

# Stepan Alkoxylate Product Guide

Stepan Trade Name	Chemical Description	Average # of Moles EO	Molecular Weight	Appearance at 25°C	HLB	Activity, %	Density at 25°C, U.S. lbs/gal	Pour Point, °C	Cloud Point, °C	Surface Tension, dynes/cm % Deionized (DI) Water			Draves Wetting Test, seconds 0.1% in DI Water	Ross Miles Foam Test, cm 0.1% in DI Water	
										0.10%	0.01%	0.001%		Initial	5 minutes
<b>Linear Alcohol Ethoxylates</b>															
BIO-SOFT® N91-2.5	C9-11 Alcohol ethoxylate	2.5	281	Liquid	8.5	99.5 min.	7.71	-10	<0 <sup>1</sup>	25.7	26.3	45.0	7	1.0	1.5
BIO-SOFT® N91-6	C9-11 Alcohol ethoxylate	6	425	Liquid	12.4	99.5 min.	8.25	6	53 <sup>1</sup>	27.2	34.5	52.5	7	13.5	10.5
BIO-SOFT® N91-8	C9-11 Alcohol ethoxylate	8	524	Liquid	13.9	99.5 min.	8.40	14	81 <sup>1</sup>	29.6	40.9	53.9	10	13	11
BIO-SOFT® N1-3	C11 Alcohol ethoxylate	3	305	Liquid	8.7	99.5 min.	7.75	-7	<0 <sup>1</sup>	26.0	26.3	41.3	19	3.2	3.1
BIO-SOFT® N1-5	C11 Alcohol ethoxylate	5	392	Liquid	11.2	99.5 min.	8.08	7	18 <sup>1</sup>	27.1	27.0	44.0	5	10	7
BIO-SOFT® N1-7	C11 Alcohol ethoxylate	7	479	Liquid	12.9	99.5 min.	7.75	12	58 <sup>1</sup>	28.0	28.7	44.8	7	12	9.5
BIO-SOFT® N1-9	C11 Alcohol ethoxylate	9	569	Liquid	13.9	99.5 min.	8.08	20	78 <sup>1</sup>	30.6	32.2	47.3	12	12.5	10.5
BIO-SOFT® N23-3	C12-13 Alcohol ethoxylate	3	322	Liquid	8.1	99.5 min.	7.70	4	<0 <sup>1</sup>	26.0	26.3	28.4	66	1.7	1.7
BIO-SOFT® N23-5	C12-13 Alcohol ethoxylate	5	413	Liquid	10.7	99.5 min.	8.00	11	<25 <sup>1</sup>	27.6	27.8	33.8	19	4.7	4.6
BIO-SOFT® N23-6.5	C12-13 Alcohol ethoxylate	6.5	484	Liquid	11.9	99.5 min.	8.16	16.7	43 <sup>1</sup>	27.8	27.7	32.3	9	11	10
BIO-SOFT® N25-3	C12-15 Alcohol ethoxylate	3	330	Liquid	8	99.5 min.	7.71	8	<0 <sup>1</sup>	26.1	26.4	29.3	123	1.5	1.4
BIO-SOFT® N25-7	C12-15 Alcohol ethoxylate	7	524	Slurry	12.2	99.5 min.	8.00	20	49 <sup>1</sup>	28.6	28.5	34.1	16	10.5	9.5
BIO-SOFT® EN8-90	C12-15 Alcohol ethoxylate	7.8	560	Liquid	13.3	90 min.	8.33	10	62 <sup>1</sup>	29.2	29.7	33.9	19	9.6	9.5
BIO-SOFT® E-678	C12-15 Alcohol ethoxylate	9	597	Liquid	13.3	85 min.	8.05	10	74 <sup>1</sup>	30.3	30.4	36.6	17	10.5	9.5
BIO-SOFT® N25-9	C12-15 Alcohol ethoxylate	9	597	Paste	13.3	99.5 min.	8.00	25	74 <sup>1</sup>	30.3	30.4	36.6	17	10.5	9.5
BIO-SOFT® N25-12	C12-15 Alcohol ethoxylate	12	761	Paste	14.4	99.5 min.	8.43	26	78 <sup>2</sup>	34.5	34.7	35.6	58	10.7	9.9
BIO-SOFT® N45-7	C14-15 Alcohol ethoxylate	7	545	Liquid	11.6	100	8.07 @ 40°C	24	46 <sup>1</sup>	29.7	29.6	32.7	15	8.1	8.1
<b>Lauryl Alcohol Ethoxylates</b>															
BIO-SOFT® EC-600	C12-14 Alcohol ethoxylate	7	494	Liquid	12.2	99.5 min.	8.00	19	51 <sup>1</sup>	28.6	28.3	33.8	10	10.5	9.5
BIO-SOFT® EC-690	C12-14 Alcohol ethoxylate	7	494	Liquid	12.2	89.5 min.	8.23	5	51 <sup>1</sup>	28.7	28.1	34.9	14	11	9
BIO-SOFT® EC-639	C12-14 Alcohol ethoxylate	8	547	Liquid	13.3	90 min.	8.50	24	73 <sup>1</sup>	30.3	29.8	38.6	20	10.5	9
BIO-SOFT® AE-8	C12-14 Alcohol ethoxylate	8	555	Liquid	13	100	8.50	21	73 <sup>1</sup>	32.1	31.4	35.3	9	9.3	9.2
BIO-SOFT® AE-12	C12-14 Alcohol ethoxylate	12	727	Wax	14.7	100	8.70	65	97 <sup>3</sup>	35.0	34.3	38.4	36	9.9	9.5
BIO-SOFT® E-840	C12-14 Alcohol ethoxylate	23	1209	Wax	16.9	99	9.10	41	78 <sup>3</sup>	43.7	42.2	38.5	>300	10.8	8.8
BIO-SOFT® E-847	C12-14 Alcohol ethoxylate	23	1209	Liquid	16.9	74-76	7.10	17	77 <sup>3</sup>	40.2	35.4	38.4	75	9	7.6

<sup>1</sup> 1% in water

<sup>2</sup> 1% in 5% NaCl aqueous

<sup>3</sup> 1% in 10% NaCl aqueous

<sup>4</sup> 2% in 33% Ethylene glycol monobutyl ether aqueous

<sup>5</sup> 1% in 1% NaCl aqueous

<sup>6</sup> 10% in 25% Diethylene glycol butyl ether

<sup>7</sup> 2% in 10% NaCl aqueous

<sup>8</sup> 5% in water

<sup>9</sup> 10% in water

<sup>10</sup> 5g in 25g BDG1 25%

Stepan Trade Name	Chemical Description	Average # of Moles EO	Molecular Weight	Appearance at 25°C	HLB	Activity, %	Density at 25°C, U.S. lbs/gal	Pour Point, °C	Cloud Point, °C	Surface Tension, dynes/cm			Draves Wetting Test, seconds	Ross Miles Foam Test, cm	
										% Deionized (DI) Water				0.1% in DI Water	
										0.10%	0.01%	0.001%		Initial	5 minutes
<b>Branched Alcohol Ethoxylates</b>															
MAKON® DA-4	Decyl alcohol ethoxylate	4	324	Liquid	10	99 min.	8.00	-13	<25 <sup>1</sup>	26.3	41.6	56.7	2	2.1	0.2
MAKON® DA-6	Decyl alcohol ethoxylate	6	431	Liquid	12	99 min.	8.20	6	43 <sup>1</sup>	26.6	42.4	56.3	5	12.5	1.5
MAKON® DA-9	Decyl alcohol ethoxylate	9	563	Liquid	14	99 min.	8.40	1	80 <sup>1</sup>	28.7	44.9	49.7	19	11.5	4.5
MAKON® UD-5	Undecyl alcohol ethoxylate	5	394	Liquid	10.9	99.5 min.	8.12	4	63 <sup>10</sup>	26.8	33.8	50.4	3	5.5	3
MAKON® UD-6	Undecyl alcohol ethoxylate	6	438	Liquid	11.9	99.5 min.	8.22	9	69 <sup>10</sup>	26.8	34.3	49.3	3	8.4	5.2
MAKON® UD-7	Undecyl alcohol ethoxylate	7	482	Liquid	12.8	99.5 min.	8.33	12	74 <sup>10</sup>	26.9	37.4	53.0	3	10	5.6
MAKON® UD-8	Undecyl alcohol ethoxylate	8	525	Liquid	13.2	99.5 min.	8.39	12	77 <sup>10</sup>	27.2	39.0	52.8	4	10	8.9
MAKON® TD-3	Tridecyl alcohol ethoxylate	3	333	Liquid	8	100	7.76	<-12	<25 <sup>1</sup>	27.2	26.9	38.6	13	1	0.3
MAKON® TD-6	Tridecyl alcohol ethoxylate	6	474	Liquid	11	99 min.	8.10	7	<25 <sup>1</sup>	27	27	35.3	12	4	4
BIO-SOFT® TD-630	Tridecyl alcohol ethoxylate	8	562	Liquid	12.3	95	8.01	7	47 <sup>1</sup>	27.5	27.7	37.3	4	9.5	5
MAKON® TD-9	Tridecyl alcohol ethoxylate	9	570	Liquid	13.1	99.5 min.	8.40	14	57 <sup>1</sup>	27.7	28.5	39.9	12	4	4
MAKON® TD-12	Tridecyl alcohol ethoxylate	12	724	Paste	14	100	8.35	17	89 <sup>1</sup>	31.2	31.9	39.1	20	10.9	9.9
MAKON® TD-18	Tridecyl alcohol ethoxylate	18	936	Solid	16	100	8.35	21	>100 <sup>1</sup>	32.7	34.2	50.1	26	11.6	10.3
MAKON® TD-189	Tridecyl alcohol ethoxylate	18	936	Liquid	16	90	8.51	21	>100 <sup>1</sup>	34.0	36.3	31.9	18	11.5	9.9
MAKON® TD-30	Tridecyl alcohol ethoxylate	30	1496	Solid	17.4	99.5 min.	8.82 @ 50°C	41	>100 <sup>1</sup>	41.1	48.4	38.0	>300	11.8	10.8
<b>Amide Ethoxylates</b>															
NINOL® 1301	Amide ethoxylate	6	552	Solid	12.8	100	8.22	30	>100 <sup>1</sup>	30.3	30.7	32.2	50	1.8	1
NINOL® C-5	Amide ethoxylate	6	477	Liquid	14.6	100	8.30	12	87 <sup>1</sup>	31.6	32.3	33	24	10.3	9.9
NINOL® C-5 SPECIAL	Amide ethoxylate	6	477	Liquid	14.6	100	8.51	12	87 <sup>1</sup>	31.6	32.3	33	24	10.3	9.9
<b>Tallowamine Ethoxylates</b>															
BIO-SOFT® TA-2	Tallowamine ethoxylate	2	Proprietary	Liquid	5	100	7.40 (at 38 °C)	-10	<0 <sup>1</sup>	27.7	28.1	29.4	133	0.8	0.6
TOXIMUL® TA-5	Tallowamine ethoxylate	5	Proprietary	Liquid	9	100	7.90	15	32 <sup>1</sup>	31.7	31.7	37.4	22	5	4.7
TOXIMUL® TA-8	Tallowamine ethoxylate	8	Proprietary	Liquid	11	100	8.18	2	79 <sup>1</sup>	35.2	36.8	39.4	41	8.5	7.5
TOXIMUL® TA-10	Tallowamine ethoxylate	10	Proprietary	Liquid	11.7	99.5 min.	8.32	18	>100 <sup>1</sup>	37.1	38.7	39.2	70	9.1	8
TOXIMUL® TA-15	Tallowamine ethoxylate	15	Proprietary	Liquid	14	100	8.50	2	98 <sup>2</sup>	40.4	41.4	48.5	>300	9.5	0.5
TOXIMUL® TA-20	Tallowamine ethoxylate	20	Proprietary	Liquid	16.5	99.5 min.	8.71	10	>100 <sup>2</sup>	43.1	43.2	48.0	>300	7.7	2.3

<sup>1</sup> 1% in water      <sup>4</sup> 2% in 33% Ethylene glycol monobutyl ether aqueous      <sup>7</sup> 2% in 10% NaCl aqueous      <sup>10</sup> 5g in 25g BDG1 25%  
<sup>2</sup> 1% in 5% NaCl aqueous      <sup>5</sup> 1% in 1% NaCl aqueous      <sup>8</sup> 5% in water  
<sup>3</sup> 1% in 10% NaCl aqueous      <sup>6</sup> 10% in 25% Diethylene glycol butyl ether      <sup>9</sup> 10% in water

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										% Deionized (DI) Water				0.1% in DI Water	0.1% in DI Water
										0.10%	0.01%	0.001%	Initial		5 minutes
<b>Cocoamine Ethoxylates</b>															
TOXIMUL® CA-2	Cocoamine ethoxylate	2	294	Liquid	6	100	7.51	2	<0 <sup>1</sup>	27.8	27.8	45.3	44	1.8	1.6
TOXIMUL® CA-7.5	Cocoamine ethoxylate	7.5	529	Liquid	12	100	8.26	-18	99 <sup>1</sup>	35.0	34.9	49.6	90	10.7	7.9
<b>Tall Oil Fatty Acid Ethoxylates</b>															
NINEX® MT-603	Tall oil fatty acid ethoxylate	3	Proprietary	Liquid	6	100	8.40	<-1	40 <sup>6</sup>	32.4	33.3	35.5	>300	1.1	1.0
NINEX® MT-610	Tall oil fatty acid ethoxylate	10	Proprietary	Liquid	12	99.6 min.	8.70	21	22.5 <sup>5</sup>	37.0	38.6	52.3	>300	6.5	4
NINEX® MT-615	Tall oil fatty acid ethoxylate	15	Proprietary	Liquid	13	99.5 min.	8.80	13	53 <sup>5</sup>	38.3	39.7	43.5	>300	5.2	3.7
NINEX® MT-630F	Tall oil fatty acid ethoxylate	30	Proprietary	Solid	16	99.5 min.	8.90 (at 40°C)	22	78 <sup>5</sup>	41.9	43.2	47.2	>300	4.8	3.7
<b>Polyarylphenol Alkoxylates</b>															
MAKON® TSP-12	Tristyrylphenol ethoxylate	12	935	Liquid	12	99.5 min.	9.20	-8	27 <sup>1</sup>	41.1	41.6	43.6	104	4.9	3.1
MAKON® TSP-16	Tristyrylphenol ethoxylate	16	1049	Liquid	13	99.5 min.	9.30	19	62 <sup>1</sup>	42.1	42.1	36.8	43	4.5	0.6
MAKON® TSP-20	Tristyrylphenol ethoxylate	20	1282	Paste	14	99.5 min.	9.20	30	84 <sup>1</sup>	44.2	43.7	46.1	>300	7.2	2.9
MAKON® TSP-25	Tristyrylphenol ethoxylate	25	1496	Solid	15	99.5 min.	9.00	40	>94 <sup>1</sup>	46.1	46.0	40.0	>300	7.3	3.2
MAKON® TSP-25F	Tristyrylphenol alkoxylate	25	Proprietary	Liquid	14	100	9.24	8	55 <sup>3</sup>	44.9	45.1	48.3	>300	7.9	5.1
MAKON® TSP-40N	Tristyrylphenol ethoxylate	40	2117	Solid	16	99.5 min.	9.10	35	>100 <sup>1</sup>	49.7	71.6	50.5	>300	6	2.4
MAKON® TSP-40F	Tristyrylphenol alkoxylate	40	Proprietary	Liquid	15	100	9.20	19	58.5 <sup>3</sup>	47.3	47.8	50.2	>300	7.1	3.8
MAKON® TSP-54	Tristyrylphenol ethoxylate	54	2805	Solid	16	99.5 min.	9.10 (at 50°C)	37	>100 <sup>1</sup>	49.6	51.7	52.8	>300	7.7	4.7
MAKON® TSP-60	Tristyrylphenol ethoxylate	60	2877	Solid	18	99.5 min.	9.10	44	>100 <sup>1</sup>	50.3	52.0	52.1	>300	5.5	2.6
MAKON® TSP-60F	Tristyrylphenol alkoxylate	60	Proprietary	Paste	16	100	9.20	21	59 <sup>3</sup>	47.9	48.3	52.8	>300	5.9	3.9
STEP-FLOW® 1500	Tristyrylphenol polyalkylene oxide block copolymer	Proprietary	Proprietary	Liquid	17	100	9.20	4	61 <sup>1</sup>	43.2	43.5	45.5	250	7.8	3.9
<b>Nonylphenol Ethoxylates</b>															
MAKON® 4	Nonyl phenol ethoxylate	4	398	Liquid	9	99.8	8.68	-20	<10 <sup>1</sup>	27.2	27.3	32.6	226	0.9	0.2
MAKON® 6	Nonyl phenol ethoxylate	6	480	Liquid	11	99.8	8.68	-29	<25 <sup>1</sup>	29.9	29.8	35.5	19	1.2	0.7
MAKON® 8	Nonyl phenol ethoxylate	8	591	Liquid	12	99.8	8.68	6	24 <sup>1</sup>	30.6	30.7	38.7	5	6.5	5
MAKON® 10	Nonyl phenol ethoxylate	10	638	Liquid	13	99.8	8.85	4	54 <sup>1</sup>	31.6	31.5	39.7	8.4	7.9	6.8
MAKON® 12	Nonyl phenol ethoxylate	12	747	Liquid	14	99.8	8.85	14	81 <sup>1</sup>	34.1	33.4	44.6	28.9	10.1	8.9
MAKON® 14	Nonyl phenol ethoxylate	14	843	Liquid	15	99.8	8.93	19	>100 <sup>1</sup>	36.8	36.3	48.1	39	9.9	9.2
MAKON® 30	Nonyl phenol ethoxylate	30	1435	Solid	17	99.5	8.93	40	>100 <sup>1</sup>	42.5	43.0	45.4	>300	11	9.6
MAKON® 40	Nonyl phenol ethoxylate	40	2040	Solid	17.8	99.5	8.93	44	>100 <sup>1</sup>	43.9	47.3	54.3	>300	9.9	9.3

<sup>1</sup> 1% in water      <sup>4</sup> 2% in 33% Ethylene glycol monobutyl ether aqueous      <sup>7</sup> 2% in 10% NaCl aqueous      <sup>10</sup> 5g in 25g BDG1 25%  
<sup>2</sup> 1% in 5% NaCl aqueous      <sup>5</sup> 1% in 1% NaCl aqueous      <sup>8</sup> 5% in water  
<sup>3</sup> 1% in 10% NaCl aqueous      <sup>6</sup> 10% in 25% Diethylene glycol butyl ether      <sup>9</sup> 10% in water

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										0.10%	0.01%	0.001%		0.1% in DI Water	Initial
<b>Octyl Phenol Ethoxylates</b>															
MAKON® OP-3	Octyl phenol ethoxylate	3	326	Liquid	7.4	100	8.51	<-23	45 <sup>7</sup>	Insoluble	Insoluble	Insoluble	Insoluble	Insoluble	Insoluble
MAKON® OP-9	Octyl phenol ethoxylate	9	602	Liquid	13.2	100	8.93	7	65 <sup>1</sup>	31.8	32.9	46.8	6	9.5	8.3
MAKON® OP-30	Octyl phenol ethoxylate	30	1275	Wax	17.3	99.5 min.	9.40 (at 50°C)	31	>100 <sup>1</sup>	28.4	31.9	48.8	29	9.2	9.1
MAKON® OP-3070	Octyl phenol ethoxylate	30	1275	Liquid	17.3	70	9.00	-9	66 <sup>3</sup>	28.5	35.1	51.5	33	8.6	8.3
<b>Castor Oil Ethoxylates</b>															
TOXIMUL® 8243	Castor oil ethoxylate	20	Proprietary	Liquid	10	100	8.60	-12	<25 <sup>1</sup>	41.3	45.3	53.4	>300	3.5	1.3
STEPANTEX® CO-30	Castor oil ethoxylate	30	Proprietary	Liquid	12	100	8.80	6	62 <sup>2</sup>	42.4	48.1	53	>300	4.5	3
STEPANTEX® CO-36	Castor oil ethoxylate	36	Proprietary	Liquid	13	100	8.80	13	75 <sup>5</sup>	39.6	42.9	53.3	>300	4	3.5
STEPANTEX® CO-40	Castor oil ethoxylate	40	Proprietary	Liquid	13	100	8.90	16	85 <sup>1</sup>	39.5	40.8	51.8	>300	6	5
<b>Sorbitan Ester Ethoxylates</b>															
TOXIMUL® SEE-340	Sorbitan ester ethoxylate	20	Proprietary	Liquid	11	100	8.70	<-12	<25 <sup>1</sup>	38.0	46.5	57.5	>300	10	10
TOXIMUL® SEE-341	Sorbitan ester ethoxylate	20	Proprietary	Liquid	12	100	9.00	<-1	84 <sup>1</sup>	42.9	46.4	52.7	>300	4.6	4
<b>Alcohol Alkoxyates</b>															
MAKON® NF-12	Alcohol alkoxyate	Proprietary	Proprietary	Liquid	6	100	8.340	-10	15 <sup>1</sup>	32.7	33.8	36.6	9	0.25	0
MAKON® TD-50	Tridecyl alcohol alkoxyate	48	2478	Solid	16.4	99.5 min.	9.00	29	67 <sup>4</sup>	39.1	52.3	44.1	>300	8.7	5.7
TOXIMUL® 8315	Butyl block copolymer	Proprietary	3500	Liquid	13	100	8.80	3	71 <sup>1</sup>	42.3	44.3	49.4	>300	3.2	0.6
TOXIMUL® 8320	Butyl block copolymer	Proprietary	5500	Liquid	12	100	8.80	20	50 <sup>3</sup>	36.5	40.3	44.8	180	7.5	4.5
TOXIMUL® 8325	Butyl block copolymer	Proprietary	4000	Liquid	14	100	8.80	26	65 <sup>1</sup>	38.5	42.2	46.9	178	4.6	0.4
TOXIMUL® 8350	Butyl block copolymer	Proprietary	6200	Liquid	14	100	8.80	21	71 <sup>9</sup>	35.7	38.3	45.4	42	8.1	6.1
<b>Amide Alkoxyates</b>															
MAKON® NF-5	Alkoxyated isopropyl amide	Proprietary	Proprietary	Liquid	5	97	8.50	4	-1 <sup>1</sup>	32.5	40.4	45.7	55	1.3	0.3

<sup>1</sup> 1% in water

<sup>2</sup> 1% in 5% NaCl aqueous

<sup>3</sup> 1% in 10% NaCl aqueous

<sup>4</sup> 2% in 33% Ethylene glycol monobutyl ether aqueous

<sup>5</sup> 1% in 1% NaCl aqueous

<sup>6</sup> 10% in 25% Diethylene glycol butyl ether

<sup>7</sup> 2% in 10% NaCl aqueous

<sup>8</sup> 5% in water

<sup>9</sup> 10% in water

<sup>10</sup> 5g in 25g BDG1 25%



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										0.10%	0.01%	0.001%		Initial	5 minutes
<b>EO/PO Block Copolymer Liquids</b>															
<i>Note: MAKON® L-Series products contain &lt;100 ppm ash catalyst. Upon request, an unfiltered grade denoted as "U" is available, containing approximately 1500 ppm ash.</i>															
MAKON® L61	Polyalkylene oxide block copolymer	Proprietary	2000	Liquid	3	100	8.46	-32	24 <sup>1</sup>	Insoluble	43.7	46.9	Insoluble	Insoluble	Insoluble
MAKON® L62*	Polyalkylene oxide block copolymer	Proprietary	2500	Liquid	7	100	8.65	-41	32 <sup>1</sup>	42.3	44.6	48.6	>360	1.6	0.1
MAKON® L64	Polyalkylene oxide block copolymer	Proprietary	2900	Liquid	15	100	8.74	18	58 <sup>1</sup>	41.5	44.4	48.0	>360	1.3	0
MAKON® L101	Polyalkylene oxide block copolymer	Proprietary	3800	Liquid	1	100	8.48	-36	15 <sup>1</sup>	Insoluble	34.8	39.2	Insoluble	Insoluble	Insoluble
STEP-FLOW® 26F	Polyalkylene oxide block copolymer	Proprietary	5900	Liquid	13	100	8.35	7	82 <sup>1</sup>	35.5	38.4	40.9	38	8.7	7.9
<b>EO/PO Block Copolymer Pastes</b>															
MAKON® P65/75	Polyalkylene oxide block copolymer	Proprietary	3800	Paste	17	100	8.53 (at 60°C)	27	82 <sup>1</sup>	41.8	45.0	47.9	>360	4.4	1.4
MAKON® P104	Polyalkylene oxide block copolymer	Proprietary	5900	Paste	13	100	8.46 (at 60°C)	32	82 <sup>1</sup>	35.7	38.9	42.9	>360	9.2	9.0
MAKON® P105*	Polyalkylene oxide block copolymer	Proprietary	6500	Paste	15	100	8.60 (at 60°C)	36	63 <sup>3</sup>	35.7	38.5	42.9	>360	8.2	7.3
<b>Reverse EO/PO Block Copolymer Liquids</b>															
<i>Note: MAKON® R-Series products contain &lt;100 ppm ash catalyst.</i>															
MAKON® 17R2	Polyalkylene oxide block copolymer	Proprietary	2150	Liquid	6	100	8.59	-39	35 <sup>1</sup>	43.0	45.8	48.8	>360	0	0
MAKON® 17R4	Polyalkylene oxide block copolymer	Proprietary	2650	Liquid	12	100	8.73	10	46 <sup>8</sup>	45.2	48.1	51.1	69	0.2	0

\*Samples available upon request. For commercial status of this product, please contact your Stepan Sales Representative.

<sup>1</sup> 1% in water      <sup>4</sup> 2% in 33% Ethylene glycol monobutyl ether aqueous      <sup>7</sup> 2% in 10% NaCl aqueous      <sup>10</sup> 5g in 25g BDG1 25%  
<sup>2</sup> 1% in 5% NaCl aqueous      <sup>5</sup> 1% in 1% NaCl aqueous      <sup>8</sup> 5% in water  
<sup>3</sup> 1% in 10% NaCl aqueous      <sup>6</sup> 10% in 25% Diethylene glycol butyl ether      <sup>9</sup> 10% in water

Stepan Trade Name	Chemical Description	Average # of Moles EO	Molecular Weight	Appearance at 25°C	HLB	Activity, %	Density at 25°C, U.S. lbs/gal	Pour Point, °C	Cloud Point, °C	Surface Tension, dynes/cm			Draves Wetting Test, seconds	Ross Miles Foam Test, cm	
										% Deionized (DI) Water				0.1% in DI Water	
										0.10%	0.01%	0.001%		Initial	5 minutes
<b>Nonionic Blends</b>															
BIO-SOFT® GSB-9	Nonionic blend	N/A	Proprietary	Liquid	13.3	100	8.26	9	56 <sup>1</sup>	26.6	30.3	37.7	7	13	11
BIO-SOFT® N1-73B	C11 Alcohol ethoxylate	N/A	27	Liquid	11.6	100	8.09	6	38 <sup>1</sup>	27.5	28.3	37	3	9.6	9.5
BIO-SOFT® N-400	C9-11 Alcohol ethoxylate C12-13 alcohol ethoxylate	N/A	301	Liquid	8.8	100	7.79	-10	<25 <sup>1</sup>	26.6	26.9	45.7	9	5.3	4.7
BIO-SOFT® N-600	C12-13 Alcohol ethoxylate	N/A	410	Liquid	10.6	100	7.74	5	<25 <sup>1</sup>	27.4	27.4	27.2	15	4.5	4
BIO-SOFT® N-900	C9-11 Alcohol ethoxylate	N/A	484	Liquid	13	95	8.34	6	64 <sup>1</sup>	29.5	35.8	55.9	8	12	11
BIO-SOFT® N-901	C9-11 Alcohol ethoxylate C12-13 alcohol ethoxylate	N/A	437	Liquid	12	96	8.19	5	40 <sup>1</sup>	27	28.4	47.7	6	11.8	10.5
BIO-SOFT® N-905	C9-11 Alcohol ethoxylate C12-15 alcohol ethoxylate	N/A	462	Liquid	12	95	8.22	5	51 <sup>1</sup>	27.6	27.9	34.7	18	11.5	10.8
BIO-SOFT® N-1200	C9-11 Alcohol ethoxylate C12-15 alcohol ethoxylate	N/A	585	Liquid	13.5	95	8.41	18	80 <sup>1</sup>	31.2	32.3	38	18	11.4	10.6
STEPOSOL® DG	Nonionic/Cationic blend	N/A	Proprietary	Liquid	N/A	98 min.	8.86	-22	>100 <sup>1</sup>	27.8	33	52.6	18	12.5	11.3

<sup>1</sup> 1% in water      <sup>4</sup> 2% in 33% Ethylene glycol monobutyl ether aqueous      <sup>7</sup> 2% in 10% NaCl aqueous      <sup>10</sup> 5g in 25g BDG1 25%  
<sup>2</sup> 1% in 5% NaCl aqueous      <sup>5</sup> 1% in 1% NaCl aqueous      <sup>8</sup> 5% in water  
<sup>3</sup> 1% in 10% NaCl aqueous      <sup>6</sup> 10% in 25% Diethylene glycol butyl ether      <sup>9</sup> 10% in water

Visit [www.stepan.com/alkoxylates](http://www.stepan.com/alkoxylates) for more information.