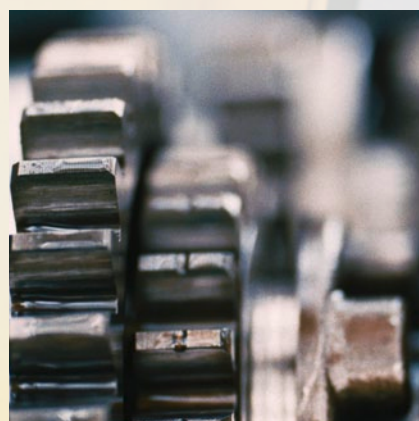


# Base Stocks for Lubricants and Components for Metalworking Fluids

Selection Guide





## Product Groups

### Base Stocks

#### Esters

Complex/Polyol Esters	5–6
Methyl Esters	6
Mono Esters	6
Diesters	7

#### Polyalkylene Glycols (PAGs)

Water Soluble PAGs	8
Water Insoluble PAGs	8
High Viscosity Base Stock	9
HFC Hydraulic Fluid	9

### Metalworking Components

#### Surfactants & Emulsifiers

Alkoxylates	10
EO/PO Block Co-polymers	10–11

#### Coupling Agents/Solubilisers

Fatty Alcohols	11
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#### Corrosion Inhibitors

	11
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#### Foam Control Agents

	11
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## Applications

### Base Stocks

#### Esters

Complex/Polyol Esters	12–15
Methyl Esters	14–15
Mono Esters	16–17
Diesters	16–17

#### Polyalkylene Glycols (PAGs)

Water Soluble PAGs	18–19
Water Insoluble PAGs	18–19
High Viscosity Base Stock	20–21
HFC Hydraulic Fluid	20–21

### Metalworking Components

#### Surfactants & Emulsifiers

Alkoxylates	22–23
EO/PO Block Co-polymers	24–25

#### Coupling Agents/Solubilisers

Fatty Alcohols	26–27
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#### Corrosion Inhibitors

	26–27
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#### Foam Control Agents

	26–27
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## Features and Benefits

### Base Stocks

#### Esters

Complex/Polyol Esters	28–29
Methyl Esters	29–31
Mono Esters	31
Diesters	31

#### Polyalkylene Glycols (PAGs)

Water Soluble PAGs	32
Water Insoluble PAGs	32–33
High Viscosity Base Stock	33
HFC Hydraulic Fluid	33

### Metalworking Components

#### Surfactants & Emulsifiers

Alkoxylates	34–35
EO/PO Block Co-polymers	35–36

#### Fatty Alcohols

Fatty Alcohols	36
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#### Corrosion Inhibitors

	37
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#### Foam Control Agents

	37
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## Chemical and Physical Properties

### Base Stocks

#### Esters

Complex/Polyol Esters	38–41
Methyl Esters	40–41
Mono Esters	42–43
Diesters	42–43

#### Polyalkylene Glycols (PAGs)

Water Soluble PAGs	44–45
Water Insoluble PAGs	44–47
High Viscosity Base Stock	46–47
HFC Hydraulic Fluid	46–47

### Metalworking Components

#### Surfactants & Emulsifiers

Alkoxylates	48–51
EO/PO Block Co-polymers	50–51

#### Coupling Agents/Solubilisers

Fatty Alcohols	52–53
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#### Corrosion Inhibitors

	54–55
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#### Foam Control Agents

	54–55
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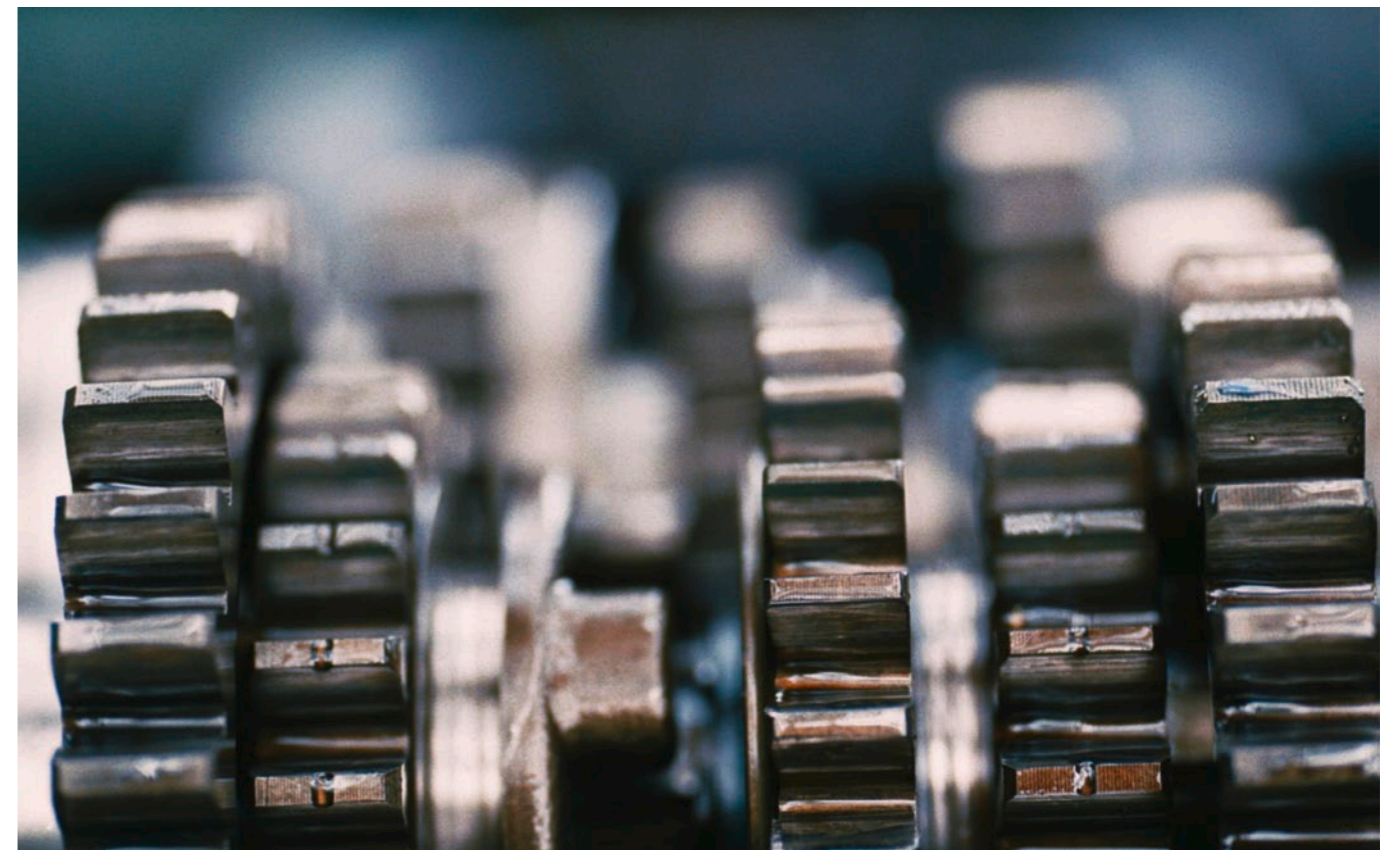
## Product Groups

### Base Stocks

ESTERS					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
<b>Complex / Polyol Esters</b>					
Synative® ES 875	AP			•	
Synative® ES 818 N	AP			•	
Synative® ES 932T	NA		•	•	•
Synative® ES 1200	EU	•	•	•	•
Synative® ES 2344	NA	•	•	•	•
Synative® ES 2873	NA	•	•	•	•
Synative® ES 2902	NA		•	•	•
Synative® ES 2905	NA	•	•	•	•
Synative® ES 2908	NA	•	•	•	•
Synative® ES 2917	NA	•	•	•	•
Synative® ES 2918	NA	•	•	•	•
Synative® ES 2920	NA	•	•	•	•
Synative® ES 2925	NA		•	•	•
Synative® ES 2929	NA	•	•	•	•
Synative® ES 2931	NA	•	•	•	•
Synative® ES 2934	NA	•	•	•	•
Synative® ES 2939	NA	•	•	•	•
Synative® ES 2962	NA	•	•	•	•
Synative® ES 2964	NA	•	•	•	•
Synative® ES 3157	EU	•	•	•	•

ESTERS					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
<b>Complex/Polyol Esters (continued)</b>					
Synative® ES 3237	EU	•	•	•	•
Synative® ES 3345	EU	•	•	•	•
Synative® ES PEC 4	EU	•	•	•	•
Synative® ES TMP 05	EU, AP	•	•	•	•
Synative® ES TMP 05 H	EU	•	•	•	•
Synative® ES TMP 05/68	EU	•	•	•	•
Synative® ES TMP 05/140	EU	•	•	•	•
Synative® ES TMP 05/320	EU	•	•	•	•
Synative® ES TMP 05/1000	EU	•	•	•	•
Synative® ES TMTC	EU, AP	•		•	•
Synative® ES GTO	NA, EU	•	•	•	•
<b>Methyl Esters</b>					
Synative® ES 2301	NA		•	•	•
Synative® ES 932M	NA		•	•	•
Synative® ES 8309	EU	•		•	
Synative® ES ME TI 05	EU	•		•	
Synative® ES ME V	EU	•		•	
Synative® ES ME V 05	EU	•		•	
Synative® ES ME C12/98-100	EU	•		•	
Synative® ES ME PK 12-18	EU	•		•	
<b>Mono Esters</b>					
Synative® ES 9846	NA		•	•	•
Synative® ES 2911	NA	•	•	•	•
Synative® ES EHK	EU	•			
Synative® ES EHO	EU, AP	•		•	
Synative® ES EHO V	EU	•			
Synative® ES EHPA	EU	•	•	•	•
Synative® ES EHTI	EU	•	•	•	•
Synative® ES ITS	EU	•		•	•

ESTERS					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
<b>Diesters</b>					
Synative® ES 2900	NA		•	•	•
Synative® ES 2958	NA	•	•	•	•
Synative® ES 2960	NA	•	•	•	•
Synative® ES 2970	NA, EU	•	•	•	•
Synative® ES 2971	NA	•	•	•	•
Synative® ES 2976	EU, NA	•	•	•	•
Synative® ES DEHS	EU	•			
Synative® ES DITA	EU, NA	•	•	•	•
Synative® ES DNA	EU, NA	•	•	•	•
Synative® ES DPHA	EU, NA	•	•	•	•
Synative® ES DEHA	EU	•	•	•	•



POLYALKYLENE GLYCOLS (PAGS)					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
<b>Water Soluble PAGs</b>					
Breox® 50 A 20	EU	•	•	•	•
Breox® 50 A 50	EU	•	•	•	•
Breox® 50 A 140	EU	•	•	•	•
Breox® 45 A 380	EU	•	•	•	•
Breox® 43 A 1000	EU	•	•	•	•
Breox® 50 A 1000	EU	•	•	•	•
Breox® 60 W 1000	EU	•	•	•	•
Breox® 75 W 270	EU	•	•	•	•
Plurasafe® WS 330 B	NA		•		•
Plurasafe® WS 600 B	NA		•		•
Plurasafe® WS 660	NA		•		•
Plurasafe® WS 1147 D	NA		•		•
Plurasafe® WS D 60 - 460	NA		•		•
<b>Water Insoluble PAGs</b>					
Breox® B 35	EU	•		•	
Breox® B 75	EU	•		•	
Breox® B 125	EU	•		•	
Breox® B 225	EU	•		•	
Breox® B 335	EU	•		•	
Breox® IL 1007	EU	•		•	
Plurasafe® WI 135	NA		•	•	•
Plurasafe® WI 165	NA		•	•	•
Plurasafe® WI 250	NA		•	•	•
Plurasafe® WI 285	NA		•	•	•
Plurasafe® WI 385	NA		•	•	•
Plurasafe® WI 600 D	NA		•	•	•
Plurasafe® WI 625	NA		•	•	•
Plurasafe® WI 700 D	NA		•	•	•

\*Breox® is a registered trade mark of BP plc and is used by BASF under licence

POLYALKYLENE GLYCOLS (PAGS)					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
<b>High Viscosity PAGs</b>					
Breox® 75 W 18000	EU	•	•	•	•
Breox® 75 W 55000	EU	•	•	•	•
Breox® 75 W 2050	EU	•	•	•	•
Breox® TB 110	EU	•	•	•	•
Breox® TB 120	EU	•	•	•	•
Breox® TB 150	EU	•	•	•	•
Breox® TB 170	EU	•	•	•	•
Breox® TB 195	EU	•	•	•	•
Pluracol® V10	NA	•	•	•	•
Pluracol® V 1075	NA	•	•	•	•
Plurasafe® WS 5100	NA	•	•	•	•
Plurasafe® WT 90000	NA	•	•	•	•
<b>Fire Resistant (HFC) Hydraulic fluid</b>					
Breox® NF 46 4005	EU	•		•	



## Metalworking Components

METALWORKING COMPONENTS					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
<b>Surfactants and Emulsifiers (Alkoxyates)</b>					
Synative® AC B 33 V	EU	•	•	•	•
Synative® AC 2142	EU	•	•	•	•
Synative® AC 3370 V	EU	•	•	•	•
Synative® AC 3412 V	EU	•	•	•	•
Synative® AC 3499	EU	•	•	•	•
Synative® AC 3830	EU	•	•	•	•
Synative® AC 5102	EU	•	•	•	•
Synative® AC EP 5 LV	EU	•	•	•	•
Synative® AC ET 5 V	EU	•	•	•	•
Synative® AC K 100	EU	•	•	•	•
Synative® AC LS 4 L	EU	•	•	•	•
Synative® AC LS 24	EU	•	•	•	•
Synative® AC LS 54	EU	•	•	•	•
Synative® AC OCP 502	EU	•	•	•	•
Synative® AC RT 5	EU	•	•	•	•
Synative® AC RT 40	EU	•	•	•	•
Synative® AC PWM 2	EU	•	•	•	•
Synative® XA 40	EU	•	•	•	•
Synative® XA 60	EU	•	•	•	•
Synative® X AO 3	EU	•	•	•	•
Synative® X LF 403	EU	•	•	•	•
Synative® X 700	NA, EU, AP	•	•	•	•
Synative® X 710	NA, EU, AP	•	•	•	•
Synative® X 720	NA, EU, AP	•	•	•	•
Synative® X 730	NA, EU, AP	•	•	•	•
<b>Surfactants and Emulsifiers (EO/PO Block Co-polymers)</b>					
Breox® E 200	EU	•	•	•	•
Breox® E 400	EU	•	•	•	•
Breox® E 600	EU	•	•	•	•
Synative® 17R2	NA		•	•	•
Synative® 17R4	NA		•	•	•
Synative® PE 6100	EU	•	•	•	•

NA = NAFTA    EU = Europe    AP = Asia Pacific

Manufacturing Locations

METALWORKING COMPONENTS					
Product Name	Manufacturing Location	Availability			
		Europe & EAWA	NA	AP	LA
Synative® PE 6400	EU	•	•	•	•
Synative® PE 6800	EU	•	•	•	•
Synative® PE 10100	EU	•	•	•	•
Synative® RPE 1720	EU	•		•	
Synative® RPE 1740	EU	•		•	
Synative® RPE 2520	EU	•	•	•	•
Synative® X 300	NA	•	•	•	•
Synative® X 310	NA	•	•	•	•
Synative® X 320	NA	•	•	•	•
<b>Coupling Agents / Solubilisers (Fatty Alcohols)</b>					
Synative® AL 50/55 V	EU	•	•	•	•
Synative® AL 80/85 V	EU	•	•	•	•
Synative® AL 90/95 V	EU	•	•	•	•
Synative® AL C12/98-100	EU	•	•	•	•
Synative® AL C12-C14 50/50	EU	•	•	•	•
Synative® AL G 16	EU	•	•	•	•
Synative® AL G 20	EU	•	•	•	•
Synative® AL S	EU	•	•	•	•
Synative® AL T	EU	•	•	•	•
<b>Corrosion Inhibitors</b>					
Synative® AC 3499	EU	•	•	•	•
Synative® CI 500	EU	•	•	•	•
Synative® CI 510	EU	•	•	•	•
Irgacor® L 190 PLUS	EU	•	•	•	•
<b>Foam Control Agents</b>					
Breox® FCC P12	EU	•	•	•	•
Synative® AC AMH 2	EU	•	•	•	•
<b>MWF Packages</b>					
Irgamulse® 6030	AP			•	
Irgamulse® 6040 M	AP			•	
Irgamulse® 6070	AP			•	
Irgamulse® 6070 S	AP			•	

Availability – Please check with regional sales teams for guidance.

# Applications

## Base Stocks

ESTERS																
Product Name	Description	Main Application														
		Transportation				Industrial					Metalworking Fluid			Additives		
		Transmission Oils	Axle Oils	2 Stroke Oil	4 Stroke Oil	Industrial Gear Oils	Hydraulic Fluids	Compressor Oils	Turbine Lubricants	Chain Lubricants	Greases	Water Miscible Fluids	Neat Oils	Steel Rolling Oils	Aluminium Processing	Lube Additives
<b>Complex / Polyol Esters</b>																
Synative® ES 875	Caprylic Capric triglyceride ester											•				
Synative® ES 818N	C8 to C18 glycerine ester											•				
Synative® ES 932T	TMP ester of monomer acid			•			•				•	•				
Synative® ES 1200	Complex ester	•	•			•				•	•				•	
Synative® ES 2344	Tetraethylene glycol bis 2-ethylhexanoate			•									•		•	
Synative® ES 2873	PE ester of dimer acid			•							•	•				•
Synative® ES 2902	Complex ester										•		•	•	•	•
Synative® ES 2905	Complex ester			•							•	•	•	•	•	•
Synative® ES 2908	Complex ester										•	•	•	•		•
Synative® ES 2917	NPG ester of fatty acids			•	•				•							
Synative® ES 2918	PE ester of fatty acids	•								•	•					
Synative® ES 2920	TMP ester of fatty acids	•	•	•	•			•	•							
Synative® ES 2925	TMP ester of fatty acids	•	•	•	•					•	•					
Synative® ES 2929	PE ester of fatty acids								•							
Synative® ES 2931	PE ester of fatty acids				•		•	•								
Synative® ES 2934	TMP ester of fatty acids	•	•	•	•		•	•		•	•					
Synative® ES 2939	PE ester of fatty acids			•				•								
Synative® ES 2962	Complex ester			•			•				•					
Synative® ES 2964	TMP Trioleate			•			•				•	•	•			

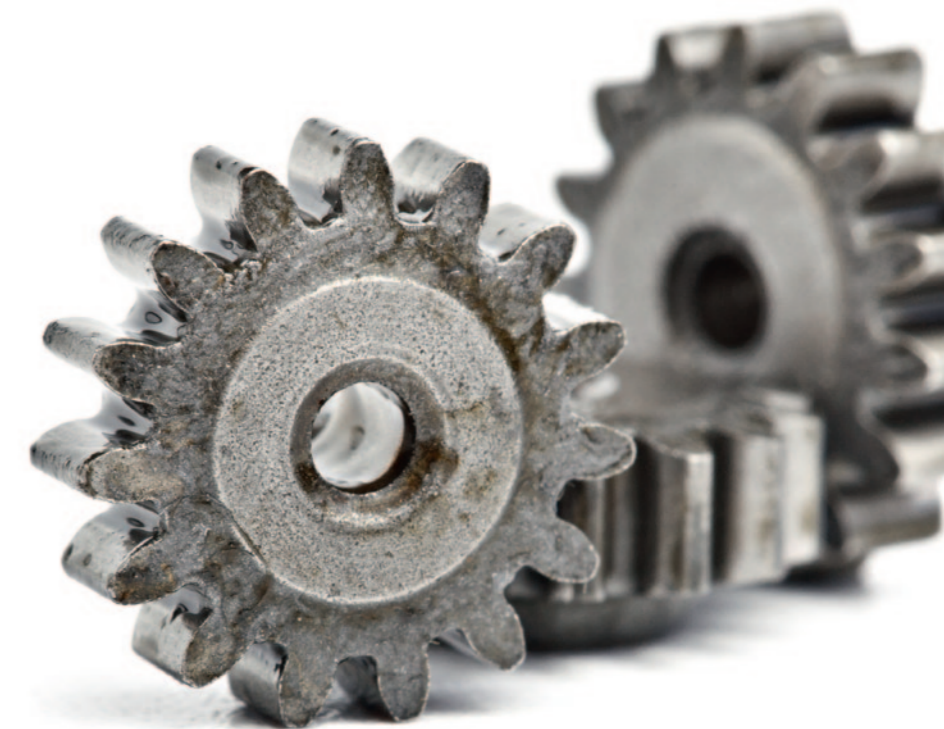




ESTERS																
Product Name	Description	Main Application														
		Transportation				Industrial					Metalworking Fluid				Additives	
		Transmission Oils	Axle Oils	2 Stroke Oil	4 Stroke Oil	Industrial Gear Oils	Hydraulic Fluids	Compressor Oils	Turbine Lubricants	Chain Lubricants	Greases	Water Miscible Fluids	Neat Oils	Steel Rolling Oils	Aluminium Processing	Lube Additives
<b>Mono Esters</b>																
Synative® ES 9846	2-Ethylhexyl oleate			•							•	•	•			•
Synative® ES 2911	Isodecyl pelargonate			•			•								•	
Synative® ES EHK	2-Ethylhexyl cocoate						•				•	•				•
Synative® ES EHO	2-Ethylhexyl oleate			•			•				•	•	•			•
Synative® ES EHO V	2-Ethylhexyl oleate (from veg oleic acid)			•			•				•	•	•			•
Synative® ES EHPA	2-Ethylhexyl palmitate										•	•				•
Synative® ES EHTI	2-Ethylhexyl tallowate										•	•				•
Synative® ES ITS	Isotridecyl stearate															•
<b>Diesters</b>																
Synative® ES 2900	2-Ethylhexyl ester of dimer acid			•		•				•	•	•	•	•		•
Synative® ES 2958	Di-2-ethylhexyl azelate	•	•	•							•					
Synative® ES 2960	Di-isodecyl azelate	•	•	•	•						•					
Synative® ES 2970	Di-isodecyl adipate (DIDA)	•	•	•	•	•					•					
Synative® ES 2971	Di-iso tridecyl adipate (DITA/DTDA)	•	•	•	•	•	•	•			•					
Synative® ES 2976	Di-iso octyl adipate (DIOA)	•	•	•	•	•					•					
Synative® ES DEHS	Di-(2-ethylhexyl) sebacate	•	•								•					
Synative® ES DITA	Di-(isotridecyl) adipate (DITA/DTDA)	•	•	•	•	•	•	•			•		•			
Synative® ES DNA	Di-isononyl adipate	•	•	•	•	•					•					
Synative® ES DPHA	Di-(2-propylheptyl) adipate	•	•	•	•	•					•					
Synative® ES DEHA	Di-(2-ethylhexyl) adipate	•	•	•	•	•					•					

POLYALKYLENE GLYCOLS (PAGS)										
Product Name	Description	Main Application								
		Industrial					Metalworking Fluid			
		Industrial Gear Oils	Hydraulic Fluids	Chain Lubricants	Compressor Lubricants	High Temp Lubricants	Textile Lubricants	Metal Working Fluids	Aluminium Processing	Quenching
<b>Water Soluble PAGs</b>										
Breox® 50 A 20	EO/PO random co-polymer	•	•							
Breox® 50 A 50	EO/PO random co-polymer	•	•				•	•	•	
Breox® 50 A 140	EO/PO random co-polymer	•	•	•			•	•	•	
Breox® 45 A 380	EO/PO random co-polymer	•		•				•	•	
Breox® 43 A 1000	EO/PO random co-polymer	•		•						
Breox® 50 A 1000	EO/PO random co-polymer	•		•						
Breox® 60 W 1000	EO/PO random co-polymer	•								
Breox® 75 W 270	EO/PO random co-polymer						•	•		
Plurasafe® WS 330 B	EO/PO random co-polymer	•	•	•		•	•	•		•
Plurasafe® WS 600 B	EO/PO random co-polymer	•	•	•		•	•	•		•
Plurasafe® WS 660	EO/PO random co-polymer	•	•	•		•	•	•		•
Plurasafe® WS 1147 D	EO/PO random co-polymer	•			•		•	•		•
Plurasafe® WS D 60-460	EO/PO random co-polymer									
<b>Water Insoluble PAGs</b>										
Breox® B 35	PO homo-polymer	•	•		•					
Breox® B 75	PO homo-polymer	•	•		•					
Breox® B 125	PO homo-polymer	•	•		•			•	•	
Breox® B 225	PO homo-polymer	•						•	•	
Breox® B 335	PO homo-polymer	•		•				•	•	
Breox® IL 1007	PO homo-polymer	•		•						
Pluronic® WI 135	PO homo-polymer	•	•		•	•				•
Plurasafe® WI 165	PO homo-polymer	•	•		•	•				•
Plurasafe® WI 250	PO homo-polymer	•	•		•	•				•
Plurasafe® WI 285	PO homo-polymer	•	•		•	•				•
Pluronic® WI 385	PO homo-polymer	•	•		•	•				•
Plurasafe® WI 600 D	PO homo-polymer	•	•		•	•				•
Plurasafe® WI 625	PO homo-polymer	•	•		•	•				•
Plurasafe® WI 700 D	PO homo-polymer	•	•		•	•				•

POLYALKYLENE GLYCOLS (PAGS)											
Product Name	Description	Main Application									
		Industrial						Metalworking Fluid			
		Industrial Gear Oils	Hydraulic Fluids	Chain Lubricants	Compressor Lubricants	High Temp Lubricants	Textile Lubricants	Metal Working Fluids	Aluminium Processing	Quenching	Mill & Calendar
<b>High Viscosity PAGs</b>											
Breox® 75 W 18000	EO/PO random co-polymer	•	•	•	•	•	•	•		•	•
Breox® 75 W 55000	EO/PO random co-polymer	•	•	•	•	•	•	•		•	•
Breox® 75 W 2050	EO/PO random co-polymer	•	•	•		•	•	•			•
Breox® TB 110	75 % Breox 75W 55000 + 25 % water		•					•			
Breox® TB 120	60 % Breox 75W 55000 + 40 % water		•					•			
Breox® TB 150	70 % Breox 75W 18000 + 30 % water		•					•			
Breox® TB 170	70 % Breox 75W 30000 + 30 % water		•					•			
Breox® TB 195	60 % Breox 75W 18000 + 40 % water		•					•		•	
Pluracol® V10	EO/PO random co-polymer	•	•	•	•	•	•	•		•	•
Pluracol® V 1075	75 % Pluracol V10 + 25 % water	•	•	•	•	•	•	•		•	•
Pluracol® WS 5100	EO/PO random co-polymer	•	•	•	•	•	•	•		•	•
Pluracol® WT 90000	EO/PO random co-polymer	•	•	•	•	•	•	•		•	•
<b>Fire Resistant (HFC) Hydraulic fluid</b>											
Breox® NF46 4005	Fire resistant hydraulic fluid (HFC)		•								



# Metalworking Components

SURFACTANTS & EMULSIFIERS		Main Application						
Product Name	Description	Industrial		Metalworking Fluid				
		Greases	Foam Control	Water miscible	Neat Oils	Steel Rolling Oils	Aluminium Processing	Corrosion inhibitor
<b>Alkoxylates</b>								
Synative® AC B33 V	Saturated and unsaturated fatty acid ethoxylate			•				
Synative® AC 2142	Castor oil ethoxylate			•				
Synative® AC 3370 V	Fatty alcohol ethoxylate (veg based)			•		•		
Synative® AC 3412 V	Fatty alcohol ethoxylate (veg based)			•		•		
Synative® AC 3499	Fatty acid monoethanolamide derivative, free from secondary amines			•		•		
Synative® AC 3830	Fatty alcohol ethoxylate (veg based)			•		•		
Synative® AC 5102	Fatty alcohol ethoxylate (veg based)			•		•		
Synative® AC EP 5 LV	Fatty alcohol ethoxylate (veg based)			•		•		
Synative® AC ET 5 V	Fatty alcohol ethoxylate (veg based)			•		•		
Synative® AC K 100	Cocoamine ethoxylate			•				
Synative® AC LS 4 L	Lauric alcohol ethoxylate			•				
Synative® AC LS 24	Fatty alcohol ethoxylate (veg based)			•				
Synative® AC LS 54	Fatty alcohol ethoxylate (veg based)			•				
Synative® AC OCP 502	Tallow alcohol propoxylate			•				
Synative® AC RT 5	Castor oil ethoxylate			•		•		
Synative® AC RT 40	Castor oil ethoxylate			•				
Synative® AC PWM 2	Fatty alcohol ethoxylate			•				
Synative® XA 40	Guerbet alcohol ethoxylate			•				
Synative® XA 60	Guerbet alcohol ethoxylate			•				
Synative® X AO 3	Oxo alcohol ethoxylate			•				
Synative® X LF 403	Mixture of branched and linear alcohol propoxylates			•				
Synative® X 700	Fatty alcohol ethoxylate (veg based)			•				
Synative® X 710	Fatty alcohol ethoxylate (veg based)			•				
Synative® X 720	Fatty alcohol ethoxylate (veg based)			•				
Synative® X 730	Fatty alcohol ethoxylate (veg based)			•				



SURFACTANTS & EMULSIFIERS		Main Application						
Product Name	Description	Industrial		Metalworking Fluid				
		Greases	Foam Control	Water miscible	Neat Oils	Steel Rolling Oils	Aluminium Processing	Corrosion inhibitor
<b>EO/PO Block Co-Polymers</b>								
Breox® E 200	Polyethylene glycol			•				
Breox® E 400	Polyethylene glycol			•				
Breox® E 600	Polyethylene glycol			•				
Synative® 17R2	EO/PO block co-polymer			•				
Synative® 17R4	EO/PO block co-polymer			•				
Synative® PE 6100	EO/PO block co-polymer			•				
Synative® PE 6400	EO/PO block co-polymer			•				
Synative® PE 6800	EO/PO block co-polymer			•				
Synative® PE 10100	EO/PO block co-polymer			•				
Synative® RPE 1720	EO/PO block co-polymer			•				
Synative® RPE 1740	EO/PO block co-polymer			•				
Synative® RPE 2520	EO/PO block co-polymer			•				
Synative® X300	EO/PO block co-polymer			•				
Synative® X310	EO/PO block co-polymer			•				
Synative® X320	EO/PO block co-polymer			•				



COUPLING AGENTS/SOLUBILISERS								
Product Name	Description	Main Application						
		Industrial		Metalworking Fluid				
		Greases	Foam Control	Water miscible	Neat Oils	Steel Rolling Oils	Aluminium Processing	Corrosion inhibitor
<b>Fatty Alcohols</b>								
Synative® AL 50/55 V	Oleyl/Cetyl alcohol based on vegetable raw materials	•		•	•			
Synative® AL 80/85 V	Oleyl/Cetyl alcohol based on vegetable raw materials	•		•	•			
Synative® AL 90/95 V	Oleyl/Cetyl alcohol based on vegetable raw materials	•		•	•			
Synative® AL C12/98-100	Lauryl Alcohol							
Synative® AI C12-C14 50/50	Saturated C12-14 fatty alcohols							
Synative® AL G 16	C16 Guerbet alcohol	•		•	•			
Synative® AL G 20	C20 Guerbet alcohol	•		•	•			
Synative® AL S	Fatty alcohol C12 to C14	•					•	
Synative® AL T	Fatty alcohol C12 to C18	•					•	
<b>CORROSION INHIBITORS</b>								
Synative® AC 3499	Fatty acid monoethanolamide derivative, free from secondary amines			•	•	•		•
Synative® CI 500	Alkyl phosphate ester			•	•	•		•
Synative® CI 510	Polyether phosphate ester			•	•	•		•
Irgacor® L 190 PLUS	Polycarboxylic acid			•				•
<b>FOAM CONTROL AGENTS</b>								
Breox® FCC P12	100% Active polyalkylene glycol non-ionic surfactant		•	•				
Synative® AC AMH 2	Mixture of foam control compounds		•	•				



# Features and Benefits

## Base Stocks

ESTERS		
Product Name	Description	Features and Benefits
<b>Complex / Polyol Esters</b>		
Synative® ES 875	Caprylic Capric triglyceride ester	Good for MWF – broaching and forming application (eg aluminium beer cans)
Synative® ES 818N	C8 to C18 glycerine ester	Good for MWF – broaching and forming application (eg aluminium beer cans)
Synative® ES 932T	TMP ester of monomer acid	Cost effective performance compared to TMP oleate. Good for MWF applications, greases, hydraulic fluids. Easy to emulsify. Biobased, biodegradable.
Synative® ES 1200	Complex ester	Good thermal, oxidative and hydrolytic properties. High VI and shear stable. Good solvency properties for additives. High viscosity base stock used for thickening. Lower co-efficient of friction and thus energy efficient compared to mineral oil and PAO base stocks. Biodegradable and high renewable content.
Synative® ES 2344	Tetraethylene glycol bis 2-ethylhexanoate	Diluent base stock, burns cleanly, leaves no residue.
Synative® ES 2873	PE ester of dimer acid	High viscosity ester with excellent lubricity properties. Very low volatility. Good for 2 stroke engine, chain lubricants and metalworking fluids.
Synative® ES 2902	Complex ester	Easy to emulsify in water based MWF formulations, Low Volatility. Solubility decreases at higher temperatures and thus increases lubrication at heat generating sites. Good solubility for polar additives.
Synative® ES 2905	Complex ester	Provides superior low temperature performance in full synthetic lubricants as well as in petroleum/synthetic blends. Good lubricity. Not water soluble
Synative® ES 2908	Complex ester	Synative® ES 2908 forms a clear solution in water, allowing close examination of machinery and its operation. In addition, the water solubility of this basestock tends to decrease slightly at higher temperatures, resulting in increased lubrication at heat generating sites.
Synative® ES 2917	NPG ester of fatty acids	Excellent thermal and oxidative properties
Synative® ES 2918	PE ester of fatty acids	Biodegradable ester with good thermal and oxidative stability. Good for chain lubricants and greases.
Synative® ES 2920	TMP ester of fatty acids	Excellent thermal and oxidative properties
Synative® ES 2925	TMP ester of fatty acids	Exhibits excellent additive response, low volatility, low temperature performance and superior oxidation / corrosion stability. Applications include compounded lubricants and greases for military and commercial aircraft, stationary turbine engines, and military weapons systems and instruments.

ESTERS		
Product Name	Description	Features and Benefits
Synative® ES 2929	PE ester of fatty acids	Exhibits excellent thermal stability, superior oxidation / corrosion stability, low temperature performance and good additive response. Applications include Aviation turbine oils and stationary turbine engines.
Synative® ES 2931	PE ester of fatty acids	Excellent thermal and oxidative stability. Used in the preparation of MIL-L-23699E turbine lubricants but can be used in other industrial and automotive applications
Synative® ES 2934	TMP ester of fatty acids	Exhibits excellent thermal stability, superior oxidation / corrosion stability, low volatility, low temperature performance and good additive response. Applications include compounded lubricants and greases for military and commercial aircraft, stationary turbine engines, and military weapons systems and instruments.
Synative® ES 2939	PE ester of fatty acids	Exhibits excellent thermal stability, superior oxidation / corrosion stability, low volatility, low temperature performance and good additive response. Applications include Aviation turbine oils and stationary turbine engines.
Synative® ES 2962	Complex ester	Special grade Oleic acid used – low conjugated unsaturation. Like TMP trioleate but better thermal / oxidative properties than standard Trimethylolpropane trioleate. Used in high performance greases
Synative® ES 2964	TMP Trioleate	Excellent lubricity, good hydrolytic stability and low temperature properties. Biodegradable
Synative® ES 3157	Complex ester	Good thermal, oxidative stability and rheology properties
Synative® ES 3237	Complex ester	High viscous rheology modifier. Soluble in mineral oils. Improves lubricity. Good for MWF (Concentrates and neat oil systems)
Synative® ES 3345	Complex ester	Good thermal, oxidative stability and rheology properties
Synative® ES PEC 4	TMP ester of fatty acids	Excellent thermal, hydrolytic and oxidative stability
Synative® ES TMP 05	NPG ester of fatty acids	Excellent lubricity, good hydrolytic stability and low temperature properties. Biodegradable.
Synative® ES TMP 05 H	Polyol ester	Excellent lubricity, good hydrolytic stability and low temperature properties. Improved demulsification properties. Very low acid value 0.2 mg Koh/g oil
Synative® ES TMP 05/68	Trimethylolpropane complex ester	Good low temperature performance and hydrolytic stability. Allows formulator a range of viscosity options
Synative® ES TMP 05/140	Trimethylolpropane complex ester	Good low temperature performance and hydrolytic stability. Allows formulator a range of viscosity options
Synative® ES TMP 05/320	Trimethylolpropane complex ester	Good low temperature performance and hydrolytic stability. Allows formulator a range of viscosity options
Synative® ES TMP 05/1000	Trimethylolpropane complex ester	Good low temperature performance and hydrolytic stability. Allows formulator a range of viscosity options
Synative® ES TMTC	Polyol ester	Excellent hydrolytic and oxidative stability. Good low temperature properties
Synative® ES GTO	Glycerol trioleate	Component for lubricants, carrier for antiwear additives.
<b>Methyl Esters</b>		
Synative® ES 2301	Methyl oleate	Low viscous esters with good solvent properties.
Synative® ES 932M	Methyl ester of monomer acid	Cost effective performance compared to methyl oleate. Good for water based MWF, Easy to emulsify. Biobased, biodegradable.
Synative® ES 8309	Methyl ester of fatty acids	Good lubricity and thermal stability. Used in aluminium rolling as low residue forming.
Synative® ES ME TI 05	Methyl oelate	Low viscous esters with good solvent properties.



## ESTERS

### Product Name

### Description

### Features and Benefits

#### Methyl Esters (continued)

Synative® ES ME V	Methyl oleate (veg source)	Low viscous esters with good solvent properties.
Synative® ES ME V 05	Methyl oleate	Low viscous esters with good solvent properties.
Synative® ES ME C12/98-100	Methyl ester of saturated fatty acid	Good lubrication in Aluminium rolling applications
Synative® ES ME PK 12-18	Methyl ester of fatty acids	Good lubrication in rolling applications

#### Mono Esters

Synative® ES 9846	2-Ethylhexyl oleate	Good lubricity properties and hydrolytic stability. Easy to emulsify
Synative® ES 2911	Isodecyl pelargonate	High thermal and oxidative stability, very low pour point. Biodegradable
Synative® ES EHK	2-Ethylhexyl cocoate	Good lubricity properties and hydrolytic stability. Easy to emulsify
Synative® ES EHO	2-Ethylhexyl oleate	Good lubricity properties and hydrolytic stability. Easy to emulsify
Synative® ES EHO V	2-Ethylhexyl oleate (from veg oleic acid)	Good lubricity properties and hydrolytic stability. Easy to emulsify
Synative® ES EHPA	2-Ethylhexyl palmitate	Good lubricity properties and hydrolytic stability. Easy to emulsify
Synative® ES EHTI	2-Ethylhexyl tallowate	Good lubricity properties and hydrolytic stability. Easy to emulsify
Synative® ES ITS	Isotridecyl stearate	Good lubricity properties and hydrolytic stability. Easy to emulsify

#### Diesters

Synative® ES 2900	2-Ethylhexyl ester of dimer acid	Superior low temperature performance, low volatility
Synative® ES 2958	Di-2-ethylhexyl azelate	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends
Synative® ES 2960	Di-isodecyl azelate	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends
Synative® ES 2970 (DIDA)	Di-isodecyl adipate (DIDA)	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends
Synative® ES 2971	Di-iso tridecyl adipate (DITA/DTDA)	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends
Synative® ES 2976	Di-iso octyl adipate (DIOA)	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends
Synative® ES DEHS	Di-(2-ethylhexyl) sebacate	Outstanding low temperature properties. Excellent thermal and oxidative stability
Synative® ES DITA	Di-(isotridecyl) adipate (DITA/DTDA)	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends
Synative® ES DNA	Di-isononyl adipate	Outstanding low temperature properties. Excellent thermal and oxidative stability
Synative® ES DPHA	Di-(2-propylheptyl) adipate	Identical performance properties to DIDA, can be used to replace DIDA in lubricants
Synative® ES DEHA	Di-(2-ethylhexyl) adipate	Exhibits excellent oxidative and thermal stability. Provides superior low temperature performance in petroleum/synthetic hydrocarbon lubricant blends



POLYALKYLENE GLYCOLS (PAGS)		
Product Name	Description	Features and Benefits
<b>Water Soluble PAGs</b>		
Breox® 50 A 20	EO/PO random co-polymer	High performance water soluble base stock used in gear, bearing and calender and textile lubricants, compressor and metal working formulations.
Breox® 50 A 50	EO/PO random co-polymer	
Breox® 50 A 140	EO/PO random co-polymer	
Breox® 45 A 380	EO/PO random co-polymer	Label Free. High performance water soluble base stock used in gear, bearing, aluminium forming lubricants, and metal working formulations.
Breox® 43 A 1000	EO/PO random co-polymer	Label free. High performance water soluble, high VI base stock, high thermal and oxidative stability. Shear stable.
Breox® 50 A 1000	EO/PO random co-polymer	Water soluble base stock, high thermal and oxidative stability, shear stable. Used in formulating gear, bearing lubricants.
Breox® 60 W 1000	EO/PO random co-polymer	Label free. High performance water soluble, high VI base stock, high thermal, oxidative and shear stability. Used in formulating gear & bearing lubricants.
Breox® 75 W 270	EO/PO random co-polymer	
Plurasafe® WS 330 B	EO/PO random co-polymer	High performance, water soluble base stock with high VI. Exhibit excellent shear stability, film strength, load carrying capacity, thermal and oxidative stability leading to long drain intervals and equipment protection when formulated with additives. Does not form sludges, varnishes, gums or other carbonaceous deposits at high temperature. The products are soluble in cold water but separate out of aqueous solutions at high temperature (inverse solubility). This phenomenon may be utilised to deliver lubricant onto hot metal surfaces or the cutting edge of tools in MWF applications leading to better cooling, decreased tool wear and improved surface finish. Compressed gases including ethylene, methane, hydrogen, and other hydrocarbon based gases have significantly lower solubility in Plurasafe WS fluids than petrochemical based base stocks (mineral oils and PAO's). This makes the Plurasafe ideal for use in formulation of compressor lubricants.
Plurasafe® WS 600 B	EO/PO random co-polymer	
Plurasafe® WS 660	EO/PO random co-polymer	
Plurasafe® WS 1147 D	EO/PO random co-polymer	High performance, water soluble base stock with high VI. Exhibit excellent shear stability, film strength, load carrying capacity, thermal and oxidative stability. Does not form sludges, varnishes, gums or other carbonaceous deposits at high temperature. Provides very good lubricity in water based cutting fluids and easy to flush from metal surfaces.
Plurasafe® WS D 60-460	EO/PO random co-polymer	High performance, water soluble base stock with high VI. Exhibit excellent shear stability, film strength, load carrying capacity, thermal and oxidative stability. Does not form sludges, varnishes, gums or other carbonaceous deposits at high temperature. Water based formulation exhibit good lubricity, low surface tension, good surface wetting and have low foaming properties.
<b>Water Insoluble PAGs</b>		
Breox® B 35	PO homo-polymer	High performance water insoluble base stock used in gear, calender, textile lubricants, compressor and aluminium forming/metalworking formulations.
Breox® B 75	PO homo-polymer	
Breox® B 125	PO homo-polymer	
Breox® B 225	PO homo-polymer	
Breox® B 335	PO homo-polymer	
Breox® IL 1007	PO homo-polymer	High performance water insoluble high VI base stock, high thermal and oxidative stability, shear stable. Used in formulating gear and bearing lubricants.

KEY  
EO = Ethylene Oxide PO = Propylene Oxide

POLYALKYLENE GLYCOLS (PAGS)		
Product Name	Description	Features and Benefits
Plurasafe® WI 135	PO homo-polymer	High performance water insoluble base stock. High VI, high thermal, oxidative and shear stability. Excellent film strength and load carrying capacity, micropitting resistance. Does not form sludges, varnish or gums in operation. Can be used in gear, calender, textile lubricants, compressor and hydraulic oil formulations.
Plurasafe® WI 165	PO homo-polymer	
Plurasafe® WI 250	PO homo-polymer	
Plurasafe® WI 285	PO homo-polymer	
Plurasafe® WI 385	PO homo-polymer	
Plurasafe® WI 600 D	PO homo-polymer	
Plurasafe® WI 625	PO homo-polymer	
Plurasafe® WI 700 D	PO homo-polymer	
<b>High Viscosity PAGs</b>		
Breox® 75 W 18000	EO/PO random co-polymer	High performance water soluble base stock. High thermal and shear stability. Used in quenchants, metal working fluid and water based hydraulic fluid formulation.
Breox® 75 W 55000	EO/PO random co-polymer	High performance water soluble base stock. High thermal and shear stability. Used in quenchants, metal working fluid and water based hydraulic fluid formulation.
Breox® 75 W 2050	EO/PO random co-polymer	High performance water soluble base stock. High thermal and shear stability.
Breox® TB 110	75% Breox 75W55000 + 25% water	75% Active aqueous solution of Breox 75W 55000 for ease of handling.
Breox® TB 120	60% Breox 75W55000 + 40% water	60% Active aqueous solution of Breox 75W 55000 for ease of handling.
Breox® TB 150	70% Breox 75W18000 + 30% water	70% Active aqueous solution of Breox 75W 18000 for ease of handling.
Breox® TB 170	70% Breox 75W30000 + 30% water	High performance water soluble base stock. High thermal and shear stability. Used in quenchants, metal working fluid and water based hydraulic fluid formulation. For FDA approval see "Breox FDA Approvals" table.
Breox® TB 195	60% Breox 75W18000 + 40% water	60% Active aqueous solution of Breox 75W 18000 for ease of handling.
Pluracol® V10	EO/PO random co-polymer	High performance water soluble base stock. High thermal and shear stability. Exhibits newtonian properties. Used in quenchants, metal working fluid and water based hydraulic fluid and lubricant formulations.
Pluracol® V 1075	75% Pluracol V10 + 25% water	High performance water soluble base stock. High thermal and shear stability. Exhibits newtonian properties. Used in quenchants, metal working fluid and water based hydraulic fluid and lubricant formulations.
Pluracol® WS 5100	EO/PO random co-polymer	High performance water soluble base stock. High thermal and shear stability. Exhibits newtonian properties. Used in quenchants, metal working fluid and water based hydraulic fluid and lubricant formulations.
Pluracol® WT 90000	EO/PO random co-polymer	High performance water soluble base stock. High thermal and shear stability. Exhibits newtonian properties. Used in quenchants, metal working fluid and water based hydraulic fluid and lubricant formulations.
<b>Fire Resistant (HFC) Hydraulic fluid</b>		
Breox® NF46 4005	Fire resistant hydraulic fluid concentrate (HFC)	HFC type concentrate. Allows customers to formulate diluted ready to use fluids

## Metalworking Components

EMULSIFIERS		
Product Name	Description	Features and Benefits
<b>Alkoxylates</b>		
Synative® AC B33 V	Saturated and unsaturated fatty acid ethoxylate	Excellent low temperature properties and good emulsification properties, no skin irritation
Synative® AC 2142	Castor oil ethoxylate	Good emulsification properties for stable concentrates with high mineral oil or ester content.
Synative® AC 3370 V	Fatty alcohol ethoxylate (veg based)	Excellent emulsification and low temperature properties. Hard water stable, high solubility in concentrates, no skin irritation
Synative® AC 3412 V	Fatty alcohol ethoxylate (veg based)	Good emulsification properties, hard water stable, high solubility in concentrates, no skin irritation
Synative® AC 3499	Fatty acid monoethanolamide derivative, free from secondary amines	Anti-corrosion properties, co-emulsification behaviour and hard water stable. Provides additional lubrication, good low temperature behaviour and low foaming
Synative® AC 3830	Fatty alcohol ethoxylate (veg based)	Excellent low temperature properties and good emulsification properties. Hard water stable, high solubility in concentrates, no skin irritation
Synative® AC 5102	Fatty alcohol ethoxylate (veg based)	Good emulsification properties, hard water stable, high solubility in concentrates, no skin irritation
Synative® AC EP 5 LV	Fatty alcohol ethoxylate (veg based)	Excellent low temperature properties and good emulsification properties. Hard water stable, high solubility in concentrates, no skin irritation
Synative® AC ET 5 V	Fatty alcohol ethoxylate (veg based)	Good emulsification properties, high solubility in concentrates, hard water stable, no skin irritation
Synative® AC K 100	Cocoamine ethoxylate	Non ionic surfactant with good emulsification properties. Compatible with non-ionic, anionic and cationic surfactants. Good solubility in water.
Synative® AC LS 4 L	Lauric alcohol ethoxylate	Low foaming non ionic surfactant
Synative® AC LS 24	Fatty alcohol ethoxylate (veg based)	Low foaming non ionic surfactant
Synative® AC LS 54	Fatty alcohol ethoxylate (veg based)	Low foaming non ionic surfactant
Synative® AC OCP 502	Tallow alcohol propoxylate	Low foaming non ionic surfactant
Synative® AC RT 5	Castor oil ethoxylate	Good emulsification properties for stable concentrates with high mineral oil or ester content. Excellent low temperature properties
Synative® AC RT 40	Castor oil ethoxylate	Excellent for oil in water emulsions, produces stable emulsions. Used in emulsifying a wide range of oils including esters and mineral oils
Synative® AC PWM 2	Fatty alcohol ethoxylate	Low foaming non ionic surfactant
Synative® XA 40	Guerbet alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
Synative® XA 60	Guerbet alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
Synative® X AO 3	Oxo alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
Synative® X LF 403	Mixture of branched and linear alcohol propoxylates	Defoaming surfactants, Excellent wetting performance, biodegradable

EMULSIFIERS		
Product Name	Description	Features and Benefits
Synative® X 700	Guerbet alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
Synative® X 710	Guerbet alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
Synative® X 720	Guerbet alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
Synative® X 730	Guerbet alcohol ethoxylate	Non ionic surfactants, compatible with common anionic, cationic and nonionic surfactants. Good wetting, dispersing and emulsification properties. Can be used to substitute for APEO type surfactants.
<b>EO/PO Block Co-Polymers</b>		
Breox® E 200	Polyethylene glycol	Good solubilisers, dispersant and have lubricating properties. Also have good mould release performance. Used in water based metal working fluids.
Breox® E 400	Polyethylene glycol	Good solubilisers, dispersant and have lubricating properties. Also have good mould release performance. Used in water based metal working fluids.
Breox® E 600	Polyethylene glycol	Good solubilisers, dispersant and have lubricating properties. Also have good mould release performance. Used in water based metal working fluids.
Synative® 17R2	EO/PO block co-polymer	Low/non foaming, non ionic surfactants. Good for use in elevated temperatures, easy to wash off and do not form tarry residues. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties. Excellent for forming very stable emulsions.
Synative® 17R4	EO/PO block co-polymer	Low/non foaming, non ionic surfactants. Good for use in elevated temperatures, easy to wash off and do not form tarry residues. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties. Excellent for forming very stable emulsions.
Synative® PE 6100	EO/PO block co-polymer	Low foaming, non ionic surfactant. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® PE 6400	EO/PO block co-polymer	Low foaming, non ionic surfactant. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® PE 6800	EO/PO block co-polymer	Low foaming, non ionic surfactant. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® PE 10100	EO/PO block co-polymer	Low foaming, non ionic surfactant. May also suppress foaming from other surfactants in the formulation. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® RPE 1720	EO/PO block co-polymer	Low/non foaming, non ionic surfactants. Good for use in elevated temperatures, easy to wash off and do not form tarry residues. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties. Excellent for forming very stable emulsions.

**EMULSIFIERS**

Product Name	Description	Features and Benefits
<b>EO/PO Block Co-Polymers (continued)</b>		
Synative® RPE 1740	EO/PO block co-polymer	Low/non foaming, non ionic surfactants. Good for use in elevated temperatures, easy to wash off and do not form tarry residues. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties. Excellent for forming very stable emulsions.
Synative® RPE 2520	EO/PO block co-polymer	Low/non foaming, non ionic surfactants. Good for use in elevated temperatures, easy to wash off and do not form tarry residues. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® X 300	EO/PO block co-polymer	Low foaming, non ionic surfactant. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® X310	EO/PO block co-polymer	Low foaming, non ionic surfactant. Good compatibility with hard water. Good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.
Synative® X320	EO/PO block co-polymer	Low foaming, non ionic surfactant. Good compatibility with hard water. Very good wetting, dispersing and emulsifying performance. Also exhibits lubricating properties.

**FATTY ALCOHOLS**

<b>Fatty Alcohols</b>		
Product Name	Description	Features and Benefits
Synative® AL 50/55 V	Oleyl/Cetyl alcohol based on vegetable raw materials	Good solubility in esters and mineral oils, high additive compatibility, foam reducing properties
Synative® AL 80/85 V	Oleyl/Cetyl alcohol based on vegetable raw materials	Good solubility in esters and mineral oils, high additive compatibility, foam reducing properties, good low temperature properties
Synative® AL 90/95 V	Oleyl/Cetyl alcohol based on vegetable raw materials	Good solubility in esters and mineral oils, high additive compatibility, foam reducing properties, good low temperature properties
Synative® AL C12/98-100	Lauryl alcohol	Good for aluminium processing, minimal quantity lubrication, solubilizer in emulsion concentrates
Synative® AI C12-C14 50/50	Saturated C12-14 fatty alcohols	Good for aluminium processing, minimal quantity lubrication, solubilizer in emulsion concentrates
Synative® AL G 16	Guerbet alcohol	Excellent low temperature properties, solubility in esters and mineral oils, outstanding oxidation stability, high additive compatibility
Synative® AL G 20	Guerbet alcohol	Very good low temperature properties, solubility in esters and mineral oils, outstanding oxidation stability, high additive compatibility
Synative® AL S	Fatty alcohol C12 to C14	High oxidation stability, good additive compatibility, antifoaming effect
Synative® AL T	Fatty alcohol C12 to C18	High oxidation stability, good additive compatibility, antifoaming effect

**CORROSION INHIBITORS**

Product Name	Description	Features and Benefits
Synative® AC 3499	Fatty acid monoethanolamide derivative, free from secondary amines	Anti-corrosion properties, co-emulsification behaviour and hard water stable. Provides additional lubrication, good low temperature behaviour and low foaming
Synative® CI 500	Alkyl phosphate ester	Good for Steel, Very good for Aluminium and combination of aluminum with Brass. Oil Soluble. Water soluble when used with alkanol amines. Biodegradable
Synative® CI 510	Polyether phosphate ester	Good for steel and aluminium. Lubricating properties. Biodegradable
Irgacor® L 190 PLUS	Polycarboxylic acid	Good corrosion inhibition of multimetal systems, compatible with hard water system. Does not form films or gums on metal surfaces. Low foaming and excellent air release. No tendency to form nitrosoamines.
<b>FOAM CONTROL AGENTS</b>		
Breox® FCC P12	100 % Active polyalkylene glycol non-ionic surfactant	High performance Foam Control Agent designed specifically for low temperature use (10–30° C), in cold water applications such as vegetable and starch processing and paper manufacturing. For FDA approval see "FDA Approvals" table
Synative® AC AMH 2	Mixture of foam control compounds	Excellent defoaming effect in neat oils in small concentrations, soluble in esters and mineral oils



# Chemical and Physical Properties\*

## Base Stocks

ESTERS																		
Product Name	Description	Kinematic Viscosity		Viscosity Index	Density	Acid Value		Iodine Value	Saponification Value	Hydroxyl Value	Cloud Point	Flash Point	Pour Point	NOACK	Biodegradable	Thermal & Oxidative Stability	Superior Low Temperature Performance	Low Volatility
		mm <sup>2</sup> /s (40° C)	mm <sup>2</sup> /s (100° C)		g/cm <sup>3</sup> 20° C	mg KOH/g		g I/100g	mg KOH/g	mg KOH/g	°C	°C	°C	% Weight loss				
		ASTM D 445/ DIN 51562		D-2270/ DIN ISO 2909	DIN 51757	ASTM D-974/ DGF C-V 2		DGF C-V 11b	DIN 53401	AOCS Cd 13-60	ISO 3015	ASTM D-92/ DIN EN ISO 2592	ASTM D-97/ DIN ISO 3016	DIN 51581/ CEC L 40 T 87				
Complex/Polyol Esters																		
Synative® ES 875	Caprylic Capric triglyceride ester	13.4 - 13.8			0.94 - 0.96	< 0.1		< 1	335 - 355	<5					●			
Synative® ES 818N	C8 to C18 glycerine ester	16.2 - 20.2	3.8 - 4.8		0.92 - 0.96	< 0.1		< 3	304 - 314	< 3					●			
Synative® ES 932T	TMP ester of monomer acid	91.0	12.9	140	0.916 <sup>[4]</sup>	1.2				12		270	0		●			●
Synative® ES 1200	Complex ester	1000 - 1300	95 - 105	177	0.94 - 0.97	< 1				< 15			-28		●	●		●
Synative® ES 2344	Tetraethylene glycol bis 2-ethylhexanoate	10.4	2.8	119	0.984 <sup>[4]</sup>	< 2.5				< 15		212	-66				●	
Synative® ES 2873	PE ester of dimer acid	2030	180	190	0.977 <sup>[4]</sup>	1.50				93		293	-9					●
Synative® ES 2902	Complex ester	500	55	176	0.963 <sup>[4]</sup>	4.0				12.0		302	-36					●
Synative® ES 2905	Complex ester	150	19.5	149	0.910 <sup>[4]</sup>	1.5				4.5		302	-51				●	●
Synative® ES 2908	Complex ester	430	49	175	1.070 <sup>[4]</sup>	4				100		280	-15					●
Synative® ES 2917	NPG ester of fatty acids	8.4	2.5	127	0.9160	0.03				1.5		210	-36	31	●	●		
Synative® ES 2918	PE ester of fatty acids	32.2	6.2	145	0.965 <sup>[4]</sup>	0.03				2		288	-18		●	●		●
Synative® ES 2920	TMP ester of fatty acids	17.3	4.0	132	0.951 <sup>[4]</sup>	0.02				2.0		258	-60		●	●	●	
Synative® ES 2925	TMP ester of fatty acids	19.8	4.4	136	0.946 <sup>[4]</sup>	0.02				2.0		258	-57	3.5	●	●	●	●
Synative® ES 2929	PE ester of fatty acids	26.5	5	115	0.993 <sup>[4]</sup>	0.02				1.5		258	-63			●	●	
Synative® ES 2931	PE ester of fatty acids	25.6	5.2	138	1.004 <sup>[4]</sup>	0.02				2.0		258	-63	5.0	●	●	●	●
Synative® ES 2934	TMP ester of fatty acids	21.2	4.7	146	0.946 <sup>[4]</sup>	0.02				2.0		258	-57	3.0	●	●	●	●
Synative® ES 2939	PE ester of fatty acids	25.4	5.0	125	0.993 <sup>[4]</sup>	0.02				1.5		258	-63	4.2	●	●	●	●
Synative® ES 2962	Complex ester	143	21.6	178	0.930 <sup>[4]</sup>	0.7				8.0		320	-30		●			●
Synative® ES 2964	TMP Trioleate	9.6	47.5	192	0.921 <sup>[4]</sup>	1.5				6.5		314	-45	2.1	●			●

<sup>[1]</sup> Measured at 100°F<sup>[2]</sup> Measured at 60°F<sup>[3]</sup> Measured at 210°F<sup>[4]</sup> Measured at 15.6°C (60°F)

● = Biodegradable (&gt; 60%)

● = Inherently Biodegradable

\* Values given in this table represent only typical characteristics. Detailed product specifications are given in the relevant product data sheets or MSDS

ESTERS																		
Product Name	Description	Kinematic Viscosity		Viscosity Index	Density	Acid Value		Iodine Value	Saponification Value	Hydroxyl Value	Cloud Point	Flash Point	Pour Point	NOACK	Biodegradable	Thermal & Oxidative Stability	Superior Low Temperature Performance	Low Volatility
		mm <sup>2</sup> /s (40°C)	mm <sup>2</sup> /s (100°C)		g/cm <sup>3</sup> 20°C	mg KOH/g		g I/100g	mg KOH/g	mg KOH/g	°C	°C	°C	% Weight loss				
		ASTM D 445/ DIN 51562		D-2270/ DIN ISO 2909	DIN 51757	ASTM D-974/ DGF C-V 2		DGF C-V 11b	DIN 53401	AOCS Cd 13-60	ISO 3015	ASTM D-92/ DIN EN ISO 2592	ASTM D-97/ DIN ISO 3016	DIN 51581/ CEC L 40 T 87				
<b>Complex/Polyol Esters (continued)</b>																		
Synative® ES 3157	Complex ester	46	8	140		< 0.5		< 1	335 - 345	< 10	-25	> 260	-50		●			
Synative® ES 3237	Complex ester	445	36	> 110	0.9689	< 0.5		< 13	270 - 305	13	-	> 300	-30		●			
Synative® ES 3345	Complex ester	112	14.4	155	0.9903	< 0.5		< 1	360 - 380	< 12	-25	300	-49		●		●	
Synative® ES PEC 4	TMP ester of fatty acids	30	6.3	186	0.9563	< 0.3		< 1	323 - 338	< 4	-13	> 270	-8		●			
Synative® ES TMP 05	NPG ester of fatty acids	46	9.5	180	0.9158	< 1		83 - 90	178 - 187	< 20	-25	340	-49		●			
Synative® ES TMP 05 H	Polyol ester	46	9.4	191	0.9152	< 0.2		82 - 92	178 - 188	< 5	-25	350	-48		●			
Synative® ES TMP 05/68	Trimethylolpropane complex ester	71	13	184	0.9184	< 2		72 - 92	177 - 189	< 15	-26	> 300	-42		●			
Synative® ES TMP 05/140	Trimethylolpropane complex ester	138	22	186	0.9252	< 1		84 - 92	178 - 188	88	-30	350	-32		●			
Synative® ES TMP 05/320	Trimethylolpropane complex ester	326	42	176	0.9319	< 1		85 - 95	178 - 188	< 15	-39	> 300	-40		●			●
Synative® ES TMP 05/1000	Trimethylolpropane complex ester	1000	105	201	0.9390	< 1		85 - 95	170 - 190		-30	> 300	-54		●			●
Synative® ES TMTC	Polyol ester	19	4.3	143	0.9435	< 0.2		< 1	309 - 329	< 1	-47	> 240	-69		●		●	
Synative® ES GTO	Glycerol trioleate	38	9	~ 190	0.9159	< 1		86 - 95	185 - 200	< 25	-18	> 200	-24		●			●
<b>Methyl Esters</b>																		
Synative® ES 2301	Methyl oleate	4.5	1.7	233	0.879	1.6				0.5		176	-12		●			
Synative® ES 932M	Methyl ester of monomer acid	6.1	2.1	156	0.874	1.6				0.5		185	6		●			
Synative® ES 8309	Methyl Ester of fatty acids				0.86 - 0.87	< 0.5		< 0.5	250 - 260			170			●			
Synative® ES ME TI 05	Methyl oleate	4	1.7			< 1		86 - 95	190 - 197			> 190			●			
Synative® ES ME V	Methyl oleate (veg source)					< 1		55 - 70	190 - 200			160			●			
Synative® ES ME V 05	Methyl oleate					< 1		80 - 97	187 - 197			160			●			
Synative® ES ME C12/98-100	Methyl ester of saturated fatty acid					< 0.5		< 0.5	260 - 263						●			
Synative® ES ME PK 12-18	Methyl ester of fatty acids					< 1		10 - 15	235 - 245						●			

<sup>[1]</sup> Measured at 100°F<sup>[2]</sup> Measured at 60°F<sup>[3]</sup> Measured at 210°F<sup>[4]</sup> Measured at 15.6°C (60°F)

● = Biodegradable (&gt; 60%)

● = Inherently Biodegradable

ESTERS																		
Product Name	Description	Kinematic Viscosity		Viscosity Index	Density	Acid Value		Iodine Value	Saponification Value	Hydroxyl Value	Cloud Point	Flash Point	Pour Point	NOACK	Biodegradable	Thermal & Oxidative Stability	Superior Low Temperature Performance	Low Volatility
		mm <sup>2</sup> /s (40° C)	mm <sup>2</sup> /s (100° C)		g/cm <sup>3</sup> 20° C	mg KOH/g		g I/100g	mg KOH/g	mg KOH/g	°C	°C	°C	% Weight loss				
		ASTM D 445/ DIN 51562		D-2270/ DIN ISO 2909	DIN 51757	ASTM D-974/ DGF C-V 2		DGF C-V 11b	DIN 53401	AOCS Cd 13-60	ISO 3015	ASTM D-92/ DIN EN ISO 2592	ASTM D-97/ DIN ISO 3016	DIN 51581/ CEC L 40 T 87				
<b>Mono Esters</b>																		
Synative® ES 9846	2-Ethylhexyl oleate	8	2.8	238	0.870 <sup>[4]</sup>	1			1			220	-39					
Synative® ES 2911	Isodecyl pelargonate	5	1.7	145	0.867 <sup>[4]</sup>	0.05			1.0			172	-75	99	●	●	●	
Synative® ES EHK	2-Ethylhexyl cocoate	6	1.8	56		< 0.3		< 5	174 - 184	< 0.6	-34	> 170	-33		●			
Synative® ES EHO	2-Ethylhexyl oleate	8	2.8	238		< 0.5		63 - 71	140 - 150	< 0.8	-33	> 180	-36		●			
Synative® ES EHO V	2-Ethylhexyl oleate (from veg oleic acid)	8	2.7	186	0.865	< 0.5		62 - 70	140 - 150	< 0.8	-16	212	-33		●			
Synative® ES EHPA	2-Ethylhexyl palmitate	9	2.5	165		< 0.5		< 2.0	148 - 158	< 0.5	-2	> 200	-3		●			
Synative® ES EHTI	2-Ethylhexyl tallowate	8	2.8	230		< 0.5		35 - 47	140 - 150	< 3	-8	> 210	-9		●			
Synative® ES ITS	Isotridecyl stearate	16	4.2	150	0.856 - 0.863	< 0.5		< 2	122 - 132	< 5	5	210	3		●			
<b>Diesters</b>																		
Synative® ES 2900	2-Ethylhexyl ester of dimer acid	83	13.2	161	0.901 <sup>[4]</sup>	1.5			2.0			300	-48	0.9			●	●
Synative® ES 2958	Di-2-ethylhexyl azelate	10.3	2.9	138	0.920 <sup>[4]</sup>	0.02			2.0			220	-72	22	●	●	●	
Synative® ES 2960	Di-isodecyl azelate	17.5	4.3	162	0.914 <sup>[4]</sup>	0.02			2.0			234	-72	8	●	●	●	
Synative® ES 2970	Di-isodecyl adipate (DIDA)	13.7	3.5	144	0.909 <sup>[4]</sup>	0.02			2.0			224	-72	13	●	●	●	
Synative® ES 2971	Di-iso tridecyl adipate (DITA/DTDA)	26.7	5.3	135	0.909 <sup>[4]</sup>	0.02			2.0			236	-57	7	●	●	●	
Synative® ES 2976	Di-iso octyl adipate (DIOA)	9.1	2.7	145	0.930	< 0.05		0.02		1.0		222	-72	34		●	●	
Synative® ES DEHS	Di-(2-ethylhexyl) sebacate	12	3.4	150	0.912 - 0.916	< 0.1		< 0.3	255 - 273	< 2.0	< -30	> 200	< -60		●	●	●	
Synative® ES DITA	Di-(isotridecyl) adipate (DITA /DTDA)	26	5.2	136	0.909 - 0.913	< 0.1		< 1	215 - 230	< 5		> 210	< -54	16	●	●	●	
Synative® ES DNA	Di-isononyl adipate	11	3	150	0.922	< 0.07					-54	220	-52	16	●	●	●	
Synative® ES DPHA	Di-(2-propylheptyl) adipate	11.5	3	114	0.9154 <sup>[4]</sup>	0.1		0.03	265	< 1	-42	223	-75	28		●	●	
Synative® ES DEHA	Di-(2-ethylhexyl) adipate	8	2	115	0.924 - 0.926	< 0.07					-44	196	-81		●	●	●	

<sup>[1]</sup> Measured at 100°F<sup>[2]</sup> Measured at 60°F<sup>[3]</sup> Measured at 210°F<sup>[4]</sup> Measured at 15.6°C (60°F)

● = Biodegradable (&gt; 60%)

● = Inherently Biodegradable

POLYALKYLENE GLYCOLS (PAGS)										
Product Name		Kinematic Viscosity		Viscosity Index	Density	Refractive Index		Cloud Point	Flash Point	Pour Point
		mm <sup>2</sup> /s (40° C)	mm <sup>2</sup> /s (100° C)		g/cm <sup>3</sup> 20° C	20° C		°C	°C	°C
		ASTM D 445/ DIN 51562		D-2270/ DIN ISO 2909	DIN 51757	DIN 51423 B2-75		DIN EN 1890 (Method A, 1% in H <sub>2</sub> O)	ASTM D-92/ DIN EN ISO 2592	ASTM D-97/ DIN ISO 3016
<b>Water Soluble PAGs</b>										
Breox® 50 A 20	EO/PO random co-polymer	19	4.6	168	1.016	1.4498		> 90	183	-58
Breox® 50 A 50	EO/PO random co-polymer	52	11	210	1.033	1.4534		66	220	-53
Breox® 50 A 140	EO/PO random co-polymer	133	26	232	1.051	1.4586		57	240	-48
Breox® 45 A 380	EO/PO random co-polymer	380	70	261	1.056	1.4591		50	216	-37
Breox® 43 A 1000	EO/PO random co-polymer	1050	167	280	1.060	1.4602		48	240	-36
Breox® 50 A 1000	EO/PO random co-polymer	1000	163	281	1.060	1.4620		51	230	-36
Breox® 60 W 1000	EO/PO random co-polymer	1000	161	279	1.073	1.4616		72	250	-26
Breox® 75 W 270	EO/PO random co-polymer	272	41	207	1.096	1.4640		>90	250	-1
Plurasafe® WS 330 B	EO/PO random co-polymer	60	12	209	1.0314	1.4550		65	238	-49
Plurasafe® WS 600 B	EO/PO random co-polymer	94	19	224	1.0403	1.4565		60	240	-45
Plurasafe® WS 660	EO/PO random co-polymer	130	26	233	1.0462	1.4585		55	257	-45
Plurasafe® WS 1147 D	EO/PO random co-polymer	214	38	230	1.0668				252	-35
Plurasafe® WS D 60-460	EO/PO random co-polymer	445	77	254	1.074				247	-37
<b>Water Insoluble PAGs</b>										
Breox® B 35	PO homo-polymer	33	7	166	0.983	1.4451		-	208	-57
Breox® B 75	PO homo-polymer	76	14	190	0.994	1.4477		-	211	-52
Breox® B 125	PO homo-polymer	122	21	202	0.996	1.4489		-	215	-42
Breox® B 225	PO homo-polymer	224	37	214	1.002	1.4520		-	219	-37
Breox® B 335	PO homo-polymer	330	52	222	1.002	1.4520		-	225	-32
Breox® IL 1007	PO homo-polymer	641	99	249	0.997	1.4521		-	234	-32
Plurasafe® WI 135	PO homo-polymer	24	5	170	0.977			-	210	-54

<sup>[1]</sup> Measured at 100°F<sup>[2]</sup> Measured at 60°F<sup>[3]</sup> Measured at 210°F<sup>[4]</sup> Measured at 15.6°C (60°F)

POLYALKYLENE GLYCOLS (PAGS)										
Product Name		Kinematic Viscosity		Viscosity Index	Density	Refractive Index		Cloud Point	Flash Point	Pour Point
		mm <sup>2</sup> /s (40° C)	mm <sup>2</sup> /s (100° C)		g/cm <sup>3</sup> 20° C	20° C		°C	°C	°C
		ASTM D 445/ DIN 51562		D-2270/ DIN ISO 2909	DIN 51757	DIN 51423 B2-75		DIN EN 1890 (Method A, 1% in H <sub>2</sub> O)	ASTM D-92/ DIN EN ISO 2592	ASTM D-97/ DIN ISO 3016
<b>Water Insoluble PAGs (continued)</b>										
Plurasafe® WI 165	PO homo-polymer	34	7	177	0.9806	1.4460		-	218	-51
Plurasafe® WI 250	PO homo-polymer	49	9	176	0.9864	1.4565		-	223	-51
Plurasafe® WI 285	PO homo-polymer	55	10	182	0.9883	1.4480		-	232	-45
Plurasafe® WI 385	PO homo-polymer	76	14	194	0.9892			-	231	-48
Plurasafe® WI 600 D	PO homo-polymer	102	16	176	1.0042	1.448		-	229	-33
Plurasafe® WI 625	PO homo-polymer	126	22	204	0.9946	1.4499		-	232	-42
Plurasafe® WI 700 D	PO homo-polymer	147	23	188	1.0026	1.4509		-	227	-45
<b>High Viscosity PAGs</b>										
Breox® 75 W 18000	EO/PO random co-polymer	18000	2540	414	1.095	1.4661		> 90	245	6
Breox® 75 W 55000	EO/PO random co-polymer	55000	7900	430	1.095	1.4658		> 90	240	6
Breox® 75 W 2050	EO/PO random co-polymer	2025	300	303	1.097	1.4649		> 90	252	6
Breox® TB 110	75% Breox 75W55000 + 25% water	11460	-	-	1.0971	1.4231		75		
Breox® TB 120	60% Breox 75W55000 + 40% water	2600	-	-	1.093	1.4249		78		-31
Breox® TB 150	70% Breox 75W18000 + 30% water	2850	-	-	1.087	1.4374		76		-27
Breox® TB 170	70% Breox 75W30000 + 30% water	3800	-	-	1.000					
Breox® TB 195	60% Breox 75W18000 + 40% water	850	-	-	1.090	1.4237		77		-33
Pluracol® V10	EO/PO random co-polymer	65835	9180	504	1.0904	1.4663			271	-3
Pluracol® V 1075	75% Pluracol V10 + 25% water	11015	1600	405	1.1000	1.4409			263	-12
Pluracol® WS 5100	EO/PO random co-polymer	965	165	274	1.0579	1.4614			260	-33
Pluracol® WT 90000	EO/PO random co-polymer	27600	4140	468	1.0931	1.4671		79	271	6
<b>Fire Resistant (HFC) Hydraulic fluid</b>										
Breox® NF46 4005	Fire resistant hydraulic fluid (HFC)	1330	-		1.080					-37

<sup>[1]</sup> Measured at 100°F<sup>[2]</sup> Measured at 60°F<sup>[3]</sup> Measured at 210°F<sup>[4]</sup> Measured at 15.6°C (60°F)



## EMULSIFIERS

Product Name	Description	Appearance / Form	HLB	Viscosity	pH		Density	Hydroxyl Value	Cloud Point Index	Cloud Point		Pour Point	Flash Point	Iodine Value	Surface Tension
							g/cm <sup>3</sup> 20° C	mg KOH/g	ml	°C	°C	°C	°C	g I/100 g	mN/m
							DIN 51757	AOCS Cd 13-60 DIN 53240	ISO 4320	DIN EN 1890 (method A, D or E)	ISO 3015	ASTM D-97/ DIN ISO 3016	ASTM D-92/ DIN EN ISO 2592	DGF C-V 11b	EN 14370 1g/l Surfactant in Dist H <sub>2</sub> O, 23° C
<b>Alkoxylates</b>															
Synative® AC B33 V	Saturated and unsaturated fatty acid ethoxylate	Clear Light yellow liquid		27	Acid < 0.3 mgKOH/g		0.9015				-21	-24	208	< 5	
Synative® AC 2142	Castor oil ethoxylate	Clear yellow Liquid	8	163	6.0-7.5		0.9641	150 - 155		44 - 48 (E)	-3	0	162	27 - 32	
Synative® AC 3370 V	Fatty alcohol ethoxylate (veg based)	Clear Yellow Liquid	5	37	6.0 - 7.5		0.8946	157 - 167	20 - 22	-	15	15	202		
Synative® AC 3412 V	Fatty alcohol ethoxylate (veg based)	Clear to Cloudy yellow Liquid	5.5	14 (50° C)	6.0 - 7.5		0.8720	155 - 165		37 - 42 (E)	22	24	198		
Synative® AC 3499	Fatty acid monoethanolamide derivative, free from secondary amines	Clear light brown liquid	3.7	308	9.7 - 10.7		0.9605	142 - 172	21 - 30	-	-11	-15	246	27 - 37	
Synative® AC 3830	Fatty alcohol ethoxylate (veg based)	Clear Yellow Liquid	6.6	41	5 - 7.5		0.9164	148	25 - 30	-	-7	-6	212	60 - 66	
Synative® AC 5102	Fatty alcohol ethoxylate (veg based)	Clear to Cloudy yellow Liquid	5.5	13 (50° C)	6.0 - 7.5		0.869	155 - 165		37 - 42 (E)		24			
Synative® AC EP 5 LV	Fatty alcohol ethoxylate (veg based)	Clear Yellow Liquid	8.5	62	6.0 - 7.5		0.9478	116 - 123		65 - 68 [6]	< 15	6	232		
Synative® AC ET 5 V	Fatty alcohol ethoxylate (veg based)	Yellow cloudy liquid	9.1	67			0.9518	115 - 125		69 - 72.5 [12]		17	220		
Synative® AC K 100	Cocoamine ethoxylate	Yellow to brown Liquid	14.2	187			1.0275			93 - 97 [12, NaCl]	-25	-30	>250		38
Synative® AC LS 4 L	Lauric alcohol ethoxylate	Clear Liquid at RT	9.4		6-7.5 [1]			150-160		68-70 (D)					
Synative® AC LS 24	Fatty alcohol ethoxylate (veg based)	Colourless to slightly yellow liquid	10.3		6.5 - 7.5 [2]		0.9043 [3]	110 - 120	17.8	-					
Synative® AC LS 54	Fatty alcohol ethoxylate (veg based)	Colourless to slightly yellow liquid	14.7		6.5 - 7.5 [2]		0.930 - 0.9380 [3]	87 - 99							
Synative® AC OCP 502	Tallow alcohol propoxylate	Light Yellow clear to cloudy liquid	3.3		6 - 7.5			146 - 154		46 - 49 (A)					
Synative® AC RT 5	Castor oil ethoxylate	colourless liquid	4	936	6.5 - 7.5		0.9864	142	1.8-2.5	-	-65	-39	266	65 - 75	
Synative® AC RT 40	Castor oil ethoxylate	Liquid	13	1329	7		1.0295 [3]			79 (E)	11	9			41
Synative® AC PWM 2	Fatty alcohol ethoxylate	Pasty Liquid	5.5		5 - 8		0.861 - 0.865 [3]	155 - 165		49 - 53 [6]				36 - 42	
Synative® X AO 3	Guerbet alcohol ethoxylate	Clear/slightly cloudy Liquid, may have sediments	8	38	7		0.9207	165		45 (E)	-3	-3	130 [7]		28
Synative® X LF 403	Guerbet alcohol ethoxylate	Clear/slightly cloudy Liquid		60	7		0.9481			41 (E)	-31	-30			30
Synative® XA 40	Oxo alcohol ethoxylate	Cloudy Liquid, may have sediment	10.5	29	7		0.9519	150		43 (E)	-38	-48	> 170 [7]		27

[1] PH 5% Aq. Solution

[2] PH 1% solution in Aq. 3% NaCl

[3] Measured at 70° C

[4] Measured at 23° C

[5] ISO 3681 used

[6] DIN EN 1890 (1% in H<sub>2</sub>O)

[7] Flash Point by DIN 51376

[8] Flash Point by ISO 2592

[9] Viscosity by DIN 51562 mm<sup>2</sup>/s @ 20° C[10] Viscosity by DIN 51562 mm<sup>2</sup>/s @ 50° C

[11] pH measured with 2.5% Aqueous solution

[12] cloud point by DIN 53917

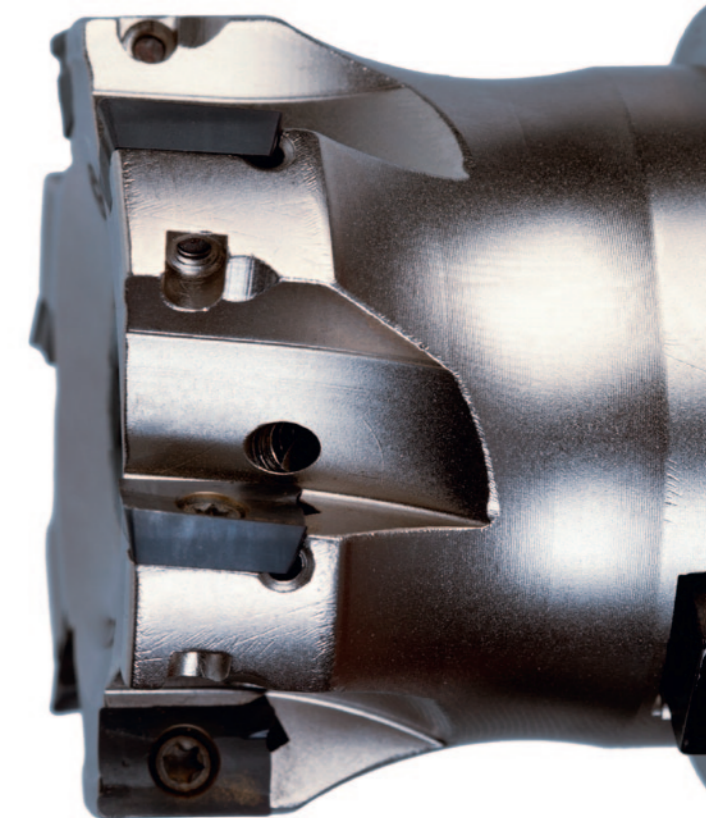
## EMULSIFIERS

Product Name	Description	Appearance / Form	HLB	Viscosity	pH	Density	Hydroxyl Value	Cloud Point Index	Cloud Point		Pour Point	Flash Point	Iodine Value	Surface Tension
									°C	°C				
									g/cm <sup>3</sup> 20°C	mg KOH/g				
				EN 12092 Brookfield 60 rpm 20°C mPa.s	DIN EN 1262, Solution B	DIN 51757	AOCS Cd 13-60 DIN 53240	ISO 4320	DIN EN 1890 (method A, D or E)	ISO 3015	ASTM D-97/ DIN ISO 3016	ASTM D-92/ DIN EN ISO 2592	DGF C-V 11b	EN 14370 1g/l Surfactant in Dist H <sub>2</sub> O, 23°C
<b>Alkoxylates (continued)</b>														
Synative® XA 60	Mixture of branched and linear alcohol propoxylates	Cloudy Liquid, may have sediment	12.5	60	7	0.98	115		65 (E)	< 5		> 200 <sup>[8]</sup>		27
Synative® X 700	Guerbet alcohol ethoxylate	Cloudy Liquids	10.5	41	7	0.9604	150		46 (E)	-31	-39	> 140 <sup>[8]</sup>		26
Synative® X 710	Guerbet alcohol ethoxylate	Cloudy Liquids	12.5	80	7	0.99	100		68 (E)			> 180 <sup>[8]</sup>		27
Synative® X 720	Guerbet alcohol ethoxylate	Cloudy Liquid, may have sediment	14	400	7	1.02	90		69 (A)	69		> 180 <sup>[8]</sup>		27
Synative® X 730	Guerbet alcohol ethoxylate	Colourless/ slightly yellow paste	15	30 (@ 60°C)	7	0.99 @70°C	75		80 (A)	Solid at RT	-	> 190 <sup>[8]</sup>		28
<b>EO/PO Block Co-Polymers</b>														
Breox® E 200	Polyethylene glycol	Liquid	-	60 <sup>[9]</sup>	7	1.12	563			-75	-54	> 170 <sup>[8]</sup>		71
Breox® E 400	Polyethylene glycol	Liquid	-	110 <sup>[9]</sup>	7	1.13	281			7	3	> 250 <sup>[8]</sup>		70
Breox® E 600	Polyethylene glycol	Liquid/Solid	-	40 @ 50°C <sup>[10]</sup>	7	1.14	187			20	18	> 250 <sup>[8]</sup>		68
Synative® 17R2	EO/PO block co-polymer	Liquid	6	450	5.5 - 6.7 <sup>[11]</sup>	1.02	50		37		-25			42
Synative® 17R4	EO/PO block co-polymer	Liquid	12	600	5.5 - 6.7 <sup>[11]</sup>	1.03	40		46		18			44
Synative® PE 6100	OH-EO-PO-EO-OH block copolymer	Liquid		350	7	1.02	56		23 (A)	-67	-39	226		40
Synative® PE 6400	OH-EO-PO-EO-OH block copolymer	Liquid		1000	7	1.05	40		60 (A)	15	12			41
Synative® PE 6800	OH-EO-PO-EO-OH block copolymer	Powder M.Pt (48°C)		-	7	1.06 (@ 70°C)	15		95 (E)					51
Synative® PE 10100	OH-EO-PO-EO-OH block copolymer	Liquid		800	7	1.02	34		17 (A)	-63	-36			36
Synative® RPE 1720	OH-PO-EO-PO-OH block copolymer	Liquid	6	450	7	1.02	50		37 (A)	-63	-39			38
Synative® RPE 1740	OH-PO-EO-PO-OH block copolymer	Liquid	12	600	7	1.03	50		50 (A)	4	0			41
Synative® RPE 2520	OH-PO-EO-PO-OH block copolymer	Liquid		600	7	1.02			28 (A)	28				40
Synative® X 300	EO/PO block co-polymer	Liquid	14	660 (25°C)	5.0 - 7.5 <sup>[11]</sup>	1.04 (25°C)	35		32	32	-5			41
Synative® X310	EO/PO block co-polymer	Liquid	6	700 (25°C)	5.0 - 7.5 <sup>[11]</sup>	1.03 (25°C)	30		26	26	7			36
Synative® X320	EO/PO block co-polymer	Paste	8	350 (60°C)	6.0 - 7.4 <sup>[11]</sup>	1.01 (60°C)	20		90	90	31			34

<sup>[1]</sup> PH 5% Aq. Solution<sup>[2]</sup> PH 1% solution in Aq. 3% NaCl<sup>[3]</sup> Measured at 70°C<sup>[4]</sup> Measured at 23°C<sup>[5]</sup> ISO 3681 used<sup>[6]</sup> DIN EN 1890 (1% in H<sub>2</sub>O)<sup>[7]</sup> Flash Point by DIN 51376<sup>[8]</sup> Flash Point by ISO 2592<sup>[9]</sup> Viscosity by DIN 51562 mm<sup>2</sup>/s @ 20°C<sup>[10]</sup> Viscosity by DIN 51562 mm<sup>2</sup>/s @ 50°C<sup>[11]</sup> pH measured with 2.5% Aqueous solution<sup>[12]</sup> cloud point by DIN 53917

## COUPLING AGENTS/SOLUBILISERS

Product Name	Description	Kinematic Viscosity		Acid Value		Iodine Value	Saponification Value	Hydroxyl Value	Cloud Point	Flash Point	Pour Point	Solidification Point
		mm <sup>2</sup> /s (40° C)	mm <sup>2</sup> /s (100° C)	mg KOH/g		g l/100g	mg KOH/g	mg KOH/g	°C	°C	°C	°C
		ASTM D 445/ DIN 51562 (I)		ASTM D-974/ DGF C-V 2		DGF C-V 11b	DIN 53401	AOCS Cd 13-60	ISO 3015	ASTM D-92/ DIN EN ISO 2592	ASTM D-97/ DIN ISO 3016	DIN ISO 3841
<b>Fatty Alcohols</b>												
Synative® AL 50/55 V	Oleyl/Cetyl alcohol based on vegetable raw materials			< 0.2		50 - 55	< 1.0	215	< 12			29 - 37
Synative® AL 80/85 V	Oleyl/Cetyl alcohol based on vegetable raw materials	-	-	< 0.2		85 - 90	< 1.0	210	-	~ 180	-	6 - 16
Synative® AL 90/95 V	Oleyl/Cetyl alcohol based on vegetable raw materials	19	-	< 0.2		90 - 98	< 1.0	210	< 12	~ 190	-	2 - 12
Synative® AL C12/98-100	Lauryl alcohol	12	2.30	< 0.1		< 0.2	< 0.4	298 - 302	22	136	21	20 - 24
Synative® AI C12-C14 50/50	Saturated C12-14 fatty alcohols			< 0.1		< 0.3	< 0.5	275 - 285				17 - 23
Synative® AL G 16	Guerbet alcohol	-	-	< 0.5		< 10	< 6	212	-20	160	-75	
Synative® AL G 20	Guerbet alcohol	26	-	< 0.10		< 8.0	< 3	182	< -20	~ 180	< -25	
Synative® AL S	Fatty alcohol C12 to C14	13	2.5	< 0.1		< 0.3	< 0.5	289	-	~ 140	-	
Synative® AL T	Fatty alcohol C12 to C18	-	-	< 0.1		< 0.5	< 1.2	272	-	~ 130	-	

<sup>[1]</sup> PH 5% Aq. Solution<sup>[2]</sup> PH 1% solution in Aq. 3% NaCl<sup>[3]</sup> Measured at 70° C<sup>[4]</sup> Measured at 23° C<sup>[5]</sup> ISO 3681 used<sup>[6]</sup> DIN EN 1890 (1% in H<sub>2</sub>O)<sup>[7]</sup> Flash Point by DIN 51376<sup>[8]</sup> Flash Point by ISO 2592<sup>[9]</sup> Viscosity by DIN 51562 mm<sup>2</sup>/s @ 20° C<sup>[10]</sup> Viscosity by DIN 51562 mm<sup>2</sup>/s @ 50° C<sup>[11]</sup> pH measured with 2.5% Aqueous solution<sup>[12]</sup> cloud point by DIN 53917

## CORROSION INHIBITORS

Product Name	Description	Appearance	pH	Density	Viscosity	Acid Number	Iodine Value	Saponification Value	Hydroxyl Value	Cloud Point Index	Cloud Point	Flash Point	Pour Point	HLB
				g/cm <sup>3</sup> , 20° C	mm <sup>2</sup> /s 20° C	mg KOH/g	g I/100 g	mg KOH/g	mg KOH/g	ml	°C	°C	°C	
			DIN EN 1262, 1%in water	DIN 51757	DIN 51562, ASTM D445	DIN ISO 2114	DGF C-V 11b	DIN 53401/ISO 3681	AOCS Cd 13-60	ISO 4320	ISO 3015/DIN EN 1890 (1% in H <sub>2</sub> O)	ISO 2592	ASTM D-97/DIN ISO 3016	
Synative® AC 3499	Fatty acid monoethano-lamide derivative, free from secondary amines	Clear light brown liquid	9.7 - 10.7	0.96	250-300	-	27 - 37	65 - 75	142 -172	21 - 30	< -2		< -5	3,7
Synative® CI 500	Alkyl phosphate ester	Clear yellow Liquid	~ 2	1.06	350	430	-							
Synative® CI 510	Polyether phosphate ester	Clear Brown Liquid	~ 1.5	1.06	2000 ( 50° C)	130	-					178	-16	

## CORROSION INHIBITORS

Product Name	Description	Appearance	Active Content	Moisture Content	Density	Solubility in Water		Solubility in mineral oil
			(%)	(%)	g/cm <sup>3</sup> , 25° C	pH 7	pH > 8 <sup>[1]</sup>	
					ASTM D 2638	%	%	%
Irgacor® L 190 PLUS	Organic Polycarboxylic acid	White free flowing powder	65	35	1.1	< 0.01	>5 <sup>[1]</sup>	< 0.01

## FOAM CONTROL AGENTS

Product Name	Description	Kinematic Viscosity		Acid Value	Density	Cloud Point	Flash Point	Pour Point
		mm <sup>2</sup> /s ( 40° C)	mm <sup>2</sup> /s ( 100° C)	mg KOH/g	g/cm <sup>3</sup> 20° C	°C	°C	°C
		ASTM D 445/DIN 51562 (I)		DGF C-V 11b	DIN 51757	ISO 3015/DIN EN 1890 (1% in H <sub>2</sub> O)	ISO 2592	ASTM D-97/DIN ISO 3016
Breox® FCC P12	100% Active polyalkylene glycol non-ionic surfactant	170	-	-	1.011	12	> 230	-14
Synative® AC AMH 2	100% Active polyalkylene glycol non-ionic surfactant			<5	0.825		70	

<sup>[1]</sup> PH 5% Aq. Solution<sup>[2]</sup> PH 1% solution in Aq. 3% NaCl<sup>[3]</sup> Measured at 70° C<sup>[4]</sup> Measured at 23° C<sup>[5]</sup> ISO 3681 used<sup>[6]</sup> DIN EN 1890 (1% in H<sub>2</sub>O)<sup>[7]</sup> Flash Point by DIN 51376<sup>[8]</sup> Flash Point by ISO 2592<sup>[9]</sup> Viscosity by DIN 51562 mm<sup>2</sup>/s @ 20° C<sup>[10]</sup> Viscosity by DIN 51562 mm<sup>2</sup>/s @ 50° C<sup>[11]</sup> pH measured with 2.5% Aqueous solution<sup>[12]</sup> cloud point by DIN 53917



# Our Global Production and Technology Footprint

Global Support for Our Customers



## Base Stocks for Lubricants and Components for Metalworking Fluids

### Production plant

- ① Ludwigshafen, Germany
- ② Düsseldorf, Germany
- ③ Antwerp, Belgium
- ④ Barcelona, Spain
- ⑥ Washington, USA
- ⑦ Cincinnati, USA
- ⑧ Geismar, USA
- ⑨ Jacarei, Brazil
- ⑩ Shanghai, China
- ⑪ Nanjing, China

### Technology

- ① Ludwigshafen, Germany
- ⑦ Cincinnati, USA
- ⑤ Tarrytown, NJ, USA
- ⑨ Jacarei, Brazil
- ⑩ Shanghai, China
- ⑫ Mumbai, India



