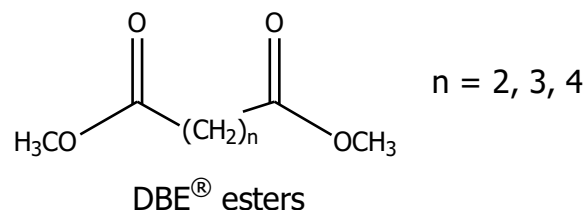


## DBE™ esters

### Product Description

DBE™ esters are refined dimethyl esters of adipic, glutaric, and succinic acids. The primary product is designated DBE™ esters. DBE™ esters are further distilled to produce four DBE™ esters fractions for specialty applications: DBE™-LVP esters, DBE™-3 esters, DBE™-4 ester, and DBE™-5 ester.<sup>1</sup> 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. 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

### 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

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

An approximate shelf life of 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.

<sup>1</sup> DBE™-LVP ester is identical to the product formerly known as DBE™-2 ester.

# Technical Information

## DBE™ Esters General Information

Typical Compositions, wt %	DBE™ esters	DBE™-LVP esters	DBE™-3 esters	DBE™-4 ester	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
<b>Physical Properties</b>					
Molecular Weight	159 <sup>a</sup>	163 <sup>a</sup>	173 <sup>a</sup>	146	160
Sp. Gr. at 20/20°C <sup>b</sup>	1.092 <sup>c</sup>	1.081 <sup>c</sup>	1.068 <sup>c</sup>	1.121	1.091
Density at 20°C (lb/gal)	9.09 <sup>c</sup>	9.00 <sup>c</sup>	8.89 <sup>c</sup>	9.33	9.08
Distillation Range, °C	196-225	210-225	215-225	196	210-215
Vapor Pressure at 20°C (Torr)	0.06 <sup>d</sup>	0.04 <sup>d</sup>	0.02 <sup>d</sup>	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 <sup>c</sup>	-13 <sup>c</sup>	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
<b>Solvent Properties</b>					
Solubility Parameters <sup>e</sup>					
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 <sup>f</sup> at 24°C, megohms	0.5	N/A	N/A	N/A	N/A
<b>Specifications</b>					
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

<sup>a</sup> Average for mixture

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

<sup>c</sup> Approximate, based on composition

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

<sup>e</sup> Hansen Solubility Theory

<sup>f</sup> Ransberg Paint Resistance Tester Model 219CB

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**For Samples and Information:**  
[www.DBE.INVISTA.com](http://www.DBE.INVISTA.com)

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