HUNTSMAN

Enriching lives through innovation

Essential Building Blocks

for Coatings, Adhesives & Sealants and Composites Applications

Product Families

Huntsman Corporation is a leading global producer of intermediate chemistries and technologies that add value to customers worldwide. Our customers benefit from world-scale manufacturing capacity backed with highly skilled regional customer support, in-depth technical expertise and dedicated market knowledge. The Huntsman Performance Products product lines include ethylene amines, cycloaliphatic amines, morpholine derivatives, polyetheramines, specialty amines like alkylalkanol amines and substituted propylamines, as well as various carbonates.

AMINES

JEFFAMINE® Polyetheramines

JEFFAMINE® polyetheramines typically impart increased flexibility and toughness, and are low viscosity and low color products. Historically, the core JEFFAMINE® polyetheramine family consisted of monoamines, diamines and triamines based on the core polyether backbone structure. More recently, the addition of hindered, high-conversion, polytetramethylene glycol (PTMEG)-based, and secondary polyetheramines has increased the utility of these products.

Ethyleneamines

Huntsman offers a complete line of ethylene amines. We manufacture our ethyleneamines via the ethylene dichloride/ammonia process. Ethyleneamines are widely used as hardeners in epoxy systems that are cured under ambient conditions, and are used to produce thermoplastic polyamide resins for hot-melt adhesives.

Cycloaliphatic Amine

JEFFAMINE® RFD-270 amine is a polyetheramine with a cycloaliphatic segment combining the advantages of both product families. Color stable, low blush tendency, low viscosity and good flexibility combined with enhanced glass transition temperature, hardness and modulus.

Morpholine and Derivatives

Morpholine and derivatives may be used as an accelerator/catalyst in epoxy formulations or as catalyst/initiator in UV curable acrylic-based systems for coatings and adhesives.

Specialty Amines

Alkylalkanol amines such as N-methyldiethanolamine (MDEA), and substituted propylamines such as aminopropylmorpholine (APM), dimethylaminopropylamine (DMAPA) are typically used as epoxy accelerators or curing agents, and as intermediates for coatings.

CARBONATES

JEFFSOL® Carbonates

Huntsman's carbonates provide a more environmentally friendly alternative to products such as methylene chloride, acetone and aromatic solvents. Our carbonates are typically used as cure accelerator in silicate (water-glass) binding and in phenol formaldehyde resins. As solvent and (reactive) diluent in epoxy formulations and urethane systems, in industrial cleaners and paint removers, and in polyester synthesis.

AMINES

POLYETHERAMINES

	TYPICAL PROPERTIES						APPLICATION			FUNCTION					
	Approximate Molecular Weight, g/mol	Typical Total Amine Content, meq/g	Amine Hydrogen Equivalent Weight (AHEW), g/eq	Density, g/ml @ 25°C	Viscosity, cSt @ 25°C	Flash Point, PMCC, °C	Coatings	Adhesives & Sealants	Composites	EP - Epoxy Curing Agent	PM - Polymer & Resin Modifier	IM - Intermediate	S - Solvent / RD - Reactive Diluent	AC - Accelerator / Catalyst	pH - PH Control
JEFFAMINE® D-series															
JEFFAMINE® D-230 amine Polyoxypropylene diamine	230	8.1-8.7	60	0.948	9.5	121	■	■	■	EP	PM		RD		
JEFFAMINE® D-400 amine Polyoxypropylene diamine	430	4.1-4.7	115	0.972	22	163	■	■	■	EP	PM		RD		
JEFFAMINE® D-2000 amine Polyoxypropylene diamine	2000	0.98-1.05	514	0.991	250	185	■	■		EP	PM				
JEFFAMINE® D-4000 amine Polyetheramine	4000	0.44-0.52	1000	0.994	877	227	■	■		EP	PM				
JEFFAMINE® D-205 amine Slow reactivity aliphatic polyether diamine	219	8.6 min.	58	0.943	7	121			■	EP					
JEFFAMINE® T-series															
JEFFAMINE® T-403 amine Polyoxypropylene triamine	440	6.1-6.6	81	0.978	75	196	■	■	■	EP	PM		RD		
JEFFAMINE® T-3000 amine Polyoxypropylene triamine	3000	0.90-0.98	530	0.996	370	235	■	■	■	EP	PM				
JEFFAMINE® T-5000 amine Polyoxypropylene triamine	5000	0.50-0.54	952	0.997	820	213	■	■	■	EP	PM				
JEFFAMINE® EDR-series															
JEFFAMINE® EDR-148 amine Higher reactivity polyether diamine	148	12.7 min.	37	0.998	8	129	■	■	■	EP	PM	IM	RD		
JEFFAMINE® THF-series															
JEFFAMINE® THF-100 amine PTMEG/PPG copolymer based diamine	1000	1.87-2.06	260	0.976	120 @ 40°C	238	■	■		EP	PM				
JEFFAMINE® THF-170 amine Higher reactivity PTMEG based triamine	1700	1.4-1.7	380	0.965 @ 38°C	940 @ 38°C	>232	■	■		EP	PM				
JEFFAMINE® M-series															
JEFFAMINE® M-600 amine Polyoxypropylene monoamine	600	1.58-1.79	291	0.979	30	129	■	■			PM				pH
JEFFAMINE® M-1000 amine Polyoxypropylene monoamine	1000	0.94 min.	489	1.07 @ 38°C	Waxy solid	98	■	■			PM				pH
JEFFAMINE® M-2005 amine Polyoxypropylene monoamine	2000	0.42-0.50	1045	1.00	130 @ 38°C	235	■	■			PM				pH
JEFFAMINE® M-2070 amine Polyoxypropylene monoamine	2000	0.45 min.	1040	1.07	185 @ 38°C	243	■	■			PM				pH
JEFFAMINE® ED-series															
JEFFAMINE® ED-600 amine PEG/PPG copolymer based diamine	600	3.00-3.43	132	1.04	70 @ 20°C	160	■	■			PM				
JEFFAMINE® ED-900 amine PEG/PPG copolymer based diamine	900	1.80-2.25	250	1.06 @ 38°C	120	174	■	■			PM				
JEFFAMINE® ED-2003 amine PEG/PPG copolymer based diamine	2000	0.90-1.05	575	1.07 @ 50°C	135 @ 50°C	260	■	■			PM				

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ETHYLENEAMINES															
EDA Ethylenediamine	60	33	~15	0.90 @ 20°C	2 cP @ 20°C	43	■	■	■	EP	PM	IM			
DETA Diethylenetriamine	103	29	~21	0.95 @ 20°C	7 cP @ 20°C	102	■	■	■	EP	PM	IM			
TETA Triethylenetetramine	151	26	~24	0.98 @ 20°C	14 cP @ 20°C	118	■	■	■	EP	PM	IM			
TEPA Tetraethylenepentamine	200	24	~27	0.99 @ 20°C	23 cP @ 20°C	>177	■	■	■	EP	PM	IM			
ECA-29 Polyamine mixture	271	22	~36-38	1.01 @ 20°C	225 cP @ 25°C	>182	■	■	■	EP	PM	IM			
AEP Aminoethylpiperazine	129	23	43	0.99 @ 20°C	10 cP @ 20°C	100	■	■	■	EP	PM	IM		AC	
CYCLOALIPHATIC AMINE															
JEFFAMINE® RFD-270 amine Includes a polyetheramine segment	270	7.3-8.0	67.0	0.96	68	>149			■	EP					
MORPHOLINE															
MOR Morpholine	87	na	na	1.00	2 cP @ 20°C	35	■	■			PM	IM		AC	
NMM N-methylmorpholine	101	na	na	0.92	1	13	■	■					AC		
NEM N-ethylmorpholine	115	na	na	0.91	1	30	■	■					AC		
SPECIALTY AMINES															
Accelerator															
Accelerator 400 Epoxy curing promoter	na	na	145	1.089	810	90	■	■	■					AC	
Alkylalkanol Amines															
DMEA Dimethylethanolamine	89	na	na	0.890	3 @ 20°C	41	■				PM			AC	pH
MDEA N-methyldiethanolamine	119	na	na	1.04	37 @ 38°C	140	■				PM			AC	pH
MMEA Monomethylethanolamine	75	na	na	0.900	14 @ 20°C	71	■				PM			AC	pH
JEFFADD® series															
JEFFADD® HEEU additive N-(2-Hydroxyethyl)ethylene urea	116	na	na	Solid	84 @ 60°C	>221	■				PM	IM			

AMINES	TYPICAL PROPERTIES						APPLICATION			FUNCTION					
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SUBSTITUTED PROPYLAMINES															
APM Aminopropylmorpholine	144	na	na	0.990	6 @ 20°C	100	■	■	■			IM	RD	AC	pH
DMAPA Dimethylaminopropylamine	102	na	51	0.820	1 @ 20°C	29	■	■	■			IM	RD	AC	
DMDPTA N, N-dimethyldipropylenetriamine	159	na	53	0.870	10-20	>100	■	■	■	EP	PM				
APMMEA N-aminopropylmonomethylethanolamine	132	15	na	0.969	47	128	■	■			PM			AC	pH
APMMEA-WB N-aminopropylmonomethylethanolamine*	na	12	na	1.01	74	>100	■	■						AC	pH
APDEA N-aminopropyldiethanolamine	162	12	na	1.10	245 @ 38°C	196	■	■			PM	IM		AC	
MOPA Methoxypropylamine	89	na	na	0.870	0.8 @ 38°C	27	■	■				IM		AC	pH

* In water

CARBONATES	TYPICAL PROPERTIES						VOC		APPLICATION			FUNCTION			
	Approximate Molecular Weight, g/mol	Density, g/ml @ 25°C	Viscosity, cSt @ 25°C	Flash Point, PMCC, °C	Boiling point, 760mm Hg, °C	Vapor pressure, kPa @ 20°C	EU Directive 1999 / 13 / EC based on vapour pressure	EU Directive 2004 / 42 / EC based on boiling point	Coatings	Adhesives & Sealants	Composites	PM - Polymer & Resin Modifier	IM - Intermediate	S - Solvent / RD - Reactive Diluent	C - Cleaner Solvent
CARBONATES															
JEFFSOL® EC carbonate Ethylene carbonate	88	1.32 @ 40°C	2 @ 40°C	160	248	<0.01	Zero VOC		■	■		PM	IM	S / RD	
JEFFSOL® PC carbonate Propylene carbonate	102	1.20	2.5	135	242	<0.01	Zero VOC		■	■		PM	IM	S / RD	C
JEFFSOL® GC carbonate Glycerine carbonate	118	1.38	85	>190	>250	<0.01	Zero VOC	Zero VOC	■	■		PM	IM	S / RD	
JEFFSOL® MCH methylcyclohexane Environmentally friendly aliphatic solvent	98	0.77	1	-4	101	4.8			■	■				S	C

About Huntsman

Huntsman Corporation is a publicly traded global manufacturer and marketer of differentiated and specialty chemicals with 2020 revenues of approximately $6 billion. Our chemical products number in the thousands and are sold worldwide to manufacturers serving a broad and diverse range of consumer and industrial end markets. We operate more than 70 manufacturing, R&D and operations facilities in approximately 30 countries and employ approximately 9,000 associates within our four distinct business divisions. For more information about Huntsman, please visit the company's website at www.huntsman.com.

Huntsman Performance Products

Performance Products brings together innovation and world-leading process technologies to produce components used to formulate products that enhance people's lives. Our leading global positions in the manufacture and sale of amines, maleic anhydride and carbonates enable us to serve diverse consumer and industrial end markets, including energy, automotive and transportation, coatings and adhesives, construction and infrastructure, electronics, and industrial manufacturing. With 10 manufacturing facilities in North America, Europe, the Middle East and Asia, we produce and sell over 350 products to over 900 global customers, and provide extensive pre- and post-sales technical service support. The division had 2020 revenues of USD 1 billion.

www.huntsman.com/pp

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