3	8.3	8.3	8.3
Polar	2.3	2.2	2.1	2.5	2.3
Hydrogen Bonding	4.8	4.7	4.5	5.0	4.8
Surface Tension at 20°C, dyn/cm	35.6	N/A	N/A	N/A	N/A
Electrical Resistance ^f at 24°C, megohms	0.5	N/A	N/A	N/A	N/A
Specifications					
Ester Content, wt% min.	99.0	99.0	99.0	98.5	99.5
Water Content, wt% max.	0.1	0.1	0.1	0.04	0.1
Methanol, wt% max.	0.2	0.1	0.1	0.1	0.1
Acid Number, max.	0.30	1.00	1.00	0.50	0.50
Composition Range					
Dimethyl Adipate	10-25	20-28	85-95	0.1 (max.)	0.2 (max.)
Dimethyl Glutarate	55-65	72-78	5-15	0.4 (max.)	98.5 (min.)
Dimethyl Succinate	15-25	1.0 (max.)	1.0 (max.)	98.0 (min.)	1.0 (max.)
Color, APHA, max.	15	15	15	15	15
Turbidity, ppm, max.	5	5	5	5	5

^a Average for mixture

^b sp. gr./T = -0.0007 per °C over the range 20-50 °C

^c Approximate, based on composition

^d Calculated for typical composition (excluding methanol, water, and other impurities) using Antoine constants determined according to ASTM E-1719.

^e Hansen Solubility Theory

^f Ransberg Paint Resistance Tester Model 219CB



For Samples and Information:
INVISTA™ Specialty Intermediates • (800) 231-0998
Email: NISP@INVISTA.com • www.FlexiSolv.com

This Product Data Sheet contains selected information about a specific INVISTA product, or group of products, and particular uses of the same. It relates only to the identified product and any identified uses, and is based on information available as of the date hereof. Additional information may be needed to evaluate other uses of the product, including use of the product in combination with any materials or in any processes other than those specifically referenced. Information provided herein with respect to any hazards that may be associated with the product is not meant to suggest that use of the product in a given application will necessarily result in any exposure or risk to workers or the general public. **THIS PRODUCT DATA SHEET DOES NOT CONTAIN A COMPLETE STATEMENT OF, AND DOES NOT CONSTITUTE A REPRESENTATION, WARRANTY OR GUARANTY WITH REGARD TO, A PRODUCT'S CHARACTERISTICS, USES, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR THE SUITABILITY, SAFETY, EFFICACY, HAZARDS OR HEALTH EFFECTS OF THE PRODUCT, WHETHER USED SINGULARLY OR IN COMBINATION WITH ANY OTHER PRODUCT, EXCEPT TO THE EXTENT REQUIRED BY THE RELEVANT LAW AND REGULATIONS.** Purchasers and users of the product are responsible for determining that the product is suitable for the intended use and that their workers and the general public are advised of any risks resulting from such use. Nothing contained in this Product Data Sheet shall be construed to modify any of the commercial terms pursuant to which the product was sold by INVISTA including, but not limited to, terms and conditions addressing each party's respective rights and obligations with regard to warranties, remedies and indemnification.

If purchasers and users believe or have reason to believe that the Product Data Sheet or other information provided to them by INVISTA is inaccurate or in any way insufficient for any purpose, they should immediately notify INVISTA of the same, and of the basis for their belief (for example, studies, data, reports of incidents, etc.) so that INVISTA can determine whether modification or supplementation of the Product Data Sheet, or other measures, are appropriate. Failure of purchasers and users to timely provide such notice shall be deemed a waiver by purchasers and users of any and all claims, demands or causes of action, including causes of action based on an alleged failure to warn, for personal injury or damage to the environment or property arising from or attributable to the use of product.

This disclaimer shall be effective to the extent allowed by law. Should any provision be deemed to be ineffective or unenforceable, that provision shall be deemed severed from the disclaimer and the remaining provisions shall continue to have full force and effect.

INVISTA, FlexiSolv®, and DBE® are trademarks of INVISTA. Copyright© 2016 INVISTA. All rights reserved.