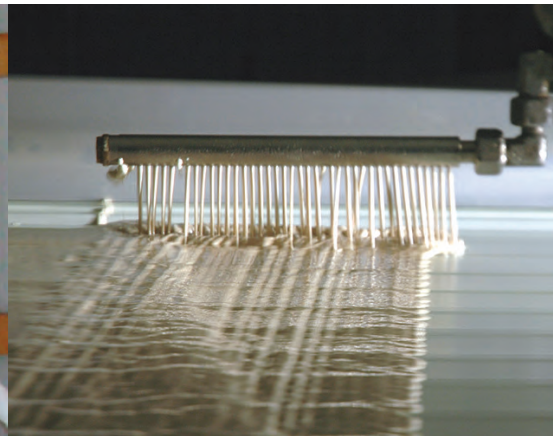
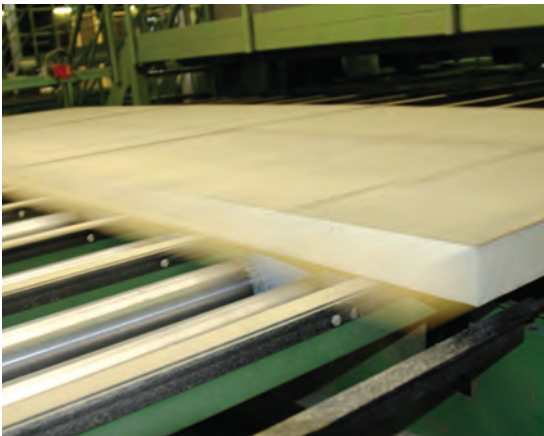


JEFFOL® AND TEROL® SPECIALTY POLYOLS

Improving Polyurethane Performance and Energy Efficiency



Huntsman, Delivering Solutions to the Polyurethanes Industry for Decades

Dedicated to the polyurethanes business for more than four decades, Huntsman is a worldwide leader in the production of polyether and aromatic polyester polyols and MDI-based technologies.

Our footprint in the Americas region spans from Canada all the way to Argentina, with 15 manufacturing, customer support, technical centers and systems houses serving the insulation, composite wood products, automotive, furniture/bedding, TPUs, appliances, adhesives, coatings, elastomers (ACE) and footwear markets.

With world-class MDI and polyol production facilities in North America, Europe and Asia, and systems houses spanning the entire globe, Huntsman is set to deliver a consistent and reliable supply of polyurethane technologies anywhere in the world.



JEFFOL® Polyol/Features	Reactive Aromatic Amine Polyol	Reactive Amine Polyol	Blowing Agent Solubility	Improved Pentane Solubility	High Water Content Compatible	Fire Performance Improvements	High Functionality	Catalyst Reduction	Blend Compatibility	Lower Viscosity	Flow, Reactivity, Properties for Panels	General Purpose for Rigid Foams
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AMINE POLYOLS

JEFFOL® A-630		X						X		X		
JEFFOL® A-800		X					X					
JEFFOL® AD-310	X		X							X		
JEFFOL® AD-393	X		X				X	X	X	X		
JEFFOL® AD-500	X								X			

MANNICH POLYOLS

JEFFOL® R-350X	X					X						
JEFFOL® R-425X	X			X								
JEFFOL® R-470X	X				X				X			
JEFFOL® R-650X	X						X					

SUCROSE/GLYCOL POLYOLS

JEFFOL® SD-311										X		X
JEFFOL® SD-361									X			X
JEFFOL® SD-441									X		X	X

SUCROSE/GLYCERINE POLYOLS

JEFFOL® SG-360												X
JEFFOL® SG-522						X	X					X

SUCROSE/AMINE POLYOLS

JEFFOL® SA-499		X						X				
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SORBITOL POLYOLS

JEFFOL® S-490							X					
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JEFFOL® Polyether Polyols

Huntsman produces a variety of JEFFOL® polyether polyols. These polyols are essential to the development of polyisocyanurate and polyurethane systems for energy-saving insulation, boardstock, insulated metal panel and appliance applications.

JEFFOL® Polyol/ Typical Properties	Hydroxyl Number	Viscosity (cP @ 25°C)	Specific Gravity (@ 25°C)	H ₂ O Content (max wt%)	Functionality (Average)
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AMINE POLYOLS

JEFFOL® A-630	635	430	1.07	0.1	3.0
JEFFOL® A-800	800	20,000	1.05	0.1	4.0
JEFFOL® AD-310	310	2,200	1.06	0.1	3.2
JEFFOL® AD-393	393	5,000	1.08	0.1	3.9
JEFFOL® AD-500	500	18,000	1.10	0.1	3.2

MANNICH POLYOLS

JEFFOL® R-350X	530	14,000	1.12	0.1	2.9
JEFFOL® R-425X	425	4,500	1.105	0.1	3.2
JEFFOL® R-470X	470	11,500	1.06	0.1	3.3
JEFFOL® R-650X	450	24,000	1.06	0.1	3.7

SUCROSE/GLYCOL POLYOLS

JEFFOL® SD-311	311	1,450	1.08	0.1	4.3
JEFFOL® SD-361	360	2,500	1.08	0.1	4.4
JEFFOL® SD-441	440	6,500	1.11	0.1	4.3

SUCROSE/GLYCERINE POLYOLS

JEFFOL® SG-360	360	3,500	1.10	0.1	4.7
JEFFOL® SG-522	520	30,000	1.17	0.1	5.0

SUCROSE/AMINE POLYOLS

JEFFOL® SA-499	495	6,500	1.11	0.3	4.3
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SORBITOL POLYOLS

JEFFOL® S-490	490	9,000	1.10	0.1	4.7
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General Purpose* JEFFOL® Polyol/Typical Properties	Hydroxyl Number	Viscosity (cP @ 25°C)	Specific Gravity (@ 25°C)	H ₂ O Content (max wt%)	Functionality (Average)
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GLYCERINE POLYOLS

JEFFOL® FX31-167	167	250	1.02	0.05	3.0
JEFFOL® FX31-240	240	250	1.03	0.05	3.0
JEFFOL® G30-650	650	900	1.09	0.10	3.0

POLYPROPYLENE GLYCOLS

JEFFOL® PPG-400	282	75	1.00	0.05	2.0
JEFFOL® PPG-1000	112	150	1.00	0.02	2.0
JEFFOL® PPG-2000	56	370	1.01	0.05	2.0

POLYPROPYLENE GLYCOLS/ETHYLENE OXIDE CO-POLYMERS

JEFFOL® FE11-37 3,000 mol. wt.	37	720	1.05	0.05	2.0
JEFFOL® PPG-2801 High Reactivity Diol	40	525	1.02	0.05	2.0
JEFFOL® PPG-3703 High Reactivity Diol	30	750	1.02	0.10	2.0
JEFFOL® PPG-3706 3,700 mol. wt.	30	780	1.02	0.10	2.0
JEFFOL® PPG-3709 3,700 mol. wt.	30	820	1.03	0.10	2.0

PROPYLENE OXIDE/ETHYLENE OXIDE CO-POLYMERS

JEFFOL® FC31-56 3,000 mol. wt. Triol	56	490	1.02	0.05	3.0
JEFFOL® G31-28 6,000 mol. wt. EO Tipped Triol	28	1,150	1.02	0.07	3.0
JEFFOL® G31-32 5,200 mol. wt. EO Tipped Triol	32	960	1.02	0.10	3.0
JEFFOL® G31-35 4,500 mol. wt. EO Tipped Triol	35	860	1.02	0.10	3.0
JEFFOL® G31-43 4,000 mol. wt. Triol	43	975	1.09	0.10	3.0
JEFFOL® G32-170 1,000 mol. wt. High EO Triol	170	130	1.13	0.50	3.0
JEFFOL® FE41-28 6,000 mol. wt. Triol	28	1,600	1.09	0.05	3.0
JEFFOL® FE41-42 4,000 mol. wt. Triol	42	975	1.10	0.07	3.0
JEFFOL® FE41-48 3,500 mol. wt. Triol	48	710	1.06	0.11	3.0
JEFFOL® FX81-28 6,000 mol. wt. EO/PO Triol	28	1,150	1.03	0.05	3.0

TMP

JEFFOL® TP-400 420 mol. wt. TMP-Based Triol	400	65	1.02	0.05	3.0
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* Can also be used in Rigid Polyol Systems

TEROL[®] Polyester Polyols

TEROL[®] polyester polyols are a line of more than 25 aromatic polyester polyols used in the manufacturing of polyurethane and polyisocyanurate foams. TEROL polyols provide unique performance and processing characteristics, including improved flammability characteristics in both polyurethane and polyisocyanurate applications, thus reducing the need for expensive flame retardants.

TEROL [®] Polyol/Features	Hydroxyl Number	Equivalent Weight	Viscosity @ 25°C (cPs)	Acid # (max)	H ₂ O Content (max)	SpG @ 25°C	Functionality	Aromatic content (%)	Pre-Consumer Recycle ¹ (%)	Post-Consumer Recycle ² (%)	Rapidly Renewable Content ³ (%)
TEROL [®] 11	410 - 460	129.0	500 - 1,500	2.0	0.10	1.230	2.00	29.8	6.14	15.82	0.00
TEROL [®] 198	175 - 195	303.2	3,200 - 4,200	2.5	0.10	1.234	2.00	33.0	6.81	17.56	0.00
TEROL [®] 250*	235 - 265	224.4	4,000 - 6,000	2.0	0.15	1.234	2.00	39.5	27.0	36.0	0.00
TEROL [®] 256	255 - 275	215.8	10,000 - 14,000	2.0	0.10	1.260	2.30	37.5	7.87	20.29	0.00
TEROL [®] 305	285 - 315	187.0	5,000 - 6,000	1.5	0.15	1.241	2.20	35.8	7.52	19.37	0.00
TEROL [®] 350	335 - 365	160.3	4,000 - 6,000	3.0	0.15	1.224	2.25	37.0	7.10	18.29	0.00
TEROL [®] 352	335 - 365	160.3	2,500 - 3,500	2.0	0.15	1.239	2.20	33.9	7.50	19.40	0.00
TEROL [®] 563*	235 - 255	233.8	2,500 - 4,000	2.0	0.15	1.242	2.00	37.2	32.0	0.00	0.00
TEROL [®] 595	150 - 170	350.6	1,600 - 2,600	2.0	0.10	1.164	2.00	27.8	5.74	14.79	20.50
TEROL [®] 649*	360 - 380	151.6	5,500 - 7,500	2.0	0.10	1.214	3.00	30.3	3.57	15.78	16.90
TEROL [®] 925	295 - 315	187.0	10,000 - 13,000	2.1	0.10	1.255	2.40	38.5	7.96	20.52	0.00
TEROL [®] 1154	190 - 210	280.5	4,000 - 6,000	2.0	0.15	1.201	2.20	35.8	22.76	0.00	18.40
TEROL [®] 1254	235 - 265	224.4	1,200 - 1,800	2.0	0.15	1.191	2.20	29.9	4.26	10.97	20.55
TEROL [®] 1304	105 - 125	487.8	2,500 - 4,500	2.0	0.10	1.148	2.00	30.7	3.74	9.65	27.20
TEROL [®] 1326	290 - 310	187.0	10,000 - 15,000	1.5	0.15	1.192	2.60	30.4	4.76	12.26	19.25
TEROL [®] 1364	235 - 265	224.4	600 - 1,000	2.0	0.15	1.179	2.00	26.0	2.69	6.93	15.00
TEROL [®] 1465	285 - 305	187.0	4,500 - 6,500	2.0	0.15	1.240	2.40	33.4	7.21	18.57	0.00
TEROL [®] 1481	290 - 310	187.0	5,250 - 7,250	2.0	0.15	1.185	2.60	29.9	4.82	12.41	30.01

¹ Pre-consumer Recycle Material - materials diverted from waste stream in a manufacturing process as defined by International Standard ISO 14021.

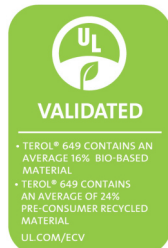
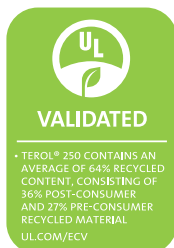
² Post-consumer Recycle Material - materials generated by households or by commercial industrial and institutional facilities in their role as end-users of the product which can no longer be used for its intended purpose as defined by International Standard ISO 14021.

³ Rapidly Renewable Materials - materials made from plants that are typically harvested with a ten year cycle or shorter as defined by LEED for New Construction & Major Renovations, Version 2.2.

* UL Environment Certified Recycle Content, see certification badge on back.

TEROL® Polyol/Features	High Functionality	Lower Viscosity	Improved Fire Performance	Low Hydroxyl Number	Low Equivalent Weight	Improved Pentane Solubility	High Water Content Compatible	Recommended for Boardstock Applications	General Purpose for Rigid Foams	Recommended for Panel Applications	Recommended for Closed Cell Spray Foam	Pre-Consumer Recycle Content	Post-Consumer Recycle Content	Rapidly Renewable Content
TEROL® 11		X			X		X					X	X	
TEROL® 198				X			X					X	X	
TEROL® 250*			X					X	X		X	X	X	
TEROL® 256	X		X						X	X	X	X	X	
TEROL® 305			X						X		X	X	X	
TEROL® 350			X	X	X							X	X	
TEROL® 352		X			X				X			X	X	
TEROL® 563*								X		X		X		
TEROL® 595				X			X		X			X	X	X
TEROL® 649*	X		X		X	X					X	X	X	X
TEROL® 925	X		X							X	X	X	X	
TEROL® 1154				X		X		X	X			X	X	X
TEROL® 1254		X					X		X			X	X	X
TEROL® 1304		X		X			X		X			X	X	X
TEROL® 1326	X	X				X	X		X	X		X	X	X
TEROL® 1364												X	X	X
TEROL® 1465	X	X	X				X			X	X	X	X	
TEROL® 1481	X	X				X						X	X	X

* TEROL® 250, 563 and 649 modified aromatic polyester polyols has received the Underwriters Laboratories (UL) Environment certification.



Huntsman utilizes both pre-consumer and post-consumer sources of recycled PET in their processes for producing the TEROL® product line. In both cases, the PET is collected, sorted, washed and size reduced for digestion in reactors using mixtures of glycols. PET from post-consumer sources is collected from curbside and municipal programs, in a recent year, the equivalent of over 450 million water bottles were used to manufacture TEROL aromatic polyester polyols.

Huntsman has recently retained UL Environment to certify our pre-consumer recycled, post-consumer recycled and renewable resource content claims. With TEROL polyols, the environmental benefits can be enjoyed without sacrificing performance.

Huntsman Polyurethanes' Americas Locations

MANUFACTURING SITES



Huntsman MDI and JEFFOL® Polyols Manufacturing Facility
GEISMAR, LOUISIANA

TEROL® Performance Polyols Manufacturing Facility
HOUSTON, TEXAS

Thermoplastic Polyurethanes (TPU) Manufacturing Facility
RINGWOOD, ILLINOIS

Huntsman Propylene Oxide Manufacturing Facility
PORT NECHES, TEXAS

Huntsman JEFFOL® Polyols Manufacturing Facility
CONROE, TEXAS

TECHNICAL CENTERS



Huntsman Advanced Technology Center (HATC)
THE WOODLANDS, TEXAS

Auburn Hills Technical Center
AUBURN HILLS, MICHIGAN

Thermoplastic Polyurethanes (TPU) Technical Center
DERRY, NEW HAMPSHIRE

São Paulo Advanced Technological Centre
SÃO PAULO, BRAZIL

SYSTEMS HOUSES



Huntsman MDI Manufacturing Facility
GEISMAR, LOUISIANA

Peel Site
MISSISSAUGA, ONTARIO, CANADA

Cartagena Facility
CARTAGENA, COLOMBIA

São Paulo Facility
SÃO PAULO, BRAZIL

CUSTOMER SUPPORT CENTERS



Huntsman Headquarters
THE WOODLANDS, TEXAS

Mexico City Support Center
MEXICO CITY, MEXICO

Buenos Aires Support Center
BUENOS AIRES, ARGENTINA



HUNTSMAN POLYURETHANES' AMERICAS FOOTPRINT

Huntsman Polyurethanes' Americas Locations



MANUFACTURING SITE



TECHNICAL CENTER



SYSTEMS HOUSE



CUSTOMER SUPPORT CENTER



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HUNTSMAN

Enriching lives through innovation

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Hazards, toxicity and behavior of the products may differ when used with other materials and are dependent on the manufacturing circumstances or other processes. Such hazards, toxicity and behavior should be determined by the user and made known to handlers, processors and end users.

Huntsman Polyurethanes is an international business unit of Huntsman International LLC. Huntsman Polyurethanes trades through Huntsman affiliated companies in different countries such as Huntsman International LLC in the USA and Huntsman Holland BV in Western Europe.

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Enriching lives through innovation

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