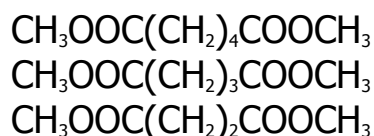


FlexiSolv™ DBE® Esters

Product Description

FlexiSolv™ 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 six DBE® esters for specialty applications: DBE®-2, DBE®-3, DBE®-4, DBE®-5, DBE®-6, DBE®-9, and DBE®-WS esters. 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 higher paraffins.



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

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 (million lb/yr) for growth applications.

Shipping Name—Dibasic ester mixture

Freight Classification—Resin solvents, NOIBN

DOT Classification—Based upon the characteristics of DBE® esters and its fractions, INVISTA has not classified DBE® esters or its fractions as hazardous materials or dangerous goods by global transportation regulations.

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.

Packages

Tank Trucks	45,000 lb net wt.
Tank Car	170,000 lb net wt.
Drums	523 lb gross wt. 485 lb net wt.

DBE[®] esters
General Information

Typical Compositions, wt%	DBE [®] esters	DBE [®] -2 esters	DBE [®] -3 esters	DBE [®] -4 ester	DBE [®] -5 ester	DBE [®] -6 ester	DBE [®] -9 esters	DBE [®] -WS esters
Dimethyl Adipate	21	24	89	—	0.1	98.7	0.2	20
Dimethyl Glutarate	59	75	10	0.3	99	<0.5	66	65
Dimethyl Succinate	20	0.3	0.2	98.4	0.4	<0.1	33	13
Methanol	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Water	0.05	0.02	0.04	0.02	0.03	0.03	0.04	0.1
Physical Properties								
Molecular Weight	159 ^a	163 ^a	173 ^a	146	160	174	156 ^a	160
Sp. Gr. at 20/20 °C ^b	1.092 ^c	1.081 ^c	1.068 ^c	1.121	1.091	1.064	1.099 ^c	1.09
Density at 20 °C (lb/gal)	9.09 ^c	9.00 ^c	8.89 ^c	9.33	9.08	8.86	9.15 ^c	9.09
Distillation Range, °C	196–225	210–225	215–225	196	210–215	227–230	196–215	196-230
Vapor Pressure at 20 °C (Torr)	0.2 ^d	0.04 ^d	0.02 ^d	0.13	0.05	0.01	0.07 ^d	0.2 ^d
Solubility in Water, wt% at 20 °C	5.3	4.2	2.5	7.5	4.3	2.4	~5	~5
Water Solubility in DBE [®] esters, wt% at 20 °C	3.1	2.9	2.5	3.8	3.2	2.4	~3.5	~3
Freezing Point, °C	-20 ^c	-13 ^c	8	19	-37	10	-10 ^c	-20
Flash Point, Tag Closed Cup, °C (°F)	100 (212)	104 (219)	102 (216)	94 (200)	107 (225)	113 (235)	94 (202)	103 (217)
Auto Ignition Temp., °C	370	375	360	365	365	360	365	370
Latent Heat of Vaporization, cal/g	81	80	79	85	81	79	82	81
Viscosity at 25 °C, cst.	2.4	2.5	2.5	2.5	2.5	2.5	2.4	2.4
Solvent Properties								
Solubility Parameters ^e								
Nonpolar	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
Polar	2.3	2.2	2.1	2.5	2.3	2.1	2.3	2.3
Hydrogen Bonding	4.8	4.7	4.5	5.0	4.8	4.5	4.8	4.8
Surface Tension at 20 °C, dyn/cm	35.6	N/A	N/A	N/A	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	N/A	N/A	N/A
Specifications								
Ester Content, wt% min.	99.0	99.0	99.0	98.5	99.0	99.0	99.0	99.0
Water Content, wt% max.	0.10	0.10	0.10	0.04	0.10	0.05	0.10	0.10
Methanol, wt% max.	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2
Acid Number, max.	0.30	1.00	1.00	0.50	0.50	1.00	0.50	0.30
Composition Range								
Dimethyl Adipate	10–25	20–28	85–95	0.1 (max.)	0.2 (max.)	98.5 (min.)	0.3 (max.)	10-30
Dimethyl Glutarate	55–65	72–78	5–15	0.4 (max.)	98.0 (min.)	1.0 (max.)	65–69	55-75
Dimethyl Succinate	15–25	1.0 (max.)	1.0 (max.)	98.0 (min.)	1.0 (max.)	0.15 (max.)	31–35	10-35
Color, APHA, max.	15	15	15	15	15	15	15	15
Turbidity, ppm, max.	5	5	5	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 using Antoine constants determined according to ASTM D-1719.

^e Hansen Solubility Theory

^f Ransberg Paint Resistance Tester Model 219CB

For Samples and Information:
INVISTA Specialty Materials • (800) 231-0998 • Web address: www.FlexiSolv.com

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