

COMPREHENSIVE CATALOGUE

Oleo & Speciality Chemicals Division

Products Index

1. FATTY ACID.....	1~4
2. HARDENED OIL (Triglyceride)	5
3. HIGHER ALCOHOL.....	6
4. GLYCERIN.....	7~8
5. FATTY ACID AMIDE.....	9
6. METALLIC SOAP	
6-1. DIRECT METHOD.....	10
6-2. DOUBLE DECOMPOSITION METHOD.....	11~12
6-3. HYPERFINE PARTICLES TYPE.....	13
6-4. NEUTRAL TYPE.....	14
7. ESTERS	
7-1. ESTER.....	15
7-2. MEDIUM CHAIN FATTY ACID TRIGLYCERIDE	16
7-3. HIGH-PURIFIED SOLID TYPE ESTER.....	16
7-4. POLYOL ESTERS for LUBRICATING OIL.....	17
7-5. MONO ESTERS for LUBRICATING OIL.....	18
7-6. COMPLEX™ESTER.....	18
7-7. BIODEGRADABLE HYDRAULIC FLUIDS.....	18
8. AMINE.....	19~20
9. FATTY ACID CHLORIDE.....	21
10. MONOMERS and GLYCIDYL ETHERS.....	22~32
11. POLYMER with GLYCIDYL METHACRYLATE.....	33
12. FATTY ACID with GLYCIDYL.....	34
13. POLYMERIZATION MODIFIER.....	34
14. ANTIOXIDANT.....	34
15. SURFACTANTS	
15-1. ANIONIC SURFACTANT.....	35~38
15-2. CATIONIC SURFACTANT.....	39~40
15-3. NONIONIC SURFACTANT.....	41~50
15-4. AMPHOTERIC SURFACTANT.....	51
15-5. POLYMER SURFACTANT.....	52
16. POLYETHER.....	53~61
17. FOR CONSTRUCTION & BUILDING MATERIALS.....	62~63
18. DUST & COAL DUST CONTROL AGENT.....	64
19. DEFOAMING AGENT.....	65~66
20. ANTISTATIC AGENT.....	67~68

Trade Name Index

<u>1</u>			Behenyl methacrylate	23	DIAPON [®]	38
100 MARSEILLE	37	Betaine	51	Diglyceryl polyethylene glycol	56	
12-Hydroxystearic Acid	3	BISPHENOL A DERIVATIVES	58	DISFOAM [®]	65~66	
1214 Fatty Acid	1、2	BLEMMER [®]	22~30	DISPANOL [®]	42	
<u>2</u>			BLEMMER [®] TGL	34	Dodecylamine	19
2-Ethylhexyl glycidyl ether	31	(BOO)STEARIC ACID	1、2	Dodecyl dimethyl amine	20	
2-Ethylhexyl methacrylate	23	Butyl glycidyl ether	31	DODECYL MERCAPTAN	34	
<u>A</u>			BUTYL LAURATE	15	DUSSEAL [®]	64
ALFLOW [®]	9	BUTYL STEARATE	15	DYNAMITE GLYCERIN	7	
Alkanol amide	49	<u>C</u>			<u>E</u>	
Alkyl acrylate	24	CALCIUM CASTOR STEARATE	11	ELEGAN [®]	67~68	
Alkylbenzene Sulfonate	36	CALCIUM STEARATE	10、11	EPIOL [®]	31~32	
Alkyl ethersulfate	35	CAPRIC ACID	1、2	Epoxidized soybean oil	34	
Alkyl methacrylate	23	CAPROIC ACID	1、2	Erucamide	9	
Alkyl sulfate	35	CAPRYLIC ACID	1、2	ERUCIC ACID	4	
Allyl glycidyl ether	31	CASTER WAX	5	Ethoxysulfate	35	
Allyl polyethers	61	CATION [™]	39~40	Ethylene bis oleylamide	9	
ALUMINUM STEARATE	12	CATIONIC SURFACTANTS	39~40	Ethylene bis stearamide	9	
AMINE	19~20	Cetyl acrylate	24	EXTRA [™] OLEIN	4	
Amine Oxide	50	CETYL ALCOHOL	6	<u>F</u>		
AMPHOTERIC SURFACTANT	51	CETYL STEARYL ALCOHOL	6	FAK-2、FAK-4	3	
ANIONIC SURFACTANTS	35~38	Cetyl myristate	15	FARPACK [™]	68	
ANON [™]	51	CETYL STEARYL ALCOHOL	6	Fatty ACID	1~4	
ANTIOX [™]	34	Coco-alkylamine	19	FATTY ACID CHLORIDE	21	
ANTIOXIDANT	65	Coconut alkyl dimethyl amine	20	FATTY ACID (FOR SOAP)	3	
ANTISTATIC AGENTS	67~68	COCONUT FATTY ACID	1、2	FATTY ACID SOAP	37	
Asphalt Emulsions Agents	62	COMPLEX [™] ESTER	18	FATTY ACID FOR SOAP	3	
Asphalt Release Agents	63	CONCENTRATED GLYCERIN	8	FEED GRADE GLYCERIN	7	
ASPHASOL [®]	62~68	COSMETICS GRADE GLYCERIN	8	FIRET [®]	38	
AULABRITE [®]	11、14	Cyclohexyl acrylate	24	FOOD ADDITIVE GLYCERIN	7	
<u>B</u>			Cyclohexyl methacrylate	23	<u>G</u>	
BARIUM STEARATE	10、12	<u>D</u>			GLYCERIN	7~8
BEHENIC ACID	1、2	Decyl methacrylate	23	Glyceryl dimethacrylate	22	
Behenyl acrylate	24	Defoaming agent	62,65,66	Glyceryl monomethacrylate	22	
Behenylamine	19	DG	7	Glyceryl polyethylene glycol	54、55	
Behenyl behenate	15	Diamine	20	Glycidol	31	

Trade Name Index

GLYCIDYL ETHER	31、32	METHYL ERUCATE	15	Octyl stearate	15、18
Glycidyl methacrylate	22	METHYL LAURATE	15	OLEIC ACID	4
H					
Hardened oil	5	Methyl oleate	15、18	OLEOYL SARCOSINE	38
Hardened tallow alkylamine	19	METHYL PALMITATE	15	Oleylamide	9
Hardened tallow fattyacid	3	METHYL STEARATE	15	Oleylamine	19
Hexadecyl amine	19	Methylstyrene dimer	34	Oleyl chloride	21
Hexadecyl dimethyl amine	20	MONOGLY™	45	P	
HIGHR ALCOHL	6	Monoglyceride	45	PALMITIC ACID	1、2
HYDRAULIC FLUID	18	MYRISTIC ACID	1、2	PALMITOYL CHLORIDE	21
HYDROGENATED CASTOR OIL	5	MYRISTOYL CHLORIDE	21	PANACET®	16
HYDROGENATED CASTOR OIL		MYRISTYL ALCOHOL	6	PBG	56
-FATTY ACID	3	N			
I					
IPM™-R	15	NAA®	1~4、9	Pentaerythitol ester	15
IPP™-R	15	NAA®174 CHLORIDE	21	PERSOFT®	35
Isopalmitoyl chloride	21	N-DODECYL MERCAPTAN	34	PERSOFT®NK	41
Isopropyl myristate	15	NEWCIZER®	34	Phenyl glycidyl ether	31
Isopropyl palmitate	15	NEW ELEGAN®	68	PLONON®	57
Isostearoyl chloride	21	NEWREX®	36	Polybutylene glycol	56
L					
LAURIC ACID	1、2	NOFMER®	34	Polycarboxylic acid	52、65、66
Lauryl acrylate	24	NOMP™	34	POLYOL ESTER	17
LAURYL ALCOHL	9	Nonandiol dimethacrylate	22	POLYGERIN®	57
Lauryl methacrylate	23	NONION®	41~44	Polyethylene glycol	53
LAUROYL CHLORIDE	21	NONION®DS-60HN	45	Polyethyleneglycol acrylate	26
Lauroyl sarcosine	38	NONIONIC SURFACTANTS	41~50	Polyglycerin	46
LUBURICANT ESTER	17~18	NONSOUL™	37	Polyglycerin Alkyl Ester	46
M					
MAGNESIUM STEARATE	10、11	NISSAN AMINE®	19~20	Polyglycerin monoglyceride	45
MALIALIM®	52、62	NISSAN ANON®	51	Polymerization modifiers	34
MARPROOF®	33	NISSAN CATION®	39~40	Polymer surfactant	52
MARSEILLE SOAP	37	NYMEEN®	43	Polyoxyethylene alkyl amine	43
ME-175	15	O			
MEDIUM CHAIN FATTY ACID	16	Octadecylamine	19	Polypropylene glycol	53
METALLIC SOAP	10~14	Octadecylamine acetate	39	Polypropyleneglycol acrylate	26
		Octadecyl dimethyl amine	20	POLYSTER®	52
		Octyl 3-mercaptopropionate	34	Potassium salt of fatty acids	37
		Octyl oleate	15、18	POWDER BASE	11
		Octyl palmitate	15、18	PPG	56
				PRIMARY AMINES	19

Trade Name Index

R

RAPISOL [®]	36
RG	7
RG·CO·™	8

S

SINTREX	35
Soap base	3
Sodium Dialkyl Sulfosuccinate	36
Sodium lauroyl sarcosine	38
Sodium laurylamino diacetate	51
Sodium salt of fatty acids	37
Sorbitan Derivatives	47、48
Sorbitol polypropylene glycol	56
Soybean alkylamine	19
Spermaceti	15
STAFOAM [®]	49
Stearamide	9
STEARIC ACID	1、2
STEAROYL CHLORIDE	21
Stearyl acrylate	24
STEARYL ALCOHOL	6
Stearyl methacrylate	23
Stearyl stearate	15
SUNAMIDE [®]	38
Sunbase [®]	38
SYUDOX [®]	62

T

Tallow alkylamine	19
TALLOW FATTY ACID	3
TALLOW HARDENED OIL	5
Tertiary amine	20
Tetradecylamine	19
Tetradecylamine acetate	39
Tetradecyl dimethyl amine	20
Tetramethylene glycol derivatives	57
Thioglycerol	34

U

UNIGLY [®]	45、46
UNILUBE [®]	56~60
UNILUBE [®] PKA	61
UNIOL [®]	55、56、58
UNIOX [®] AA	61
UNIOX [®] G	54
UNIOX [®] HC	46
UNIOX [®] M	54
UNIOX [®] PKA	61
UNIOX [®] ST	48
UNISAFE™A	50
UNISAFE™AX-22	59
UNISAFE™NKL-9520	45
UNISAFE™PKA	61
UNISTER [®]	15~18
UNISTER [®] E-275	45

W

Water Reducing Agent	62
WE-476	15
WILSURF [®]	48

Z

ZINC BEHENATE	11
ZINC LAURATE	10、11
ZINC MYRISTEATE	11
ZINC STEARATE	10、11

1.FATTY ACID

1.1 SATURATED FATTY ACID (Typical Specifications)

Ingredient	Product Name	Appearance	Neutralization Value	Iodine Value	Melting Point (°C)	Color (APHA)			
CAPROIC ACID	NAA [®] -60	Liquid	425~483	7 ↓	—	—			
CAPRYLIC ACID	NAA [®] -82		382~390	0.5 ↓	* 15.5~16.5	120 ↓			
CAPRIC ACID	NAA [®] -102	Solid	323~327	0.5 ↓	* 29.5~31.5	120 ↓			
LAURIC ACID	NAA [®] -122	Beads	278~282	0.5 ↓	32~45	120 ↓			
	1214 Fatty Acid	Solid	269~273		* 32~39				
	NAA [®] -312	Solid	277~283	1.0 ↓	32~36	150 ↓			
	COCONUT FATTY ACID	(20°C)	260~270	10 ↓	23~28	300 ↓			
MYRISTIC ACID	NAA [®] -142	Beads	242~248	0.5 ↓	45~56	120 ↓			
PALMITIC ACID	NAA [®] -160	Beads	215~220	1 ↓	50~63	120 ↓			
	NAA [®] -171		209.5~215.5	2 ↓	52~57				
(SPECIAL) STEARIC ACID	NAA [®] -180	Beads	195~206	2 ↓	65~69	80 ↓			
	NAA [®] -173K					100 ↓			
	NAA [®] -175		204~210	0.5 ↓	52~58				
	NAA [®] -176		207~212		52~57				
STEARIC ACID	STEARIC ACID CHERRY	Beads	197~207	0.5 ↓	57.5 ↑	100 ↓			
		Powder							
		Fine Powder							
	STEARIC ACID CAMELLIA	Beads					4 ↓	53 ↑	6 ↓ (Gardner)
		Powder							
STEARIC ACID (BOO)	Stick	—	—	50 ↑	—				
BEHENIC ACID	NAA [®] -222S	Beads	161~169	3 ↓	69~80	120 ↓			
		Powder							

* Titer Test

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1.2 SATURATED FATTY ACID (Fatty Acid Composition)

Ingredient	Product Name	Typical Fatty Acid Composition (%)												
		Saturated Acid										Unsaturated		
		C6	C8	C10	C12	C14	C16	C18	C20	C22	C24	C18	C18	
CAPROIC ACID	NAA [®] -60	99	1											
CAPRYLIC ACID	NAA [®] -82	0.5	99	0.5										
CAPRIC ACID	NAA [®] -102		0.5	99	0.5									
LAURIC ACID	NAA [®] -122			0.5	99	0.5								
	1214 Fatty Acid			0.5	75	24.5								
	NAA [®] -312			10	75	15								
	COCONUT FATTY ACID		5	6	55	17	10	1				5	1	
MYRISTIC ACID	NAA [®] -142				0.5	99	0.5							
PALMITIC ACID	NAA [®] -160					1	96	3						
	NAA [®] -171					1	70	28				1		
(SPECIAL) STEARIC ACID	NAA [®] -180						2	97				1		
	NAA [®] -173K						6	93				1		
	NAA [®] -175					4	43	52	1					
	NAA [®] -176					3	50	47						
STEARIC ACID	STEARIC ACID CHERRY					2	31	66	1					
	STEARIC ACID CAMELLIA					3	32	63	1	1				
	STEARIC ACID (BOO)	φ 66mm×H208mm (25/Set)												
BEHENIC ACID	NAA [®] -222S						13		85	2				

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1.3 OTHER FATTY ACID (Typical Specifications)

Ingredient	Product Name	Appearance	Neutralization Value	Iodine Value	Melting Point(°C)	Hydroxyl Value	Color (APHA)
HARDENED TALLOW FATTY ACID	HARDENED TALLOW FATTY ACID 45° HFA	Solid	202~207	38~46	41~50	—	120 ↓
	HARDENED TALLOW FATTY ACID 51°	Flake	197~207	28 ↓	51~54		3 ↓ (Gardner)
TALLOW FATTY ACID	TALLOW FATTY ACID No.0	Solid	200~208	51~63	38~44	—	6 ↓ (Gardner)
	TALLOW FATTY ACID No.1		197~207	45~53	40~44		
FATTY ACID FOR SOAP	FATTY ACID FOR SOAP	Solid	212~225	34~38	39~44	—	120 ↓
	FAK-2 (for Soap)		220~230	31~39	38~42		
	FAK-4 (for Soap)		205~225	29~44	39~46		
HYDROGENATED CASTOR OIL FATTY ACID	HYDROGENATED CASTOR OIL FATTY ACID (12-Hydroxystearic Acid)	Flake	178~187	6 ↓	70 ↑	150 ↑	—

1.4 OTHER FATTY ACID (Fatty Acid Composition)

Product Name	Typical Fatty Acid Composition (%)								
	Saturated Acid						Unsaturated Acid		
	C12	C14	C16	C18	*C18	C20	C16	C18	C18
HARDENED TALLOW FATTY ACID 45° HFA		3	25	23			4	40	1
HARDENED TALLOW FATTY ACID 51°		3	42	40				10	2
TALLOW FATTY ACID No.0		2	22	22			2	35	12
TALLOW FATTY ACID No.1		3	24	25			4	35	8
FATTY ACID FOR SOAP	10	5	23	20			1	35	2
FAK-2 (for Soap)	20	8	32	7				27	5
FAK-4 (for Soap)	15	5	12	25				40	1
HYDROGENATED CASTOR OIL FATTY ACID			2	12	*83	1		*2	

*Contains a Hydroxyl Group

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1. 5 UNSATURATED ACID

1. 5. 1 Oleic acid (Typical Specifications)

Ingredient	Product Name	Appearance	Neutralization Value	Iodine Value	Titer Test (°C)	Unsaturated Acid (%)	Color (APHA)
OLEIC ACID	NAA [®] -34	Light Yellow	198~205	87~93	8 ↓	90	260 ↓
	NAA [®] -35		196~205	85~95		89	8 ↓ (Gardner)
	EXTRA [™] OLEIN	Viscous Liquid	198~204	86~91	7 ↓	92	100 ↓
	EXTRA [™] OS-85		195~204 (Acid Value)	80~95	15 ↓ (Melting Point)	92	80 ↓

1. 5. 2 Erucic acid (Typical Specifications)

Ingredient	Product Name	Appearance	Neutralization Value	Iodine Value	Titer Test (°C)	Unsaturated Acid (C ₂₂)(%)	Color (APHA)
ERUCIC ACID	ERUCIC ACID	Light Yellow Solid	158~168	71~81	25~35	88 ↑	200 ↓

2.HARDENED OIL (Triglyceride)

2.1 TALLOW HARDENED OIL (Typical Specifications)

Ingredient	Product Name	Appearance	Saponification Value	Acid Value	Iodine Value	Melting Point (°C)	Color (APHA)
TALLOW HARDENED OIL	TALLOW HARDENED OIL 51° HO	Flake	190~200	2 ↓	32 ↓	50~52	150 ↓
	TALLOW HARDENED OIL 54° HO				25 ↓	53~55	200 ↓
	TALLOW HARDENED OIL EXTREMELY HARD				2 ↓	57 ↑	140 ↓

2.2 TALLOW HARDENED OIL (Fatty Acid Composition)

Product Name	Typical Fatty Acid Composition (%)							
	Saturated Acid					Unsaturated Acid		
	C10	C12	C14	C16	C18	C16	C18	C18
TALLOW HARDENED OIL 51° HO	1	1	4	27	34	3	30	
TALLOW HARDENED OIL 54° HO	1	1	4	27	44	3	20	
TALLOW HARDENED OIL EXTREMELY HARD	1	1	4	30	63		1	

2.3 HYDROGENATED CASTOR OIL

Ingredient	Product Name	Appearance	Saponification Value	Acid Value	Iodine Value	Melting Point (°C)	Hydroxyl Value
HYDROGENATED CASTOR OIL	CASTER WAX	Flake	176~187	2 ↓	2.5 ↓	85 ↑	155~165

2.4 HYDROGENATED CASTOR OIL (Fatty Acid Composition)

Product Name	Typical Fatty Acid Composition (%)							
	Saturated Acid					Unsaturated Acid		
	C14	C16	C18	*C18	C20	C18	*C18	C18
CASTER WAX FLAKE		2	12	*83	1		*2	

* Contains a Hydroxyl Group.

3.HIGHER ALCOHOL

3. 1 HIGHER ALCOHOL (Typical Specifications)

Ingredient	Product Name	Appearance	Saponnification Value	Iodine Value	Hydroxyl Value	Melting Point (°C)	Color (APHA)
LAURYL ALCOHOL	NAA [®] -42	Solid	1 ↓	0.1 ↓	294~304	23~28	30 ↓
MYRISTYL ALCOHOL	NAA [®] -43		2 ↓		254~264	35~43	
CETYL ALCOHOL	NAA [®] -44	Beads	1 ↓	1 ↓	220~235	48.5~52.5	
STEARYL ALCOHOL	NAA [®] -45				200~220	56.5~60.5	
	NAA [®] -46		200~225		55.0~60.0		
CETYL STEARYL ALCOHOL	NAA [®] -48		2 ↓		205~230	51.0~56.0	

3. 2 HIGHER ALCOHOL (Typical Composition)

Ingredient	Product Name	Saturated Alcohol (%)					
		C10	C12	C14	C16	C18	C20
LAURYL ALCOHOL	NAA [®] -42	2	95	3			
MYRISTYL ALCOHOL	NAA [®] -43		2	95	3		
CETYL ALCOHOL	NAA [®] -44			2	95	3	
STEARYL ALCOHOL	NAA [®] -45				5	95	
	NAA [®] -46				15	85	
CETYL STEARYL ALCOHOL	NAA [®] -48				50	50	

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4. GLYCERIN

4.1 INDUSTRIAL-GRADE

Product Name	Glycerin (%)	Density (20°C)	Acidity or Alkalinity (meq/100g)	Chloride Test	Reducing Matter	Ash (%)	Color (Hazen No.)
DG (DYNAMITE GLYCERIN)	98.5 ↑	1.257 ↑	0.3 ↓	Pass	Pass	0.05 ↓	30 ↓
RG (REFINED GLYCERIN)							10 ↓
GLYCERIN 85	84~87	1.221~1.230	—	—	—		10 ↓

4.2 FOOD ADDITIVE-GRADE

Product Name	Glycerin (%)	Identification	Specific Gravity (20/20°C)	Heavy Metals (μg/g)
FOOD ADDITIVE GLYCERIN	98.5 ↑	Pass	1.260~1.264	5.0 ↓

Arsenic (μg/g)	Chloride (Cl %)	Reducing Matter	Residue on Ignition (%)
2.0 ↓	0.003 ↓	Pass	0.01 ↓

4.3 FEED-GRADE

Product Name	Glycerin (%)	Identification	Specific Gravity (20/20°C)	Heavy Metals (ppm)	Arsenic (ppm)
FEED GRADE GLYCERIN	98.5 ↑	Pass	1.260 ↑	5.0 ↓	2.0 ↓

Chloride (Cl %)	Reducing Matter	Residue on Ignition (%)	Color (APHA)
0.001 ↓	Pass	0.01 ↓	10 ↓

4.4 COSMETICS-GRADE

Product Name	Glycerin (%)	Indentification	Specific Gravity (20/20°C)	Color of Solution	Acidity or Alkalinity	Chloride (%)
RG·CO·™	95.0 ↑	Pass	1.251 ↑	Pass	Pass	0.0013 ↓

Sulfate	Ammonium	Heavy Metals (ppm)	Calcium	Arsenic (ppm)	Acrolein or Other Reducing Substance
Pass	Pass	5 ↓	Pass	2 ↓	Pass

Volatile Fatty Acids and Dyes	Fatty Acid and Esters (mL)	Readily Carbonizable Substances	Residue on Ignition (%)
Pass	5 ↑	LIGHT than H	0.01 ↓

4.5 JAPANESE PHARMACOPOEIA-GRADE

Product Name	Glycerin (%)	Indentification	Refractive Index (20°C)	Specific Gravity (20/20°C)	Color (APHA)	Property of Solution
GLYCERIN PG (JP)	84.0~87.0	Pass	1.449~1.454	1.221~1.230	10 ↓	Neutral
CONCENTRATED GLYCERIN (JP)	98.0~101.0		1.470 ↑	1.258 ↑		

Chloride as NaCl (%)	Sulfate (%)	Ammonium Test	Heavy Metals (ppm)	Calcium Test	Arsenic (ppm)	Acrolein, Glucose & Other Reducing Matter
0.001 ↓	0.002 ↓	Pass	5 ↓	Pass	2 ↓	Pass

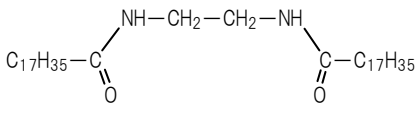
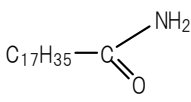
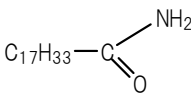
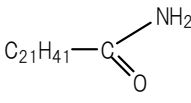
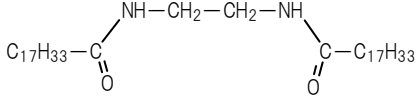
Fatty Acid and Esters (mL)	Sulfuric Acid Coloration	Residue on Ignition (%)	Moisture (%)	Diethyleneglycol and Related Substances
3.0 ↓	LIGHT than H	0.01 ↓	13~17	Pass
			2.0 ↓	

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5.FATTY ACID AMIDE

Product Name	Appearance	Chemical Name	Structural Formula	Melting Point C.MP (°C)
ALFLOW [®] H-50L	Pale Yellow Beads	Ethylene bis stearamide		140~145
ALFLOW [®] H-50S	Pale Yellow Granule *(190 μm)			
ALFLOW [®] H-50F	Pale Yellow Powder *(50 μm)			
ALFLOW [®] H-50T	Pale Yellow Fine Powder *(40 μm)			
ALFLOW [®] H-50P	Pale Yellow Fine Powder *(25 μm)			
ALFLOW [®] H-50TF	Pale Yellow Fine Powder *(18 μm)			
ALFLOW [®] H-50ES	White Emulsified Liquid	(Active Ingredient : 58% Aqueous Dispersion)		—
ALFLOW [®] S-10	White Powder	Stearamide		100~105
ALFLOW [®] E-10	White Beads	Oleylamide		72~76
ALFLOW [®] P-10	White Powder	Erucamide		79~84
ALFLOW [®] AD-281F	Pale Yellow Flake	Ethylene bis oleylamide		115
ALFLOW [®] AD-281P*	Pale Yellow Powder			

*Manufactured-by-Order * Average particle size

6.METALLIC SOAP

6.1 DIRECT METHOD

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Melting Point C.MP (°C)	Free Fatty Acid (%)
CALCIUM STEARATE G	Granule	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Ca} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	3.0 ↓	6.5~7.5	145~160	1.0 ↓
CALCIUM STEARATE GP	Powder					
CALCIUM STEARATE GF-200	Fine Powder					
ZINC LAURATE G	Granule	$\begin{array}{c} \text{C}_{11}\text{H}_{23}\text{COO} \\ \diagdown \\ \text{Zn} \\ \diagup \\ \text{C}_{11}\text{H}_{23}\text{COO} \end{array}$	1.0 ↓	12.0~14.0	125~140	0.5 ↓
ZINC LAURATE GP	Powder					
ZINC STEARATE G	Granule	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Zn} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	0.8 ↓	10.5~11.5	116~125	0.5 ↓
ZINC STEARATE GP	Powder					
ZINC STEARATE GF-200	Fine Powder					
MAGNESIUM STEARATE G	Granule	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Mg} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	6.0 ↓	4.0~4.8	120~140	1.0 ↓
MAGNESIUM STEARATE GR	Powder					
MAGNESIUM STEARATE GP	Powder					
MAGNESIUM STEARATE GF-200	Fine Powder					
BARIUM STEARATE GF ※	Powder	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Ba} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	0.5 ↓	19.5~21.0	—	0.5 ↓

※ **WARNING** : BARIUM STEARATE GF falls under “Non-medicinal deleterious substance.” Please handle with care.

6.2 DOUBLE DECOMPOSITION METHOD (1)

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Melting Point C.M.P (°C)	Free Fatty Acid (%)	
CALCIUM STEARATE	Fine Powder	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \quad \diagup \\ \text{Ca} \\ \diagup \quad \diagdown \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	3.0 ↓	6.5~7.0	150~165	0.5 ↓	
CALCIUM STEARATE S			2.0 ↓	6.4~6.8	148~160		
CALCIUM STEARATE FX (For Coated Sand)			3.0 ↓	6.5~7.0	150~165		
CALCIUM STEARATE (JP)			—	—	—		—
AULABRITE®CA-65 (Food Additive)			—	—	—		—
CALCIUM LAURATE ※Manufactured-by-Order	Fine Powder	$\begin{array}{c} \text{C}_{11}\text{H}_{23}\text{COO} \\ \diagdown \quad \diagup \\ \text{Ca} \\ \diagup \quad \diagdown \\ \text{C}_{11}\text{H}_{23}\text{COO} \end{array}$	5.0 ↓	8.4~9.4	140~160	1.0 ↓	
CALCIUM CASTOR STEARATE ※Manufactured-by-Order	Fine Powder	$\begin{array}{c} \text{RCOO} \\ \diagdown \quad \diagup \\ \text{Ca} \\ \diagup \quad \diagdown \\ \text{RCOO} \end{array}$ RCOO=12-HydroxyStearic Acid	3.0 ↓	6.0~7.0	140~160	1.0 ↓	
POWDER BASE L	Fine Powder	$\begin{array}{c} \text{C}_{11}\text{H}_{23}\text{COO} \\ \diagdown \quad \diagup \\ \text{Zn} \\ \diagup \quad \diagdown \\ \text{C}_{11}\text{H}_{23}\text{COO} \end{array}$	—	13.2~14.2	123~130	0.5 ↓	
POWDER BASE M		$\begin{array}{c} \text{C}_{13}\text{H}_{27}\text{COO} \\ \diagdown \quad \diagup \\ \text{Zn} \\ \diagup \quad \diagdown \\ \text{C}_{13}\text{H}_{27}\text{COO} \end{array}$		12.2~13.2			
ZINC STEARATE		$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \quad \diagup \\ \text{Zn} \\ \diagup \quad \diagdown \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	0.8 ↓	10.5~11.3	116~124	0.5 ↓	
ZINC STEARATE S		0.5 ↓					
ZINC BEHENATE ※Manufactured-by-Order	$\begin{array}{c} \text{C}_{21}\text{H}_{43}\text{COO} \\ \diagdown \quad \diagup \\ \text{Zn} \\ \diagup \quad \diagdown \\ \text{C}_{21}\text{H}_{43}\text{COO} \end{array}$	0.5 ↓	8.2~9.2	125~135	1.0 ↓		
MAGNESIUM STEARATE	Fine Powder	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \quad \diagup \\ \text{Mg} \\ \diagup \quad \diagdown \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	4.0 ↓	4.0~4.5	110~135	1.0 ↓	
MAGNESIUM STEARATE (JP)			6.0 ↓	4.0~5.0	—		
AULABRITE®MA-76 (Food Additive)			—	—	—		—

(JP) Japanese Pharmacopoeia

6.2 DOUBLE DECOMPOSITION METHOD (2)

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Melting Point C.M.P (°C)	Free Fatty Acid (%)
ALUMINUM STEARATE 300	Fine Powder	$\begin{array}{c} \text{HO} \\ \text{HO} \end{array} \begin{array}{l} \diagdown \\ \diagup \end{array} \text{Al} \\ \text{C}_{17}\text{H}_{35}\text{COO}$	1.5 ↓	—	150~165	8.0 ↓
ALUMINUM STEARATE 600		$\text{C}_{17}\text{H}_{35}\text{COO} \begin{array}{l} \diagdown \\ \diagup \end{array} \text{Al} \\ \text{HO} \\ \text{C}_{17}\text{H}_{35}\text{COO}$			140~155	12.0 ↓
ALUMINUM STEARATE 900		$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \text{C}_{17}\text{H}_{35}\text{COO} \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array} \begin{array}{l} \diagdown \\ \diagup \end{array} \text{Al}$			110~125	20~30
BARIUM STEARATE ※	Fine Powder	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array} \begin{array}{l} \diagdown \\ \diagup \end{array} \text{Ba}$	0.5 ↓	19.5~20.5	220 ↑	0.5 ↓

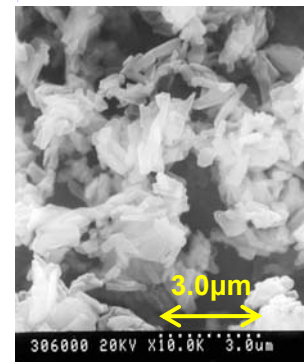
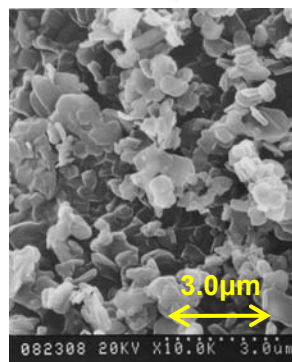
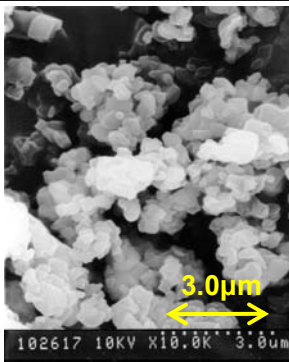
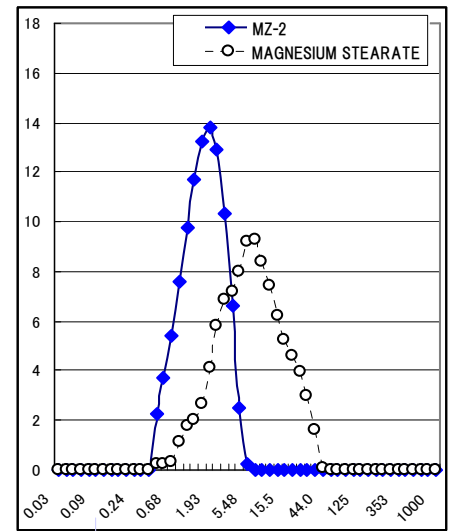
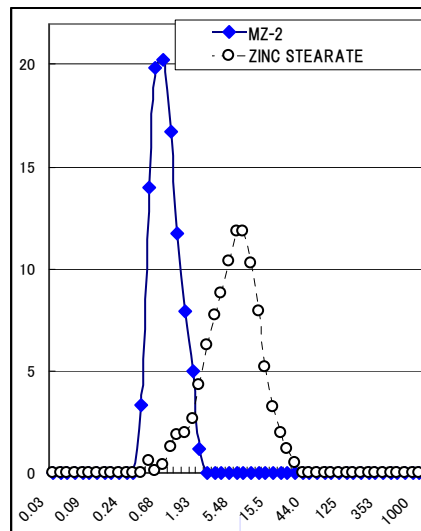
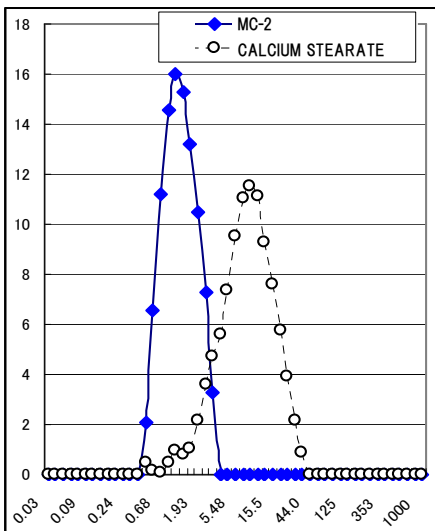
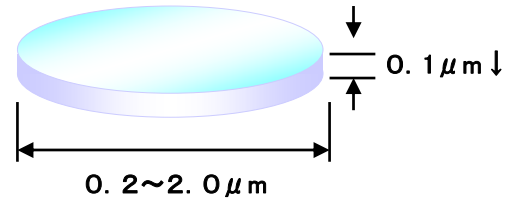
※ **WARNING** : BARIUM STEARATE falls under “Non-medicinal deleterious substance.” Please handle with care.

6.3 HYPERFINE PARTICLES TYPE

Product Name	Structural Formula	Average Particle Size (μm)	Moisture (%)	Metal Content (%)	Melting Point C.M.P ($^{\circ}\text{C}$)	Free Fatty Acid (%)
MC-2	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Ca} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	2.0 ↓	3.0 ↓	6.0~7.0	155~165	0.5 ↓
MZ-2	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Zn} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	1.5 ↓	0.5 ↓	10.0~11.0	125~135	0.5 ↓
MM-2	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Mg} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	3.0 ↓	8.0 ↓	4.0~5.0	110~135	0.5 ↓

Characteristics

- Average particle size 3.0 μm ↓
- Narrow particle size distribution of this product



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6. 4 NEUTRAL TYPE

Product Name	Structural Formula	Appearance	Moisture (%)	Metal Content (%)	Melting Point C.M.P (°C)	pH (2%wt% aq.)
AULABRITE®NC	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Ca} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	Fine Powder	3.0 ↓	6.0~7.0	155~165	6~7
AULABRITE®NM ※Under development	$\begin{array}{c} \text{C}_{17}\text{H}_{35}\text{COO} \\ \diagdown \\ \text{Mg} \\ \diagup \\ \text{C}_{17}\text{H}_{35}\text{COO} \end{array}$	Fine Powder	4.0 ↓	4.0~4.5	110~135	6~7

Characteristics

- **Temporal Xanthosis Restraint of Resin**

AULABRITE® presents neutrality (pH =6-7 degree).It prevent inhibition action for the additives such as antioxidants and so on, and restrain xanthosis of resin.

- **Decomposition Restraint of Resin**

We can use AULABRITE® as color dispersant of the polyesters, polycarbonate which was not use so far.

- **High Thermal Stability**

AULABRITE® is superior in heat stability, it can restrain the coloration to the resin in highmolding temperature in comparison with the conventional grades.

7.ESTERS

7.1 ESTER

Product Name	Appearance	Chemical Name	Main Application	Melting Point (°C)
METHYL LAURATE 95※	Clear Liquid	Methyl laurate	·Raw Materials for Organic Intermediates ·Solvent	* Approx.7
METHYL PALMITATE	Light Yellow Solid	Methyl palmitate		Approx.30
ME-175	Light Yellow Liquid in Summer Light Yellow Solid in Winter	Methyl stearate		27~29
UNISTER [®] M-182A	Light Yellow Liquid	Methyl oleate		* -0 ↓
METHYL ERUCATE	Light Yellow Liquid	Methyl erucate		* -5 ↓
BUTYL LAURATE	Yellow Liquid Liquid	Butyl laurate	Lubricant(for Textile)	* -13~-16
BUTYL STEARATE	Light Yellow Solid	Butyl stearate	Slipping Agent	23
IPM-R	Clear Liquid	Isopropyl myristate	Cosmetic and industrial Emollient	* 3~9
IPP-R		Isopropyl palmitate		* 11
UNISTER [®] MB-816	Light Yellow Liquid	Octyl palmitate	·Fiber Lubricant ·Metal Working Oil	0 (Pour Point)
UNISTER [®] MB-876		Octyl stearate		0 (Pour Point)
UNISTER [®] MB-871		Special fatty acid ester		* Approx.1
UNISTER [®] MB-881		Octyl oleate		-40 (Pour Point)
UNISTER [®] H-470T	Dark Brown Solid	Pentaerythritol	Lubricant	25
UNISTER [®] H-470D		-fatty acid ester		35
Spermaceti	White Flake	Cetyl myristate	Whale Oil Replacement	Approx.50
UNISTER [®] M-9676	Light Yellow Flake	Stearyl stearate	·Slipping Agent For Engineering Plastic, PC,PBT,ABS,Hard PVC, etc.	52~58
UNISTER [®] M-2222SL	White Powder	Behenyl behenate		70
UNISTER [®] H-476	White Flake	Pentaerythritol		60~65
WE-476	Beads	-tetrastearate		
UNISTER [®] H-476D	White Flake	Pentaerythritol- distearate		

※Manufactured-by-Order

* Freezing Point

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7.2 MEDIUM CHAIN FATTY ACID TRIGLYCERIDE

Product Name	Appearance	Structural Formula	Main Application	Kinematic Viscosity (40°C) (mm ² /s)	Freezing Point(°C)
PANACET [®] 800 ※Small-lot production	Liquid		· Food Lubricating Agent	12	-5 ↓
PANACET [®] 875	Liquid		· Food Oils and Fats	13	-5 ↓
PANACET [®] 810 PANACET [®] 810S PANACET [®] 810S (JPE)			· Releasing Oil · Solubilizer · Plasticizer	13	0 ↓
PANACET [®] 800B (Food Oils and Fats Not Applicable)	Liquid		800 R=C ₇ H ₁₅ 875 R=C ₇ H ₁₅ , R=C ₉ H ₁₉ 810 R=C ₇ H ₁₅ , R=C ₈ H ₁₇ 800B R=C ₄ H ₉ CH(C ₂ H ₅)	· Releasing Oil · Solubilizer · Plasticizer	—

(JPE) Japanese Pharmaceutical Excipients

7.3 HIGH-PURIFIED SOLID TYPE ESTER (Typical Specifications)

Product Name	Appearance	Acid Value (mgKOH/g)	Melting Point C.M.P (°C)	Residue on Drying (%)	Hydroxyl Value	Color (Gardner)
WEP-2	Beads	0.1	60±1	0.1~0.3	4.0 ↓	1
WEP-3			73±1			1
WEP-4			71±1			
WEP-5			82±1			
WEP-6			77±1			1
WEP-7			70±1			2
WEP-8			79±1			1
WEP-9			0.5			80±1
WEP-10		0.1	69±1		4.0 ↓	1

Characteristics

WE series (WE-2 - WE-6) are high-purified solid type esters developed by our new manufacturing technology of fatty acid derivatives. They have various interesting properties. They are used for wax for toners from the feature of sharp melting curve, and are used for mold-releasing agent from the feature of high heat stability.

7. 4 POLYOL ESTER for LUBRICATING OIL (Typical Specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (°C)	Kinematic Viscosity (mm ² /s)		Viscosity Index	Pour Point (°C)
			40°C	100°C		
UNISTER [®] HR-208BRS	0.1 ↓	168	7.6	2.1	52	-50
UNISTER [®] HP-210R	0.1	216	10.6	3.0	146	-7.5
UNISTER [®] H-2408BR-22*	0.1 ↓	204	21.8	4.1	72	-50
UNISTER [®] HP-281R	0.1	278	24.1	5.9	206	-30
UNISTER [®] H-334R	0.1	260	19.6	4.4	140	-40
UNISTER [®] H-327R	0.1	262	20.4	4.5	138	-45
UNISTER [®] H-310R	0.1	273	24.8	5.2	148	-10
UNISTER [®] H-310D	2.8	216	33.1	5.6	104	-37.5
UNISTER [®] H-312R	0.2	284	33.7	6.7	160	-1.5
UNISTER [®] H-385	2.2	277	46.7	9.2	184	-5
UNISTER [®] H-385R	0.4	282	49.9	9.9	189	-5
UNISTER [®] H-381	2.3	314	49.5	9.6	183	-32.5
UNISTER [®] H-381R	0.3	324	48.7	9.8	192	-32.5
UNISTER [®] H-345	3.5	238	83.2	12.4	146	-5
UNISTER [®] H-481R	0.5	330	64.6	12.3	191	-20
UNISTER [®] H-445R	2.3	240	120	17.2	157	-2.5
UNISTER [®] H-481D	1.5	286	130	14.9	116	-27.5
UNISTER [®] HR-20B *	0.1	266	19.4	4.9	190	-17.5
UNISTER [®] HR-20	0.1	266	19.9	5.1	201	-32.5
UNISTER [®] HR-32	0.1 ↓	273	33.5	5.8	114	-50
UNISTER [®] HR-64	0.1	283	64.8	9.0	113	-37.5
UNISTER [®] HR-170R *	0.1	303	167	17.6	115	-35
UNISTER [®] HR-200	0.1 ↓	298	235	17.9	81	-30
UNISTER [®] H-609BR	0.3	302	462	28.1	85	-17.5

*Manufactured-by-Order

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7.5 MONO ESTER for LUBRICATING OIL (Typical Specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (°C)	Kinematic Viscosity (mm ² /s)		Viscosity Index	Pour Point (°C)
			40°C	100°C		
UNISTER [®] M-182A	0.2	183	4.4	1.8	151	0 ↓ (Freezing Point)
UNISTER [®] M-476	0.1	193	6.7	2.4	203	23 (Melting Point)
UNISTER [®] MB-816	0.1	204	8.4	2.6	165	0
UNISTER [®] MB-881	0.3	224	8.4	2.7	174	-40
UNISTER [®] MB-876	0.1	205	9.7	2.9	167	0

7.6 COMPLEX[™] ESTER (Typical Specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (°C)	Kinematic Viscosity (mm ² /s)		Viscosity Index	Pour Point (°C)
			40°C	100°C		
UNISTER [®] C-3371A	1.7	250	77.4	11.4	141	-47.5
UNISTER [®] C-3373A	2.8	265	245	29.5	159	-32.5
UNISTER [®] TOE-500	3.6	284	557	58.9	175	-32.5
UNISTER [®] TOE-2500	3.6	290	2622	199	198	-12.5
UNISTER [®] TOE-100	5.4	256	96.8	14.2	150	-7.5
UNISTER [®] DOE-330 ※	3.6	318	330	37.3	162	-32.5

※Manufactured-by-Order

Characteristics

Wide viscosity area at high viscosity level, low volatility, superior low temperature fluidity, superb shear stability, highly lubricating.

7.7 BIODEGRADABLE HYDRAULIC FLUIDS (Typical Specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (°C)	Kinematic Viscosity (mm ² /s)		Viscosity Index	Pour Point (°C)
			40°C	100°C		
MILLUBE [®] E-22A ※	0.6	284	24.2	6.0	211	-30
MILLUBE [®] E-32A	0.6	286	32.0	7.0	189	-30
MILLUBE [®] E-46A ※	0.6	296	45.7	9.0	184	-30

※Manufactured-by-Order

Characteristics

"MILLUBE[®] E series " are biodegradable hydraulic fluids which have many features other than good biodegradability, including good lubricity, low toxicity, and fire retardancy with higher flash point.

8.AMINE

8.1 PRIMARY AMINE

Product Name	Appearance	Chemical Name	Structural Formula	Total Amine Value	Freezing Point (°C)
NISSAN AMINE [®] BB	White Waxy Solid	Dodecylamine	$C_{12}H_{25}-NH_2$	292~306	Approx.28 (Melting Point)
NISSAN AMINE [®] FB	Light Yellow Liquid	Coco-alkylamine	$R-NH_2$	270~290	17
NISSAN AMINE [®] MB	White Waxy Solid	Tetradecylamine	$C_{14}H_{29}-NH_2$	253~265	Approx.38
NISSAN AMINE [®] PB	White Waxy Solid	Hexadecylamine	$C_{16}H_{33}-NH_2$	223~233	47
NISSAN AMINE [®] PB FLAKE	White~Light Yellow Brown Flake				
NISSAN AMINE [®] AB	White~Light Yellow Solid	Octadecylamine	$C_{18}H_{37}-NH_2$	203~213	Approx.53 (Melting Point)
NISSAN AMINE [®] AB FLAKE	White Flake				
NISSAN AMINE [®] ABT	White~Light Yellow Solid	Hardened tallow -alkylamine	$R-NH_2$	204~219	40~46
NISSAN AMINE [®] ABT FLAKE	White~Light Yellow Flake				
NISSAN AMINE [®] ABT-2	White Waxy Solid (20°C)	Tallow alkylamine		208~220	30~40
NISSAN AMINE [®] M-14	Light Yellow Liquid	1-amino-3-undecanoxy -propane	$RO(CH_2)_3NH_2$	214~244	0 ↓
NISSAN AMINE [®] OB	Dark Brown Liquid in Summer Light Yellow Solid in Winter	Oleylamine	$C_{18}H_{35}-NH_2$	200~216	Approx.15
NISSAN AMINE [®] SB	Light Yellow Solid	Soybean alkylamine	$R-NH_2$	197~217	20~30
NISSAN AMINE [®] VB	White Waxy Solid	Behenylamine	$C_{22}H_{45}-NH_2$	168~188	55~65

(Main Application) Curling agent for epoxy resin, pigment flushing agent, rust inhibitor, intermediate products.

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8.2 TERTIARY AMINE

Product Name	Appearance	Chemical Name	Structural Formula	Total Amine Value	Freezing Point (°C)
TERTIARY NISSAN AMINE [®] BB	Clear~Light Yellow Liquid	Dodecyl -dimethyl amine	$C_{12}H_{25}-N\begin{matrix} \diagup CH_3 \\ \diagdown CH_3 \end{matrix}$	243~266	-15
TERTIARY NISSAN AMINE [®] FB*	Light Yellow Liquid	Coconut alkyl -dimethyl amine	$R-N\begin{matrix} \diagup CH_3 \\ \diagdown CH_3 \end{matrix}$	230~250	-15 ↓
TERTIARY NISSAN AMINE [®] MB*	Clear~Light Yellow Liquid	Tetradecyl -dimethyl amine	$C_{14}H_{29}-N\begin{matrix} \diagup CH_3 \\ \diagdown CH_3 \end{matrix}$	217~237	-8
TERTIARY NISSAN AMINE [®] PB*		Hexadecyl -dimethyl amine	$C_{16}H_{33}-N\begin{matrix} \diagup CH_3 \\ \diagdown CH_3 \end{matrix}$	190~210	—
TERTIARY NISSAN AMINE [®] AB	White~Light Yellow Waxy Solid	Octadecyl -dimethyl amine	$C_{18}H_{37}-N\begin{matrix} \diagup CH_3 \\ \diagdown CH_3 \end{matrix}$	170~192	20~23
TERTIARY NISSAN AMINE [®] ABT	Light Yellow Liquid	Hardened tallow alkyl -dimethyl amine	$R-N\begin{matrix} \diagup CH_3 \\ \diagdown CH_3 \end{matrix}$	180~200	18~21

*Manufactured-by-Order

(Main Application) Anti-rust/corrosion agent for lubricating oil, intermediate products.

8.3 DIAMINE

Product Name	Appearance	Chemical Name	Structural Formula	Total Amine Value	Freezing Point (°C)
NISSAN AMINE [®] DT	Yellow Waxy Solid	Tallow alkyl -propylene diamine	$R-NH-C_3H_6-NH_2$	290 ↑	25~34
NISSAN AMINE [®] DT-H	Dark Brown Flake	Hardened tallow alkyl -propylene diamine		320 ↑	40~42
NISSAN AMINE [®] DOB-R	Yellow~Brown Liquid	Oleyl -propylene diamine	$C_{18}H_{35}-NH-C_3H_6-NH_2$	320~350	Approx.20

(Main Application) Anti-rust/corrosion agent for lubricating oil, intermediate products.

NOF CORPORATION don't acknowledge and undertake any guarantees for any date, evaluation results, chemical hazards etc.

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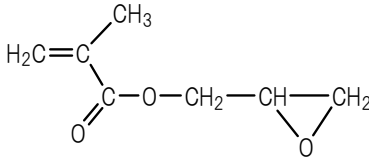
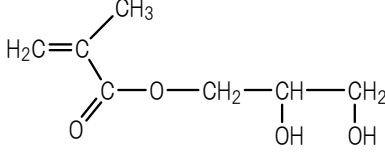
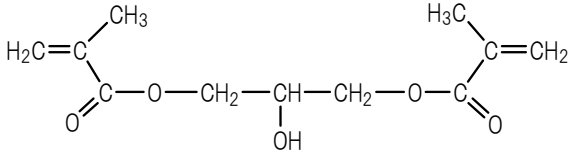
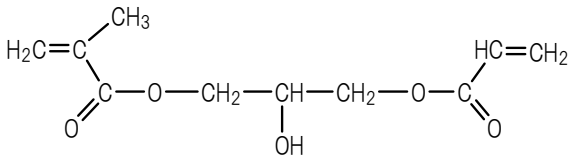
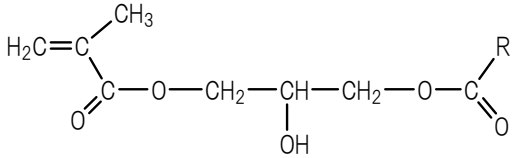
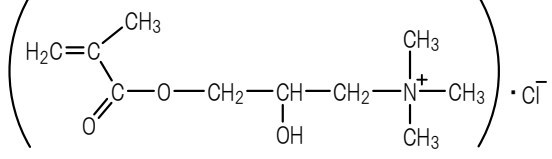
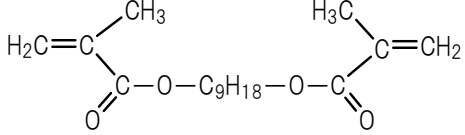
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9.FATTY ACID CHLORIDE

Product Name	Appearance	Structural Formula	Chloride (%)	Phosphorus (%)	Free Fatty Acid (%)	Freezing Point (°C)
LAUROYL CHLORIDE	Light Yellow Liquid	$C_{11}H_{23}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	17.5~20.5	1.5 ↓	4.0 ↓	-17
MYRISTOYL CHLORIDE		$C_{13}H_{27}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	15.0~18.0	1.5 ↓	3.0 ↓	3
DISTILLED PALMITOYL CHLORIDE		$C_{15}H_{31}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	12.0~13.5	0.1 ↓	0.8 ↓	11~12
DISTILLED ISOPALMITOYL CHLORIDE		$C_{15}H_{31}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	12.0~14.0	0.2 ↓	1.5 ↓	-50 ↓
REFINED STEAROYL CHLORIDE		$C_{17}H_{35}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	11.5~13.0	0.1 ↓	1.5 ↓	Approx.10
REFINED ISOSTEAROYL CHLORIDE		$C_{17}H_{35}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	10.1~12.1	0.1 ↓	2.5 ↓	-50 ↓
OLEYL CHLORIDE		$C_{17}H_{33}-C \begin{matrix} \nearrow O \\ \searrow Cl \end{matrix}$	12.5~15.5	1.5 ↓	6.5 ↓	Approx.-44

10. MONOMERS and GLYCIDYL ETHERS

10.1 GLYCIDYL METHACRYLATE and SPECIALITY MONOMER

Product Name	Chemical Name	Structural Formula
BLEMMER [®] G	Glycidyl methacrylate	
BLEMMER [®] GH (Low Epichlorohydrin Grade)		
BLEMMER [®] GS (Chlorine-Free)		
BLEMMER [®] GLM	Glyceryl monomethacrylate	
BLEMMER [®] GLM-R ※ (Chlorine-Free)		
BLEMMER [®] GMR-H ※	Glyceryl dimethacrylate	
BLEMMER [®] GMR-R ※ (Chlorine-Free)		
BLEMMER [®] GAM ※	2-Hydroxy-3-acryloyl -oxypropylmethacrylate	
BLEMMER [®] GAM-R ※ (Chlorine-Free)		
BLEMMER [®] G-FA80	Fatty acid modified -glycidyl methacrylate (20% Solvent Dilution)	
BLEMMER [®] QA	N,N,N-Trimethyl-N-(2-hydroxy -3-metacryloyloxopropyl) -ammonium chloride (50% Aqueous Solution)	
BLEMMER [®] NDMA	1,9-Nonanediol dimethacrylate	

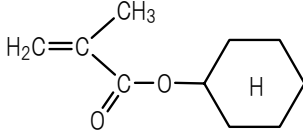
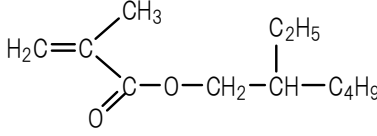
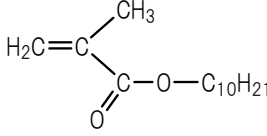
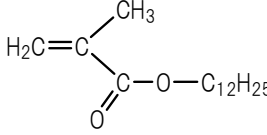
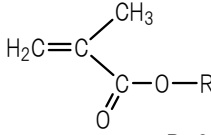
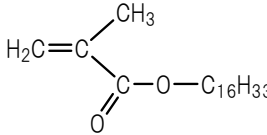
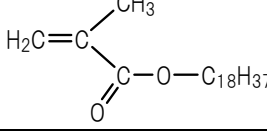
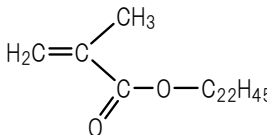
※Under development

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10.2 ALKYL METHACRYLATE

Product Name	Chemical Name	Structural Formula	Pour Point (°C)
BLEMMER [®] CHMA	Cyclohexyl methacrylate		-50 ↓
BLEMMER [®] EHMA-25	2-Ethylhexyl methacrylate		—
BLEMMER [®] DMA ※	Decyl methacrylate		—
BLEMMER [®] LMA	Lauryl methacrylate		-20
BLEMMER [®] SLMA-S	Alkyl (C ₁₂ , ₁₃) methacrylate	 R=C ₁₂ H ₂₅ , C ₁₃ H ₂₇	—
BLEMMER [®] SLMA-SH			
BLEMMER [®] CMA ※	Alkyl (C ₁₄₋₁₈) methacrylate (C ₁₆ :70%)		Approx.12 (Freezing Point)
BLEMMER [®] SMA	Stearyl methacrylate		18~20
BLEMMER [®] VMA ※	Behenyl methacrylate (C ₂₂ :98%)		Approx.44
BLEMMER [®] VMA-70	Behenyl methacrylate (C ₂₂ :70%)		Approx.38

※Manufactured-by-Order

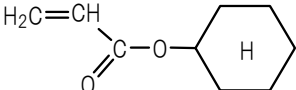
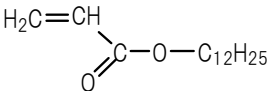
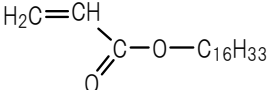
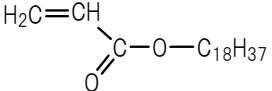
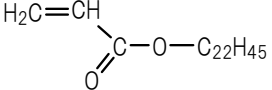
(WARNING)

When melting solid monomer, avoid local heating. Heating temperature should not exceed 60°C.

Wait until monomer is completely melted before using.

In locally melted states, composition and distribution of polymerization inhibitor may not stay uniform.

10.3 ALKYL ACRYLATE

Product Name	Chemical Name	Structural Formula	Pour Point (°C)
BLEMER [®] CHA	Cyclohexyl acrylate		-60 ↓
BLEMER [®] LA	Lauryl acrylate		0
BLEMER [®] CA ※Manufactured-by-Order	Cetyl acrylate (C ₁₆ :95%)		19 (Freezing Point)
BLEMER [®] SA	Stearyl acrylate		Approx.30
BLEMER [®] VA	Behenyl acrylate (C ₂₂ :98%)		Approx.46

(WARNING)

When melting solid monomer, avoid local heating. Heating temperature should not exceed 60°C.

Wait until monomer is completely melted before using.

In locally melted states, composition and distribution of polymerization inhibitor may not stay uniform.

10.4 OH GROUP TERMINATED (POLYALKYLENEGLYCOL MONOMETHACRYLATE)

Product Name	Chemical Name	Structural Formula
BLEMMER [®] PE-90	Polyethyleneglycol methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}=\text{O}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{array}$ <p>PE-90 $n \doteq 2$ PE-200 $n \doteq 4.5$ PE-350 $n \doteq 8$</p>
BLEMMER [®] PE-200		
BLEMMER [®] PE-350		
BLEMMER [®] PE-350G	(60% Aqueous Solution)	
BLEMMER [®] PP-1000	Polypropyleneglycol methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}=\text{O}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \end{array}$ <p>PP-1000 $n \doteq 4 \sim 6$ PP-500 $n \doteq 9$ PP-800 $n \doteq 13$</p>
BLEMMER [®] PP-500		
BLEMMER [®] PP-800		
BLEMMER [®] 50PEP-300	Poly (ethyleneglycol propyleneglycol) -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}=\text{O}-\text{O} \left[(\text{C}_2\text{H}_4\text{O})_m - (\text{C}_3\text{H}_6\text{O})_n \right] -\text{H} \\ m \doteq 3.5 \quad n \doteq 2.5 \\ * [] : \text{Random Addition} \end{array}$
BLEMMER [®] 70PEP-350B	Polyethyleneglycol polypropyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}=\text{O}-\text{O}-(\text{C}_2\text{H}_4\text{O})_m-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ m \doteq 5 \quad n \doteq 2 \end{array}$
BLEMMER [®] 55PET-800	Poly (ethyleneglycol tetramethyleneglycol) -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}=\text{O}-\text{O} \left[(\text{C}_2\text{H}_4\text{O})_m - (\text{C}_4\text{H}_8\text{O})_n \right] -\text{H} \\ m \doteq 10 \quad n \doteq 5 \\ * [] : \text{Random Addition} \end{array}$
BLEMMER [®] 10PPB-500B ※Manufactured-by-Order	Propyleneglycol polybutyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}=\text{O}-\text{O}-\text{C}_3\text{H}_6\text{O}-(\text{C}_4\text{H}_8\text{O})_n-\text{H} \\ n \doteq 6 \end{array}$

Characteristics

Terminal Hydroxyl Group (-OH) is a special monomer that utilizes the surfactant technology of addition polymerization.

10.5 OH GROUP TERMINATED (POLYALKYLENEGLYCOL MONOACRYLATE)

Product Name	Chemical Name	Structural Formula
BLEMMER [®] AE-90 ※Manufactured-by-Order	Polyethyleneglycol acrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{CH} \\ \\ \text{C}=\text{O}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ \\ \text{O} \end{array}$ <p>AE-90 $n \doteq 2$ AE-200 $n \doteq 4.5$ AE-400 $n \doteq 10$</p>
BLEMMER [®] AE-200		
BLEMMER [®] AE-400		
BLEMMER [®] AP-150 ※	Polypropyleneglycol acrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{CH} \\ \\ \text{C}=\text{O}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{O} \end{array}$ <p>AP-150 $n \doteq 3$ AP-400 $n \doteq 6$ AP-550 $n \doteq 9$ AP-800 $n \doteq 13$</p>
BLEMMER [®] AP-400		
BLEMMER [®] AP-550 ※		
BLEMMER [®] AP-800 ※		

※Under development

Characteristics

Terminal Hydroxyl Group (-OH) is a special monomer that utilizes the surfactant technology of addition polymerization.

10.6 ALKYL GROUP TERMINATED (POLYALKYLENEGLYCOL MONOMETHACRYLATE)

Product Name	Chemical Name	Structural Formula
BLEMMER [®] PME-100	Methoxy polyethyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{CH}_3 \\ \\ \text{O} \end{array}$ PME-100 $n \doteq 2$ PME-200 $n \doteq 4$ PME-400 $n \doteq 9$ PME-1000 $n \doteq 23$ PME-4000 $n \doteq 90$
BLEMMER [®] PME-200		
BLEMMER [®] PME-400		
BLEMMER [®] PME-1000		
BLEMMER [®] PME-4000 ※Small-lot production		
BLEMMER [®] 50POEP-800B	Octoxy polyethyleneglycol -polypropyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_m-(\text{C}_3\text{H}_6\text{O})_n-\text{CH}_2-\text{CH}-\text{C}_4\text{H}_9 \\ \quad \\ \text{O} \quad \text{C}_2\text{H}_5 \end{array}$ $m \doteq 8 \quad n \doteq 6$
BLEMMER [®] PLE-400 ※Under development	Lauroxy polyethyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}_{12}\text{H}_{25} \\ \\ \text{O} \end{array}$ PLE-400 $n \doteq 9$ PLE-1300 $n \doteq 30$
BLEMMER [®] PLE-1300		
BLEMMER [®] PSE-400 ※Under development	Stearoxy polyethyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}_{18}\text{H}_{37} \\ \\ \text{O} \end{array}$ PSE-400 $n \doteq 9$ PSE-1300 $n \doteq 30$
BLEMMER [®] PSE-1300		
BLEMMER [®] PAE-100 ※Small-lot production	Phenoxy polyethyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}_6\text{H}_5 \\ \\ \text{O} \end{array}$ $n = 2$
BLEMMER [®] 43PAPE-600B ※Manufactured-by-Order	Phenoxy polyethyleneglycol -polypropyleneglycol -methacrylate	$\begin{array}{c} \text{H}_2\text{C}=\text{C}-\text{CH}_3 \\ \\ \text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_m-(\text{C}_3\text{H}_6\text{O})_n-\text{C}_6\text{H}_5 \\ \\ \text{O} \end{array}$ $m \doteq 6 \quad n \doteq 6$

(WARNING)

When melting solid monomer, avoid local heating. Heating temperature should not exceed 60°C.

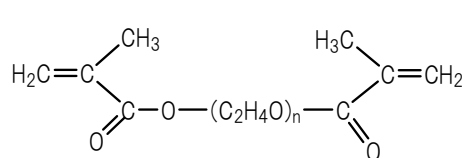
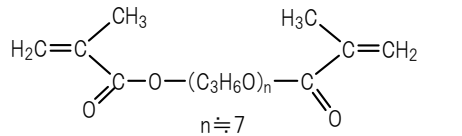
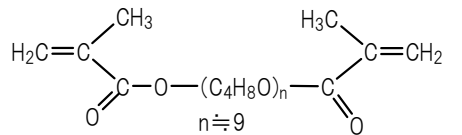
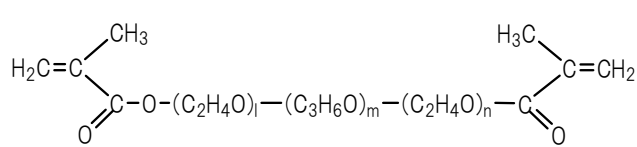
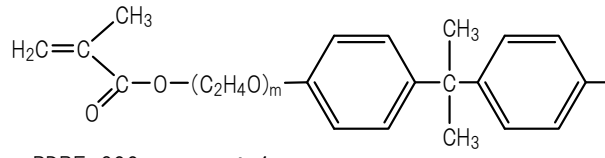
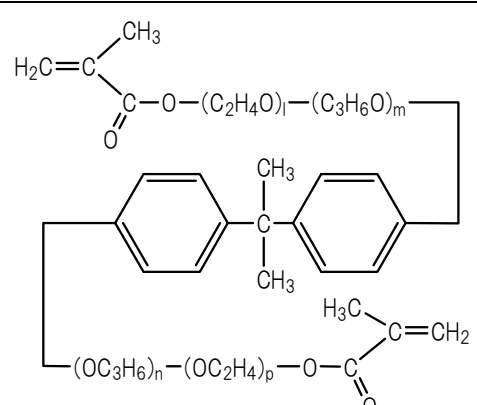
Wait until monomer is completely melted before using.

In locally melted states, composition and distribution of polymerization inhibitor may not stay uniform.

10.7 ALKYL GROUP TERMINATED (POLYALKYLENEGLYCOL MONOACRYLATE)

Product Name	Chemical Name	Structural Formula
BLEMMER [®] AME-400	Methoxy -polyethyleneglycol -acrylate	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{CH}_3$ $n \doteq 9$
BLEMMER [®] ALE-200 ※Under development	Lauroxy -polyethyleneglycol -acrylate	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}_{12}\text{H}_{25}$ $n \doteq 4$
BLEMMER [®] ANP-300	Nonilphenoxy -polypropyleneglycol -acrylate	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{C}_6\text{H}_4-\text{C}_9\text{H}_{19}$ $n \doteq 5$
BLEMMER [®] 75ANEP-600	Nonilphenoxy -poly (ethyleneglycol -propyleneglycol) -acrylate	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-\left[(\text{C}_2\text{H}_4\text{O})_m - (\text{C}_3\text{H}_6\text{O})_n \right] - \text{C}_6\text{H}_4 - \text{C}_9\text{H}_{19}$ <p style="text-align: center;">* [] : Random Addition</p>
BLEMMER [®] AAE-300	Phenoxy -polyethyleneglycol -acrylate	$\text{H}_2\text{C}=\text{CH}-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}_6\text{H}_5$ $n \doteq 5.5$

10.8 POLYALKYLENEGLYCOL DIMETHACRYLATE

Product Name	Chemical Name	Structural Formula
BLEMMER [®] PDE-100 ※	Polyethyleneglycol -dimethacrylate	 <p style="text-align: center;"> PDE-100 n=2 PDE-150 n=3 PDE-200 n=4 PDE-400 n=9 PDE-600 n=14 </p>
BLEMMER [®] PDE-150 ※		
BLEMMER [®] PDE-200		
BLEMMER [®] PDE-400		
BLEMMER [®] PDE-600		
BLEMMER [®] PDP-400N	Polypropyleneglycol -dimethacrylate	 <p style="text-align: center;">n=7</p>
BLEMMER [®] PDT-650 ※Small-lot production	Polytetramethyleneglycol -dimethacrylate	 <p style="text-align: center;">n=9</p>
BLEMMER [®] PDC SERIES ※	Polyethyleneglycol -polypropyleneglycol -polyethyleneglycol -dimethacrylate	
BLEMMER [®] PDBE-200	Ethoxylated bisphenol A -dimethacrylate	 <p style="text-align: center;"> PDBE-200 m + n = 4 PDBE-250 m + n = 6 PDBE-450 m + n = 10 PDBE-1300 m + n = 30 </p>
BLEMMER [®] PDBE-250 ※		
BLEMMER [®] PDBE-450		
BLEMMER [®] PDBE-1300 ※		
BLEMMER [®] PDPE SERIES ※	Ethoxylated propoxylated -bisphenol A -dimethacrylate	 <p style="text-align: center;"> $(OC_3H_6)_n-(OC_2H_4)_p-O-C(=O)-C(CH_3)=CH_2$ </p>

※Manufactured-by-Order

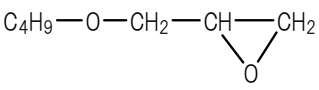
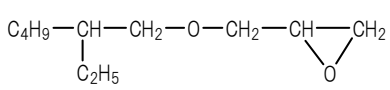
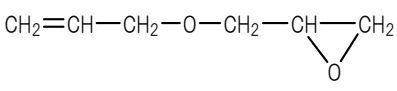
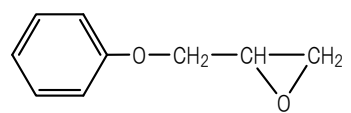
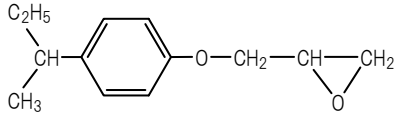
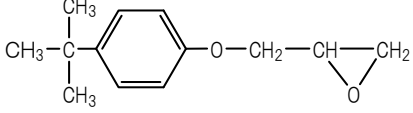
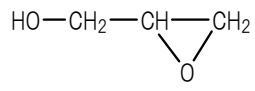
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10.9 POLYALKYLENEGLYCOL DIACRYLATE

Product Name	Chemical Name	Structural Formula
BLEMMER [®] ADE-200	Polyethyleneglycol -diacrylate	$ \begin{array}{c} \text{H}_2\text{C}=\text{CH} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{O} \end{array} -\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\begin{array}{c} \text{O} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{CH}=\text{CH}_2 \end{array} $ ADE-200 $n \doteq 4$ ADE-300 $n \doteq 7$ ADE-400 $n \doteq 9$ ADE-600 $n \doteq 14$
BLEMMER [®] ADE-300		
BLEMMER [®] ADE-400		
BLEMMER [®] ADE-600 ※Smol-lot production		
BLEMMER [®] ADP-400	Polypropylenglycol -diacrylate	$ \begin{array}{c} \text{H}_2\text{C}=\text{CH} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{O} \end{array} -\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\begin{array}{c} \text{O} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{CH}=\text{CH}_2 \end{array} $ $n \doteq 6$
BLEMMER [®] ADT-250 ※Smol-lot production	Polytetramethyleneglycol -diacrylate	$ \begin{array}{c} \text{H}_2\text{C}=\text{CH} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{O} \end{array} -\text{O}-(\text{C}_4\text{H}_8\text{O})_n-\begin{array}{c} \text{O} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{CH}=\text{CH}_2 \end{array} $ $n \doteq 3$
BLEMMER [®] ADC SERIES ※Manufactured-by-Order	Polyethyleneglycol -polypropylenglycol -polyethyleneglycol -diacrylate	$ \begin{array}{c} \text{H}_2\text{C}=\text{CH} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{O} \end{array} -(\text{C}_2\text{H}_4\text{O})_l-(\text{C}_3\text{H}_6\text{O})_m-(\text{C}_2\text{H}_4\text{O})_n-\begin{array}{c} \text{O} \\ \diagdown \\ \text{C}=\text{O} \\ \diagup \\ \text{CH}=\text{CH}_2 \end{array} $

10.10 GLYCIDYL ETHER (1)

Product Name	Appearance	Chemical Name	Structural Formula	Viscosity (25°C) (mPa·s)	Epoxy Equivalent (g/eq.)
EPIOL [®] B ※	Clear~Light Yellow Liquid	1-Butyl -glycidyl ether	$\text{C}_4\text{H}_9\text{—O—CH}_2\text{—CH—CH}_2$ 	1.4	145 ↓
EPIOL [®] B-4 ※				5.5	155 ↓
EPIOL [®] EH-N	Light Yellow Liquid	2-Ethylhexyl -glycidyl ether	$\text{C}_4\text{H}_9\text{—CH—CH}_2\text{—O—CH}_2\text{—CH—CH}_2$ 	2.0	168~262
EPIOL [®] A ※	Clear~Light Yellow Liquid	Allyl -glycidyl ether	$\text{CH}_2=\text{CH—CH}_2\text{—O—CH}_2\text{—CH—CH}_2$ 	1.1	—
EPIOL [®] P ※	Clear~Light Yellow Liquid	Phenyl -glycidyl ether		6	150~163
EPIOL [®] SB	Light Yellow Liquid	<i>p</i> -sec-Butylphenyl -glycidyl ether		15	220~250
EPIOL [®] TB	Light Yellow Liquid	<i>p</i> -tert-Butylphenyl -glycidyl ether		30	4.2 ↑ (eq./kg)
EPIOL [®] OH ※	Colorless Liquid	Glycidol	$\text{HO—CH}_2\text{—CH—CH}_2$ 	4 (20°C)	—

※ WARNING

On February 4, 1991, Labour Standards Bureau in its official notice (#80-2) announced 48 types of existing chemical compounds found to have shown significant mutagenicity. Of our products, EPIOL B, B-4, A, P, and OH are included in the group. **HANDLE THESE PRODUCTS WITH EXTRA CARE.**

10. 10 GLYCIDYL ETHER (2)

Product Name	Appearance	Chemical Name	Structural Formula	Viscosity (25°C) (mPa·s)	Epoxy Equivalent (g/eq.)
EPIOL [®] G-100	Light Yellow Liquid	1,2,3-Propanetriol, -polymer with -(chloromethyl) -oxirane	$ \begin{array}{c} \text{H}_2\text{C}-\text{O}-\text{CH}_2-\text{CH}-\text{CH}_2 \\ \qquad \qquad \qquad \\ \text{O} \qquad \qquad \qquad \text{O} \\ \text{HC}-\text{O}-\text{R} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{CH}_2-\text{CH}-\text{O})_n-\text{CH}_2-\text{CH}-\text{CH}_2 \\ \qquad \qquad \qquad \\ \text{CH}_2\text{Cl} \qquad \qquad \qquad \text{O} \\ n=0, 1 \\ \\ \text{R} = \text{H}, \quad \text{---CH}_2-\text{CH}-\text{CH}_2 \\ \qquad \qquad \qquad \\ \qquad \qquad \qquad \text{O} \end{array} $	120~175	160 ↓
EPIOL [®] E-100LC		2,2'-[Ethylenebis -(oxymethylene)] -bisoxirane	$ \begin{array}{c} \text{H}_2\text{C}-\text{O}-(\text{CH}_2-\text{CH}-\text{O})_n-\text{CH}_2-\text{CH}-\text{CH}_2 \\ \qquad \qquad \qquad \\ \text{CH}_2\text{Cl} \qquad \qquad \qquad \text{O} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{CH}_2-\text{CH}-\text{O})_n-\text{CH}_2-\text{CH}-\text{CH}_2 \\ \qquad \qquad \qquad \\ \text{CH}_2\text{Cl} \qquad \qquad \qquad \text{O} \\ n=0\sim 2 \end{array} $	15	145 ↓
EPIOL [®] E-400 ※		Polyethyleneglycol -diglycidyl ether	$ \begin{array}{c} \text{CH}_2-\text{CH}-\text{CH}_2-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{CH}_2-\text{CH}-\text{CH}_2 \\ \qquad \qquad \qquad \\ \text{O} \qquad \qquad \qquad \text{O} \\ \\ \text{E-400} \quad n \approx 9 \\ \text{E-1000} \quad n \approx 23 \end{array} $	60	263~303
EPIOL [®] E-1000 ※				—	1.35~1.90 (eq./kg)

※Manufactured-by-Order

Epoxy Equivalent (g /eq.)=16X100÷Oxyran Oxygen (%)

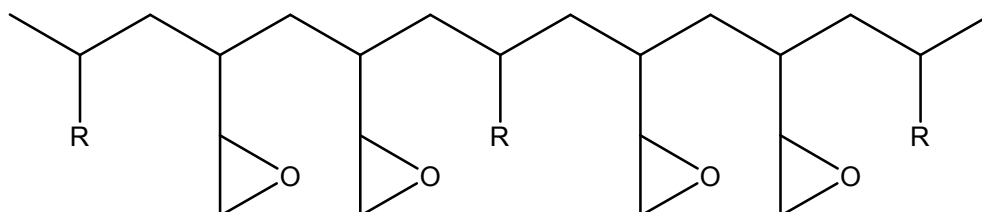
Oxyran Oxygen (%)=16÷Epoxy Equivalent (g/eq.) X100

11. POLYMER WITH GLYCIDYL METHACRYLATE

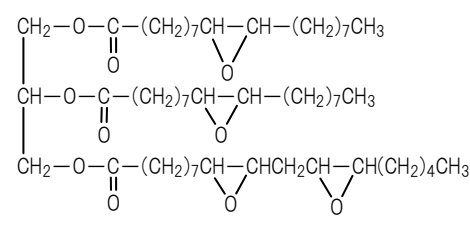
Product Name	Appearance	Category	Weight Average Molecular Weight	Tg (°C)	Epoxy Equivalent (g/eq.)
MARPROOF [®] G-0105SA	Powder	Copolymer with styrene	10,000	90	3,000
MARPROOF [®] G-0130SP		Copolymer with styrene	9,000	69	530
MARPROOF [®] G-0150M		(Meth)Acrylic polymer	8,000~10,000	71	310
MARPROOF [®] G-0250SP		Copolymer with styrene	20,000	74	310
MARPROOF [®] G-1005S		Copolymer with styrene	100,000	96	3,300
MARPROOF [®] G-1005SA ※Manufactured-by-Order		Copolymer with styrene	100,000	98	3,300
MARPROOF [®] G-1010S		Copolymer with styrene	100,000	93	1,700
MARPROOF [®] G-2050M		(Meth)Acrylic polymer	200,000~250,000	74	340
MARPROOF [®] G-01100 ※Manufactured-by-Order	Flake	(Meth)Acrylic polymer	12,000	47	170
MARPROOF [®] G-017581 ※Under development	Block	(Meth)Acrylic polymer	10,000	0 ↓	240

Characteristics

MARPROOF[®]series improve adherence, reactivity and dispersion of paints, glue, synthetic resin, textile and other materials. MARPROOF[®]series can be used as a stabilizing agent (chlorine catcher) for vinyl chloride resin, vinylidene chloride resin and so on.

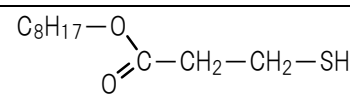
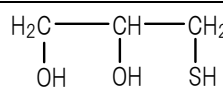


12.FATTY ACID WITH GLYCIDYL

Product Name	Appearance	Structural Formula	Oxyran Oxygen (%)	Melting Point (°C)
NEWCIZER [®] 510R (Epoxyzidized Soybean Oil)	Light Yellow Viscous Liquid		6.7 ↑	5

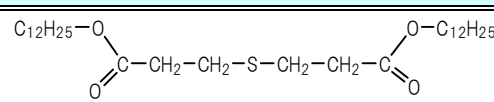
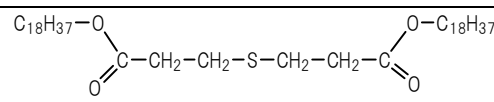
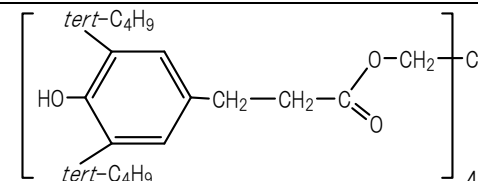
Oxyran Oxygen (%) = 16 ÷ Epoxy Equivalent (g / eq.) × 100 Epoxy Equivalent (g / eq.) = 16 × 100 ÷ Oxyran Oxygen (%)

13.POLYMERIZATION MODIFIER

Product Name	Appearance	Chemical Name	Structural Formula
N-DODECYL MERCAPTAN	Colorless Liquid	n-Dodecyl mercaptan	$C_{12}H_{25}-SH$
NOMP [™] ※Smoll-lot production	Clear~Light Yellow Liquid	n-Octyl 3-mercaptopropionate	
BLEMNER [®] TGL ※Smoll-lot production	Clear Viscous Liquid	1-Thioglycerol	
NOFMER [®] MSD ★	Clear Liquid	α-Methylstyrene dimer	—

★ Contact to : Functional Chemicals & Polymers Division

14.ANTIOXIDANT

Product Name	Appearance	Chemical Name	Structural Formula	Melting Point (°C)
ANTIOX [™] L	White Powder	Dilauryl thiodipropionate		39~42
ANTIOX [™] S	White~Light Yellow Powder	Distearyl thiodistearate		65
ANTIOX [™] 10	Light Yellow Powder	Pentaerythrityl tetrakis -[3-(3,5-di- <i>t</i> -butyl-4-hydroxy -phenyl)-propionate]		120

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15.SURFACTANTS

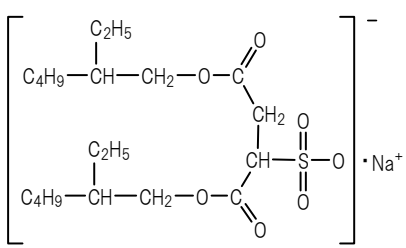
15. 1 ANIONIC SURFACTANT

15. 1. 1 Alkylsulfate, Ethoxysulfate, Alkylethersulfate

Product Name	Appearance	Chemical Name	Structural Formula	Alkyl Composition	Active Component (%)
PERSOFT®SP※	Light Yellow Liquid (Solid in Winter)	Lauryl sulfate ester -sodium salt	$C_{12}H_{25}-O-SO_3Na$	$C_{12}:96 \uparrow$	30
PERSOFT®SF※		Alkyl sulfate ester -sodium salt	$R-O-SO_3Na$	$C_{10} \sim C_{16}$	26
PERSOFT®SK				$C_8 \sim C_{18}$	30
PERSOFT®EP	Light Yellow Liquid Light Yellow Liquid Light Yellow Liquid (Turbid in Winter)	Polyoxyethylene -lauryl ether sulfate -sodium salt	$C_{12}H_{25}-O-(C_2H_4O)_n-SO_3Na$	$C_{12}:96 \uparrow$	25
PERSOFT®EF		Polyoxyethylene -alkyl ether sulfate -sodium salt	$R-O-(C_2H_4O)_n-SO_3Na$	C_{12}, C_{14}	25
PERSOFT®EDO				C_{12}, C_{14}	26
PERSOFT®EL		Coconut	25		
PERSOFT®EK		Coconut	30		
PERSOFT®SF-T		Lauryl sulfate ester -triethanolamine salt	$C_{12}H_{25}-O-SO_3H \cdot N(C_2H_4OH)_3$	C_{12}, C_{14}	40
PERSOFT®EF-T	Light Yellow Liquid	Polyoxyethylene -lauryl ether sulfate -triethanolamine salt	$R-O-(C_2H_4O)_n-SO_3H \cdot N(C_2H_4OH)_3$	C_{12}, C_{14}	36
PERSOFT®EL-T※				Coconut	30
SINTREX EHR	Light Yellow Liquid	2-Ethylehexyl sulfate -ester sodium salt	$\begin{array}{c} C_2H_5 \\ \\ C_4H_9-CH-CH_2-O-SO_3Na \end{array}$	C_8 (Branch)	40

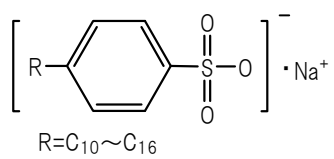
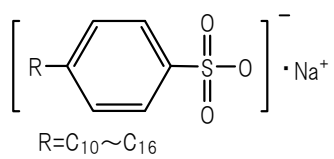
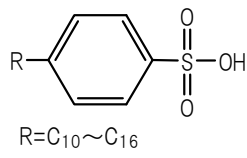
※Manufactured-by-Order

15. 1. 2 Sodium Dialkyl Sulfosuccinate

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
RAPISOL [®] A-30	Clear Viscous Liquid	1,4-Bis(2-ethylhexyl) -sodium sulfosuccinate		30
RAPISOL [®] A-70※	Clear~Light Yellow			70
RAPISOL [®] A-80	Viscous Liquid			80
RAPISOL [®] A-90	White Solid			90

※Small-lot production

15. 1. 3 Alkylbenzene Sulfonate

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NEWREX [®] R-25L	Yellowish White Liquid	Linear alkylbenzene -sulfonic acid sodium salt		Approx.25
NEWREX [®] R	Yellowish White Paste	(Aqueous Solution)		Approx.50
NEWREX [®] SOFT 30	White Powder	Linear alkylbenzene -sulfonic acid sodium salt		Approx.30
NEWREX [®] SOFT 60-N		(Na ₂ SO ₄ Dilution)		Approx.60
NEWREX [®] SOFT 5S	Dark Brown Viscous Liquid	Linear alkylbenzene -sulfonic acid		Approx.96 ↑

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15. 1. 4 Fatty Acid Soap

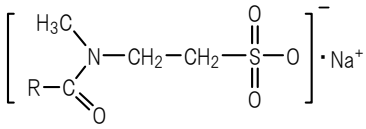
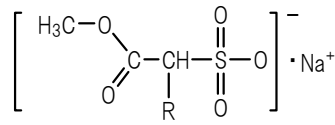
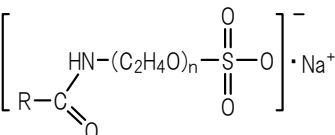
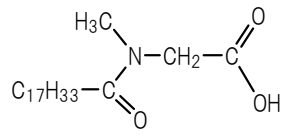
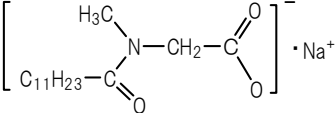
Product Name	Appearance	Chemical Name	Water (%)	Pure Soap (%)
NONSOU TM LK-2	White Flake	Potassium laurate	5 ↓	98 ↑
NONSOU TM LK-5	Light Yellow Flake	Potassium cocoate	—	98 ↑
NONSOU TM LK-30	Light Yellow Liquid	Potassium cocoate (Aqueous Solution)	30	—
NONSOU TM MK-1	White Flake	Potassium myristate	10 ↓	98 ↑
NONSOU TM PK-1	White Flake	Potassium palmitate	10 ↓	97 ↑
NONSOU TM SK-1	White Needle-Shaped	Potassium stearate	8 ↓	96 ↑
NONSOU TM OK-1	Yellow Liquid	Potassium oleate (Aqueous Solution)	18~20	—
NONSOU TM OK-2	Yellow Liquid	Potassium oleate (Aqueous Solution)	40	—
NONSOU TM TK-1	Light Yellow Flake	Potassium salt of fatty acids	10 ↓	—
NONSOU TM LN-1	White Flake	Sodium cocoate	20 ↓	97 ↑
NONSOU TM MN-1	White Flake	Sodium myristate	10 ↓	—
NONSOU TM PN-1	Yellow Needle-Shaped	Sodium salt of fatty acids	13 ↓	97 ↑
NONSOU TM PN-1 POWDER	Light Yellow Powder		7 ↓	
NONSOU TM SN-1	White Flake	Sodium stearate	25 ↓	96 ↑
NONSOU TM SN-15	White Flake		10~15	97 ↑
NONSOU TM SN-1 POWDER	White Powder		15 ↓	96 ↑
NONSOU TM SN-1W1	White Powder		2 ↓	
NONSOU TM ON-A	Yellow Needle-Shaped	Sodium oleate	6 ↓	95 ↑
NONSOU TM ON-A POWDER	Light Yellow Powder			
NONSOU TM ON-1N	Yellow Flake			
NONSOU TM TN-1	White Needle-Shaped	Sodium salt of fatty acids	10 ↓	—
MARSEILLE SOAP	Yellow Needle-Shaped	Sodium salt of fatty acids	10 ↓	96 ↑
MARSEILLE SOAP T POWDER	Yellow Powder		7 ↓	92 ↑
100 MARSEILLE	Stick (25/Set)	(L23.0×W7.3×H4.5)	30 ↓	97 ↑

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15. 1. 5 Other Anionic Surfactant

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
DIAPON [®] S	White Liquid	N-(Fatty acid acyl) -N-methyltaurine sodium salt (Mixed with anionic surfactant)		13
DIAPON [®] LM	White~Light Yellow	N-(Coconut oil acyl) -N-methyltaurine sodium salt		26~29
DIAPON [®] K	Paste			26
DIAPON [®] K-SF	Clear~Light Yellow Liquid			30
DIAPON [®] K-SF POWDER	White~Light Yellow Powder			95
DIAPON [®] HF-SF	Clear~Light Yellow Liquid		N-Decanoyl -N-methyltaurine sodium salt	24~30
Sunbase [®]	Light Yellow Liquid	α-Sulfonated fatty acid -methyl ester sodium salt		28~32
Sunbase [®] FM-2				38~42
SUNAMIDE [®] CF-3	Light Yellow Liquid (Solid in Winter)	Polyoxyethylene fatty acid -monoethanolamide sulfate		34~38
SUNAMIDE [®] CF-10				41~46
OLEOYLSARCOSINE 221P	Light Yellow~Dark Brown Liquid	N-Oleoyl-N-methylglycine (Oleoyl sarcosine)		100
FIRET [®] L	Light Yellow Liquid	N-Lauroyl-N-methylglycine -sodium salt (Sodium lauroyl sarcosine)		30

※Manufactured-by-Order

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15. 2 CATIONIC SURFACTANT

15. 2. 1 Amine Salt Type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN CATION [®] MA	Light Yellow Flake	Tetradecylamine acetate	$C_{14}H_{29}-NH_2 \cdot CH_3-C \begin{matrix} /OH \\ \backslash O \end{matrix}$	100
NISSAN CATION [®] SA		Octadecylamine acetate	$C_{18}H_{37}-NH_2 \cdot CH_3-C \begin{matrix} /OH \\ \backslash O \end{matrix}$	100

15. 2. 2 Trimethyl Type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN CATION [®] BB	Light Yellow Liquid	Dodecyl trimethyl -ammonium chloride (Aqueous Solution)	$\left[\begin{matrix} CH_3 \\ \\ C_{12}H_{25}-N^+-CH_3 \\ \\ CH_3 \end{matrix} \right] \cdot Cl^-$	30
NISSAN CATION [®] FB		Coco-alkyl trimethyl -ammonium chloride (Aqueous Solution)	$\left[\begin{matrix} CH_3 \\ \\ R-N^+-CH_3 \\ \\ CH_3 \end{matrix} \right] \cdot Cl^-$	30
NISSAN CATION [®] PB-300	Light Yellow Liquid	Hexadecyl trimethyl -ammonium chloride (Aqueous Solution)	$\left[\begin{matrix} CH_3 \\ \\ C_{16}H_{33}-N^+-CH_3 \\ \\ CH_3 \end{matrix} \right] \cdot Cl^-$	28
NISSAN CATION [®] PB-40R	Light Yellow Viscous Liquid			Hexadecyl trimethyl -ammonium chloride (Aqueous & IPA Solution)
NISSAN CATION [®] ABT2-500*	Light Yellow Viscous Liquid	Tallow-alkyl trimethyl -ammonium chloride (Aqueous & IPA Solution)	$\left[\begin{matrix} CH_3 \\ \\ R-N^+-CH_3 \\ \\ CH_3 \end{matrix} \right] \cdot Cl^-$	50
NISSAN CATION [®] AB	Light Yellow Viscous Liquid	Octadecyl trimethyl -ammonium chloride (Aqueous & IPA Solution)	$\left[\begin{matrix} CH_3 \\ \\ C_{18}H_{37}-N^+-CH_3 \\ \\ CH_3 \end{matrix} \right] \cdot Cl^-$	20~25
NISSAN CATION [®] AB-600				60~66
NISSAN CATION [®] VB-M FLAKE	Light Yellow Flake	Behenyl trimethyl -ammonium chloride (Contains 20% IPA)	$\left[\begin{matrix} CH_3 \\ \\ C_{22}H_{45}-N^+-CH_3 \\ \\ CH_3 \end{matrix} \right] \cdot Cl^-$	80
NISSAN CATION [®] VB-F	Light Yellow Flake	Behenyl trimethyl -ammonium chloride (Contains 20% Ethanol)		

*Manufactured-by-Order

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15. 2. 3 Dialkyl Type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSANCATION [®] 2-DB-500E	Light Yellow Liquid	Didecyl dimethyl -ammonium chloride (Aqueous & Ethanol Solution)	$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{C}_{10}\text{H}_{21}-\text{N}^+-\text{C}_{10}\text{H}_{21} \\ \\ \text{CH}_3 \end{array} \right] \cdot \text{Cl}^-$	48~52
NISSANCATION [®] 2-DB-800E				Approx.80
NISSAN CATION [®] 2ABT	Light Yellow Viscous Liquid	Bis(hydrogenated tallow -alkyl)dimethyl -ammonium chloride (Aqueous & IPA Solution)	$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{R}-\text{N}^+-\text{R} \\ \\ \text{CH}_3 \end{array} \right] \cdot \text{Cl}^-$	75
NISSAN CATION [®] 2-OLR	Light Yellow Liquid	Dioleyl dimethyl -ammonium chloride (Aqueous & IPA Solution)	$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{C}_{18}\text{H}_{35}-\text{N}^+-\text{C}_{18}\text{H}_{35} \\ \\ \text{CH}_3 \end{array} \right] \cdot \text{Cl}^-$	75

15. 2. 4 Benzyl & Special Type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN CATION [®] F ₂ -50R	Clear~Light Yellow Liquid	Coco-alkyl dimethyl benzyl -ammonium chloride (Aqueous Solution)	$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{R}-\text{N}^+-\text{CH}_2-\text{C}_6\text{H}_5 \\ \\ \text{CH}_3 \end{array} \right] \cdot \text{Cl}^-$	50
NISSAN CATION [®] M ₂ -100R	White~Light Yellow Powder	Tetradecyl dimethyl benzyl -ammonium chloride	$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{C}_{14}\text{H}_{29}-\text{N}^+-\text{CH}_2-\text{C}_6\text{H}_5 \\ \\ \text{CH}_3 \end{array} \right] \cdot \text{Cl}^-$	90 ↑
NISSAN CATION [®] EQ-01D	White Solid	N,N-Diacyloxyethyl-N -hydroxyethyl-N-methyl -ammonium methylsulfate (Contains Diethyleneglycol)	$\left[\begin{array}{c} \text{CH}_3 \\ \\ \text{RCOOC}_2\text{H}_4-\text{N}^+-\text{C}_2\text{H}_4\text{OCOR} \\ \\ \text{C}_2\text{H}_4\text{OH} \end{array} \right] \cdot \text{CH}_3\text{SO}_4^-$	83~87
NISSAN CATION [®] AR-4	Light Yellow Liquid	1-Methyl-1-hydroxyethyl -2-alkyl tallow Imidazolium -chloride (Aqueous & IBA Solution)	$\left[\begin{array}{c} \text{HO}-\text{CH}_2-\text{CH}_2 \\ \\ \text{H}_3\text{C}-\text{N}^+-\text{C}(\text{R})=\text{N} \\ \quad \quad \quad \\ \text{H}_2\text{C} \quad \quad \quad \text{CH}_2 \end{array} \right] \cdot \text{Cl}^-$	35

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15.3 NONIONIC SURFACTANT

15.3.1 Ether Type (1)

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
NONION [®] K-204	Clear~Light Yellow Liquid	Polyoxyethylene -lauryl ether	$C_{12}H_{25}O-(C_2H_4O)_n-H$	9.7	Approx.15
NONION [®] K-220	White~Light Yellow Solid			16.5	Approx.40
NONION [®] K-230				17.5	Approx.45
PERSOFT [®] NK-60	Light Yellow Liquid	Polyoxyethylene alkyl ether (Contains 10% Water)	$R-O-(C_2H_4O)_n-H$	12	5 ↓
PERSOFT [®] NK-100	Light Yellow Liquid	Polyoxyethylene alkyl ether (Contains 20% Water)		14	10 ↓ (Pour Point)
PERSOFT [®] NK-100C	White~Light Yellow Solid (Milky~White Liquid in Summer)	Polyoxyethylene alkyl ether			Approx.25
NONION [®] EAD-13	Clear~Light Yellow Liquid	Polyoxyethylene -alkyl ether	$R-O-(C_2H_4O)_n-H$	13.0	5~25
NONION [®] P-208	White~Light Yellow Solid	Polyoxyethylene -cetyl ether	$C_{16}H_{33}O-(C_2H_4O)_n-H$	11.9	Approx.25
NONION [®] P-210				12.9	Approx.28
NONION [®] P-213				14.1	28~38
NONION [®] E-202	Clear~Light Yellow Liquid	Polyoxyethylene -oleyl ether	$C_{18}H_{35}O-(C_2H_4O)_n-H$	4.9	Approx.2
NONION [®] E-202S				9.0	Approx.2
NONION [®] E-205 NONION [®] E-205S					
NONION [®] E-212	White~Light Yellow Solid			13.3	Approx.31
NONION [®] E-215				14.2	Approx.35
NONION [®] E-230				16.6	Approx.40
NONION [®] S-202				4.9	Approx.40
NONION [®] S-207	White~Light Yellow Solid	Polyoxyethylene -stearyl ether	$C_{18}H_{37}O-(C_2H_4O)_n-H$	10.7	30~36
NONION [®] S-215				14.2	Approx.40
NONION [®] S-220				15.3	Approx.45

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15. 3. 1 Ether Type (2)

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)	
NONION [®] ID-203	Clear~Light Yellow Liquid	Polyoxyethylene -isodecyl ether	$C_{10}H_{21}O-(C_2H_4O)_n-H$	9.5	Approx.-1	
NONION [®] ID-206				12.6	Approx.4	
NONION [®] ID-209				14.4	Approx.15	
NONION [®] EH-204	Clear~Light Yellow Liquid	Polyoxyethylene -2-ethylhexyl ether	$C_8H_{17}O-(C_2H_4O)_n-H$	11.5	-30 ↓	
NONION [®] EH-208				14.6	Approx.-10	
NONION [®] HT-505 ※	Clear~Light Yellow Liquid	Polyoxyethylene -polyoxypropylene -alkyl ether	—	5	Approx.-17	
NONION [®] HT-507 ※				7	Approx.-2	
NONION [®] HT-510 ※				10	Approx.19	
NONION [®] HT-512 ※				White~Light Yellow Solid	12	Approx.26
NONION [®] HT-515 ※					15	Approx.42
NONION [®] HT-518 ※					18	Approx.51

※Under development

15. 3. 2 Special Ether Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)	
DISPANOL [®] 16	White~Light Yellow Solid	Mixture	—	—	Approx.40	
DISPANOL [®] 16A				—	30~36	
DISPANOL [®] LS-100	Clear~Light Yellow Liquid	Special Type		—	—	-25 ↓
DISPANOL [®] TOC				13.0	5~25	
NONION [®] MN-811				9.3	Approx.20	

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15. 3. 3 Polyoxyethylene Alkyl Amine Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)		
NYMEEN [®] L-201	Yellow~Dark Brown Liquid	N-Hydroxyethyl -lauryl amine	$\text{C}_{12}\text{H}_{25}-\text{N} \begin{cases} \text{CH}_2\text{CH}_2\text{OH} \\ \text{H} \end{cases}$	—	Approx.10		
NYMEEN [®] L-202		Polyoxyethylene -lauryl amine	$\text{C}_{12}\text{H}_{25}-\text{N} \begin{cases} (\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases}$	6.2	Approx.15 (Pour Point)		
NYMEEN [®] L-207				12.5	Approx.-5		
NYMEEN [®] F-215			Polyoxyethylene -coco alkyl amine	$\text{R}-\text{N} \begin{cases} (\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases}$	15.6	5 ↓	
NYMEEN [®] S-202	Yellowish~Dark Brown Solid	Polyoxyethylene -stearyl amine	$\text{C}_{18}\text{H}_{37}-\text{N} \begin{cases} (\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases}$	5.0	Approx.45		
NYMEEN [®] S-204	Yellow~Dark Brown Solid			8.0	Approx.25		
NYMEEN [®] S-210	Yellow~Dark Brown Liquid			12.8	Approx.10		
NYMEEN [®] S-215				14.5	Approx.2		
NYMEEN [®] S-220				15.4	Approx.5		
NYMEEN [®] O-205	Yellow~Dark Brown Liquid			Polyoxyethylene -oleyl amine	$\text{C}_{18}\text{H}_{35}-\text{N} \begin{cases} (\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases}$	9.0	0 ↓
NYMEEN [®] T2-202	Yellow~Dark Brown Solid			Polyoxyethylene -tallow alkyl amine	$\text{R}-\text{N} \begin{cases} (\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases}$	5.0	Approx.25
NYMEEN [®] T2-210	Light Yellow~	12.5	0 ↓				
NYMEEN [®] T2-230	Dark Brown Liquid	16.5	Approx.20				
NYMEEN [®] DT-203	Dark Brown Liquid	Polyoxyethylene -alkyl propylene	$\text{R}-\text{N} \begin{cases} \text{C}_3\text{H}_6-\text{N} \begin{cases} (\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases} \\ (\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{cases}$	6.0	Approx.15		
NYMEEN [®] DT-208		-diamine		—	Approx.5		

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15. 3. 4 Ester Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
NONION [®] L-2	Light Yellow Liquid	Polyoxyethylene -monolaurate	$\text{C}_{11}\text{H}_{23}-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H}$	9.9	-3~10
NONION [®] L-4	Clear~Light Yellow Liquid			13.3	Approx.10
NONION [®] S-2	White~Light Yellow Solid	Polyoxyethylene -monostearate	$\text{C}_{17}\text{H}_{35}-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H}$	8.0	33~41
NONION [®] S-4				11.6	30~40
NONION [®] S-6	Yellow~Brown Solid			13.6	Approx.35
NONION [®] S-10	Light Yellow~Dark Brown Solid			15.6	Approx.40
NONION [®] S-15	Light Yellow~Brown Solid			12.8	Approx.40
NONION [®] S-15K					
NONION [®] S-15.4	White~Light Yellow Solid			16.9	40~45
NONION [®] S-15.4V					
NONION [®] S-40	White Flake			18.3	Approx.50
NONION [®] O-2	Yellow~Yellowish			Polyoxyethylene -monooleate	$\text{C}_{17}\text{H}_{33}-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H}$
NONION [®] O-3	Dark Brown Liquid	10.2	Approx.-8		
NONION [®] O-4	Yellow~Dark Brown Viscous Liquid	11.7	Approx.-5		
NONION [®] O-6		13.7	Approx.13		

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15. 3. 5 Diester Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
UNISTER®E-275	Light Yellow Solid	Ethyleneglycol -distearate	$\text{C}_{17}\text{H}_{35}\text{C}(=\text{O})\text{O}-\text{CH}_2-\text{CH}_2-\text{O}-\text{C}(=\text{O})\text{C}_{17}\text{H}_{35}$	—	Approx.63 (Melting Point)
NONION®DS-60HN	Light Yellow Flake	Polyethyleneglycol -distearate	$\text{C}_{17}\text{H}_{35}\text{C}(=\text{O})\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})\text{C}_{17}\text{H}_{35}$	19.0	Approx.60 (Melting Point)
NONION®DO-4	Yellow~Dark	Polyethyleneglycol -dioleate	$\text{C}_{17}\text{H}_{33}\text{C}(=\text{O})\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})\text{C}_{17}\text{H}_{33}$	8.6	25 ↓
NONION®DO-6	Brown Liquid			10.6	
UNISAFE™NKL-9520	Clear~Light Yellow Liquid	Polypropyleneglycol -distearate	$\text{C}_{17}\text{H}_{35}\text{C}(=\text{O})\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{C}(=\text{O})\text{C}_{17}\text{H}_{35}$	—	-10

15. 3. 6 Monoglyceride Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
MONOGLY™D	White Powder	Glycerol mono stearate (Distilled grade)	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_2-\text{O}-\text{C}-\text{R} \\ \\ \text{CH}-\text{OH} \\ \\ \text{CH}_2-\text{OH} \end{array}$	3.8	Approx.66
MONOGLY™MB (Food Additive)	Light Yellow Beads	Glycerol mono stearate		5.5	Approx.60
MONOGLY™M-14	White Powder	Glycerol mono myristate		3.5	Approx.50 (Pour Point)

15. 3. 7 Polyoxyethylene Monoglyceride Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
UNIGLY®MK-207	Clear~Light Yellow Liquid	Polyoxyethylene -glyceryl mono cocoate	$\begin{array}{c} \text{O} \\ \parallel \\ \text{CH}_2-\text{O}-\text{C}-\text{R} \\ \\ \text{CH}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H} \\ \\ \text{CH}_2-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{H} \end{array}$	13.0	Approx.-1.5
UNIGLY®MK-230	Light Yellow Liquid			17.4	Approx.12
UNIGLY®MK-278	White~Light Yellow Solid			18.9	Approx.40

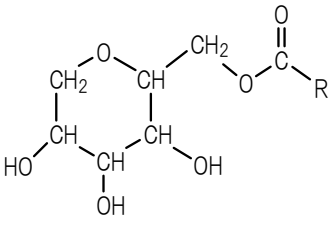
15. 3. 8 Polyoxyethylene Glyceride Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
UNIOX [®] HC-40	Waxy Solid	Polyoxyethylene -hydrogenated -castor oil	$\begin{array}{c} \text{H}_2\text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n\text{H} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})-\text{O}-(\text{C}_2\text{H}_4\text{O})_n\text{H} \end{array}$	13.3	Approx. 25
UNIOX [®] HC-60			15.0	30~35	
UNIOX [®] GT-20IS	Light Yellow Liquid	Triisostearic acid -polyoxyethylene -glyceryl	$\begin{array}{c} \text{H}_2\text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})-\text{R} \\ \\ \text{HC}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})-\text{R} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{C}_2\text{H}_4\text{O})_n-\text{C}(=\text{O})-\text{R} \end{array}$	10.4	0 ↓

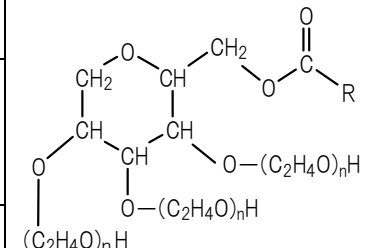
15. 3. 9 Polyglycerin Alkyl Ester Type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
UNIGLY [®] GO-102R	Light Yellow Liquid	Polyglycerin -oleate ester	$\text{C}_{17}\text{H}_{33}-\text{C}(=\text{O})-\text{O}-(\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{O})_n-\text{H}$	8.8	—
UNIGLY [®] GO-106			10.5	—	
UNIGLY [®] GL-106		Polyglycerin -laurate ester	$\text{C}_{11}\text{H}_{23}-\text{C}(=\text{O})-\text{O}-(\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{O})_n-\text{H}$	14.5	Approx. -9
UNIGLY [®] GS-106	Light Yellow Solid	Polyglycerin -stearate ester	$\text{C}_{17}\text{H}_{35}-\text{C}(=\text{O})-\text{O}-(\text{CH}_2\text{CH}(\text{OH})\text{CH}_2\text{O})_n-\text{H}$	11.4	Approx. 60

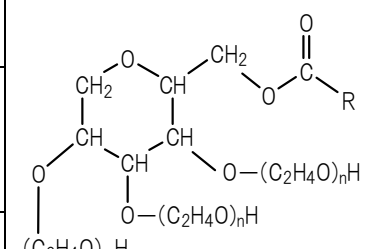
5. 3. 10 Sorbitan Derivatives

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
NONION [®] CP-08R	Yellow~Brown	Sorbitan mono	 <p>(Structural formula is monoester)</p>	9.6	0 ↓
NONION [®] CP-08R (Food Additive)	Viscous Liquid	-caprylate			
NONION [®] LP-20R	Light Yellow	Sorbitan mono		8.6	Approx.16
NONION [®] LP-20R (Food Additive)	Viscous Liquid	-laurate			
NONION [®] MP-30R ※Under development	Yellow Solid	Sorbitan mono		—	Approx.33
NONION [®] PP-40R (Food Additive)	Light Yellow Pellet	Sorbitan mono		6.7	45~51
NONION [®] SP-60R (Food Additive)	Light Yellow Pellet	Sorbitan mono		4.7	49~55
NONION [®] OP-80R	Yellow Viscous Liquid	Sorbitan mono		4.3	5 ↓
NONION [®] OP-83RAT	Brown Viscous Liquid	Sorbitan sesqui		3.7	-10 ↓
NONION [®] OP-85R	Brown~Dark Brown Viscous Liquid	Sorbitan tri		1.8	—

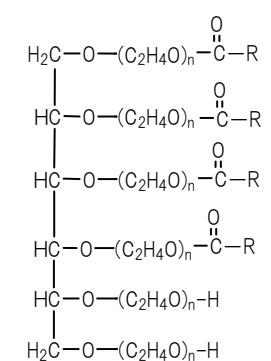
15. 3. 11 Polyoxyethylene Sorbitan Derivatives

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
NONION [®] LT-221	Yellow~Dark Brown Viscous Liquid	Polyoxyethylene -sorbitan mono -laurate		16.7	Approx. -5
NONION [®] ST-221	Light Yellow~Yellow Paste~Solid	Polyoxyethylene -sorbitan mono -stearate		15.7	Approx. 25
NONION [®] OT-221	Light Yellow~Yellow Liquid	Polyoxyethylene -sorbitan mono -oleate		15.7	Approx. -10

15. 3. 12 Polyoxyethylene Sorbitan Derivatives (Food Additive)

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
WILSURF [®] TF-20 (Food Additive)	Yellow~Dark Brown Viscous Liquid	Polyoxyethylene -sorbitan mono -laurate		16.7	Approx. -5
WILSURF [®] TF-60 (Food Additive)	Light Yellow~Yellow Paste~Solid	Polyoxyethylene -sorbitan mono -stearate		15.7	Approx. 24
WILSURF [®] TF-80 (Food Additive)	Light Yellow~Yellow Liquid	Polyoxyethylene -sorbitan mono -oleate		15.7	Approx. -10

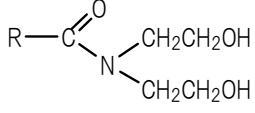
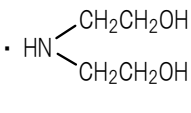
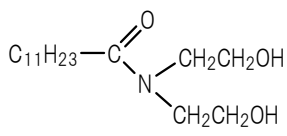
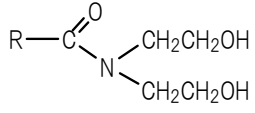
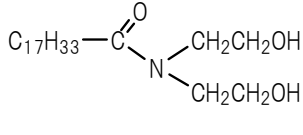
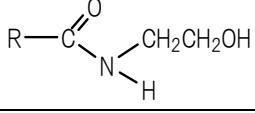
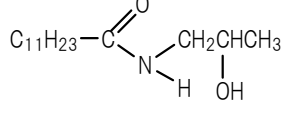
15. 3. 13 Sorbitol Derivatives

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (°C)
UNIOX [®] ST-30E	Light Yellow~Yellow Liquid	Polyoxyethylene -sorbitol tetraoleate		11.2	0 ↓
UNIOX [®] ST-40E				12.5	0 ↓

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15. 3. 14 Alkanol Amide Type

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (°C)
STAFOAM [®] F	Yellow Viscous Liquid	Coconut fatty acid -diethanolamide (1:2 type)		-10
STAFOAM [®] T	Dark Brown Viscous Liquid	Tallow fatty acid -diethanolamide (1:2 type)		25 (Pour Point)
STAFOAM [®] FK	Yellow Viscous Liquid	Special Mixture	—	—
STAFOAM [®] DL	Light Yellow Solid	Lauric acid diethanolamide		40~47 (Pour Point)
STAFOAM [®] DF-1	Light Yellow	Coconut fatty acid -diethanol amide		-4~-7
STAFOAM [®] DF-2	Viscous Liquid			Approx.-5
STAFOAM [®] DF-4	Light Yellow~Yellowish Dark Brown Liquid (Solid in Winter)			12.9
STAFOAM [®] DFC	Light Yellow Viscous Liquid			Approx.-7
STAFOAM [®] DO	Yellow Viscous Liquid	Oleic acid diethanolamide		Approx.6
STAFOAM [®] DOS				
STAFOAM [®] MF PELLET	Light Yellow Pellet	Coconut fatty acid -monoethanolamide		65~75 (Pour Point)
STAFOAM [®] LIPA	Light Yellow Waxy Solid	Lauric acid -monoisopropanolamide		Approx.60 (Pour Point)

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15. 3. 15 Amine Oxide Type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)	Freezing Point (°C)
UNISAFE™ A-LM	Clear~Light Yellow Liquid	Lauryl dimethylamine -oxide solution	$ \begin{array}{c} \text{CH}_3 \\ \\ \text{C}_{12}\text{H}_{25}-\text{N} \rightarrow \text{O} \\ \\ \text{CH}_3 \end{array} $	35	-1
UNISAFE™ A-SM ※	White~Light Yellow Paster	Stearyl dimethylamine -oxide solution	$ \begin{array}{c} \text{CH}_3 \\ \\ \text{C}_{18}\text{H}_{37}-\text{N} \rightarrow \text{O} \\ \\ \text{CH}_3 \end{array} $	35	Approx.25
UNISAFE™ A-LE	Light Yellow Turbid Liquid	Dihydroxyethyl -laurylamine oxide solution	$ \begin{array}{c} \text{CH}_2\text{CH}_2\text{OH} \\ \\ \text{C}_{12}\text{H}_{25}-\text{N} \rightarrow \text{O} \\ \\ \text{CH}_2\text{CH}_2\text{OH} \end{array} $	40	Approx.-4

※Manufactured-by-Order

15. 4 AMPHOTERIC SURFACTANT

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)	
NISSAN ANON [®] BF		Betaines, -coco alkyldimethyl		25	
NISSAN ANON [®] BL	Light Yellow Liquid	1-Dodecanaminium, -N-(carboxymethyl)-N,N -dimethyl-, inner salt		33.5~38.5	
NISSAN ANON [®] BL-SF					
NISSAN ANON [®] BDL-SF	Light Yellow Liquid	1-Propanaminium, -N-(carboxymethyl)-N,N -dimethyl-3-[(1-oxododecyl) -amino]-, inner salt		27~33	
NISSAN ANON [®] BDC-SF	Clear~Light Yellow Liquid	1-Propanaminium, -N-(carboxymethyl)-N,N -dimethyl-3-[(1-oxododecyl) -amino]-, inner salt		30	
NISSAN ANON [®] BDF-SF	Light Yellow Liquid	1-Propanaminium,3-amino -N-(carboxymethyl)-N,N -dimethyl-N-coco acyl derivs -hydroxides, inner salts		30	
NISSAN ANON [®] BDF-R		30			
NISSAN ANON [®] LG-R	Light Yellow Viscous Liquid (Turbid upper 20°C)	Glycine, -N-[2-[[2-(dodecylamino) -ethyl]amino]ethyl]-ethano			30
NISSAN ANON [®] GLM-R	Yellow Liquid	Lmidazolium compounds, 1-(carboxymethyl)-4,5 -dihydro-1-(hydroxyethyl)-2 -norcoco alkyl, hydroxides, -inner salts			30
NISSAN ANON [®] GLM-R-LV					
NISSAN ANON [®] LA	Light Yellow Liquid (Turbid under 20°C)	Sodium laurylamino -diacetate		25~31	

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15. 5 POLYMER SURFACTANT

15. 5. 1 Polymer Surfactant (1)

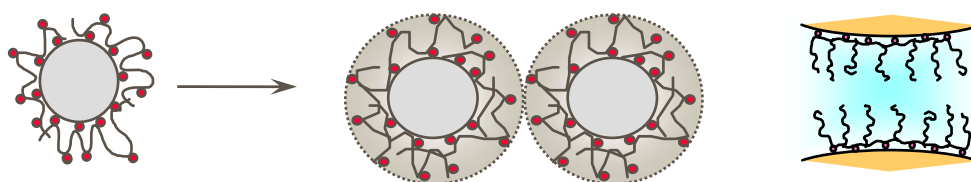
Product Name	Appearance	Chemical Name	Solubility in water	Active Component (%)
POLYSTER [®] OM	Light Yellow Liquid	Sodium salts of high Molecular weigh polycarbonates	◎	Approx.25
POLYSTER [®] OMR	Clear~Light Yellow Liquid		◎	
POLYSTER [®] OMP※	White Powder		◎	100
POLYSTER [®] A-1060	Light Yellow Liquid		◎	Approx.43
POLYSTER [®] SMX-1H※			◎	Approx.23
POLYSTER [®] OMA	Light Yellow Liquid	Ammonium salts of high molecular weight polycarbonates	◎	Approx.21
POLYSTER [®] OMA-500※	~White Emulsified Liquid		◎	Approx.24

※Manufactured-by-Order

15. 5. 2 Polymer Surfactant (2)

Product Name	Appearance	Chemical Name	Solubility in water	Viscosity (100°C)(mm ² /s)
MALIALIM [®] AKM-0531	Yellow~Dark Brown Viscous Liquid	High molecular weight polycarboxylic acids	◎	200
MALIALIM [®] AKM-1511-60	Yellow~Dark Brown Liquid		◎	350 (25°C)
MALIALIM [®] AFB-1521	Yellow~Dark Brown Viscous Liquid		△	300
MALIALIM [®] AAB-0851	Yellow~Yellowish Dark Brown Viscous Liquid		×	300
MALIALIM [®] AWS-0851			Oil Dispersible	500
MALIALIM [®] HKM-50A	Yellow~Dark Brown Viscous Liquid	Ammonium salts of high molecular weight polycarbonates	◎	350 (25°C)

Dispersion (hindrance of secondary coagulation) due to steric hindrance is possible with high molecular weight detergents.



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16.POLYETHER

16.1 POLYETHYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)	
PEG#200	Clear~Light Yellow Liquid	Polyethyleneglycol	$\text{HO}-(\text{C}_2\text{H}_4\text{O})_n-\text{H}$	200	-45 ↓	
PEG#300				300	-8 ↓	
PEG#400				400	6	
PEG#600				600	20	
PEG#1000	White~Light Yellow Solid			1,000	40	
PEG#1500				PEG#300、1540 Mixture	38	
PEG#1540				1,540	45	
PEG#2000				2,000	50	
PEG#4000				White~Light Yellow Flake	3,100	55
PEG#4000P				White~Light Yellow Powder		
PEG#6000	White~Light Yellow Flake			8,800	60	
PEG#6000P	White~Light Yellow Powder					
PEG#11000	White~Light Yellow Flake			11,000	58	
PEG#20000				20,000	65	

★ Urethane-grade also available.

★ MACROGOL (Japanese Pharmacopoeia and Japanese Pharmaceutical Excipients) also available.

★ High purity polyethylene glycol (Contact to : DDS Division)

16.2 SPECIAL POLYETHYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)
UNIOX [®] M-400	Clear~Light Yellow Liquid	Polyethyleneglycol -monomethyl ether	$\text{CH}_3\text{-O-(C}_2\text{H}_4\text{O)}_n\text{-H}$	400	0 ↓
UNIOX [®] M-550				550	15~20
UNIOX [®] M-1000	White~Light Yellow Solid			1,000	Approx.40
UNIOX [®] M-2000	White~Light Yellow Flake			2,000	Approx.50
UNIOX [®] M-3000 ※	White~Light Yellow Solid			3,000	Approx.55
UNIOX [®] M-4000	White~Light Yellow Solid			4,000	Approx.55
UNIOX [®] MM-500	Clear~Light Yellow Liquid	Polyethyleneglycol -dimethyl ether	$\text{CH}_3\text{-O-(C}_2\text{H}_4\text{O)}_n\text{-CH}_3$	550	Approx.13

※Manufactured-by-Order

16.3 GLYCERYL POLYETHYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)
UNIOX [®] G-450	Light Yellow Liquid	Polyethyleneglycol -glyceryl ether	$\begin{array}{c} \text{H}_2\text{C-O-(C}_2\text{H}_4\text{O)}_l\text{-H} \\ \\ \text{HC-O-(C}_2\text{H}_4\text{O)}_m\text{-H} \\ \\ \text{H}_2\text{C-O-(C}_2\text{H}_4\text{O)}_n\text{-H} \end{array}$	450	-20 ↓
UNIOX [®] G-750				750	-20 ↓

16.4 POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Solubility in water	Average Molecular Weight	Pour Point (°C)
UNIOL [®] D-250	Clear~Light Yellow Liquid	Polypropyleneglycol (Diol type)	HO-(C ₃ H ₆ O) _n -H	⊙	250	-30 ↓
UNIOL [®] D-400				⊙	400	-30 ↓
UNIOL [®] D-700				○	700	-40
UNIOL [®] D-1000				×	1,000	-30 ↓
UNIOL [®] D-1200				×	1,200	-30 ↓
UNIOL [®] D-2000				×	2,000	-30 ↓
UNIOL [®] D-4000				×	4,000	-20 ↓

16.5 GLYCERYL POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Solubility in water	Average Molecular Weight	Pour Point (°C)
UNIOL [®] TG-330	Clear~Light Yellow Liquid	Polypropyleneglycol -glyceryl ether (Triol type)	$\begin{array}{c} \text{H}_2\text{C}-\text{O}-(\text{C}_3\text{H}_6\text{O})_l-\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_m-\text{H} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \end{array}$	⊙	330	-25 ↓
UNIOL [®] TG-1000				×	1,000	-25 ↓
UNIOL [®] TG-3000				×	3,000	-30 ↓
UNIOL [®] TG-4000				×	4,000	-25 ↓

16.6 DIGLYCERYL POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)
UNILUBE [®] DGP-700	Light Yellow Viscous Liquid	Polypropyleneglycol -diglyceryl ether	$ \begin{array}{c} \text{H}_2\text{C}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{H}_2\text{C} \\ \\ \text{O} \\ \\ \text{H}_2\text{C} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \end{array} $	700	0 ↓
UNILUBE [®] DGP-700F (Additive Agent Free)					

16.7 SORBITOL POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)
UNIOL [®] HS-1600D	Clear Viscous Liquid	Polypropyleneglycol -sorbitol ether	$ \begin{array}{c} \text{H}_2\text{C}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{HC}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \\ \\ \text{H}_2\text{C}-\text{O}-(\text{C}_3\text{H}_6\text{O})_n-\text{H} \end{array} $	1,600	0 ↓

16.8 POLYBUTYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Pour Point (°C)
UNIOL [®] PB-500	Clear~Light Yellow Liquid	Polybutyleneglycol	HO-(C ₄ H ₈ O) _n -H	500	0 ↓ (Freezing Point)
UNIOL [®] PB-700				700	-40 ↓
UNIOL [®] PB-1000※				1,000	-40 ↓
UNIOL [®] PB-2000※				2,000	-20 ↓

※Under development

16. 9 POLYETHYLENE POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	EO (wt%)	Average Molecular Weight	Freezing Point (°C)
PLONON®#102	Clear~Light Yellow Liquid	Polyethyleneglycol-polypropyleneglycol -polyethyleneglycol (Block copolymer type) HO-(C ₂ H ₄ O) _n -(C ₃ H ₆ O) _m -(C ₂ H ₄ O) _n -H	20	1,250	-20 ↓
PLONON®#104			40	1,670	5 (Pour Point)
PLONON®#201			10	2,220	-10 ↓
PLONON®#202B			20	2,400	-5 ↓ (Pour Point)
PLONON®#204	White Turbid Liquid~Paste		40	3,330	Approx.20
PLONON®#208	White Flake		80	10,000	Approx.52
UNILUBE®70DP-600B	White~Light Yellow Flake		70	10,000	Approx.56
UNILUBE®70DP-950B	70		13,000	Approx.55	

16. 10 TETRAMETHYLENE GLYCOL DERIVATIVES

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)
POLYGERIN®DC-1100	Clear~Light Yellow Liquid	Polyoxytetramethylen -polyoxyethyleneglycol	HO-(C ₄ H ₈ O) _m -(C ₂ H ₄ O) _n -H * []:Random Addition	1,000	0 ↓
POLYGERIN®DC-1800E				1,800	-10 ↓
POLYGERIN®DC-3000E				3,000	-10 ↓
POLYGERIN®DCB-1000*		Polyoxytetramethylen -polyoxypropyleneglycol	HO-(C ₄ H ₈ O) _m -(C ₃ H ₆ O) _n -H * []:Random Addition	1,000	0 ↓
POLYGERIN®DCB-2000*				2,000	0 ↓
POLYGERIN®DCB-4000*				4,000	0 ↓

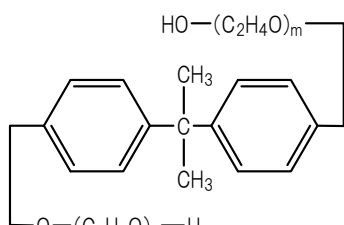
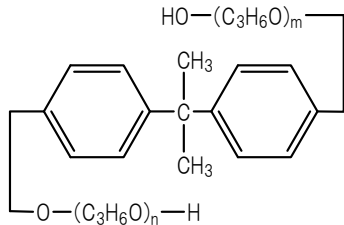
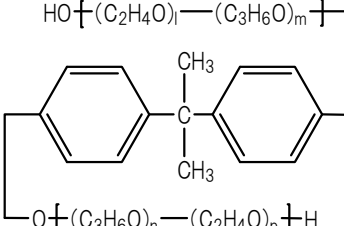
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16. 11 BISPHENOL A DERIVATIVES

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	Freezing Point (°C)
UNIOL [®] DA-400	Liquid	Polyoxyethylene -bisphenol A ether		400	-10 ↓
UNIOL [®] DA-700				660	0
UNIOL [®] DB-400	Viscous Liquid	Polyoxypropylene -bisphenol A ether		400	20 (Pour Point)
UNILUBE [®] 50DB-22	Liquid	Polyoxyethylene -polyoxypropylene -bisphenol A ether	 <p style="text-align: center;">* [] : Random Addition</p>	750	-10 ↓

16. 12 POLYALKYLENE GLYCOL DERIVATIVES (water-soluble type)

Product Name	Appearance	Viscosity (mPa·s)		Viscosity index	Average Molecular Weight	Pour Point (°C)
		(20°C)	(60°C)			
UNILUBE [®] 50MB-2	Clear~Light Yellow Liquid	15	4.5	97	200	-65
UNILUBE [®] 50MB-5		40	10	171	500	-52.5
UNILUBE [®] 50MB-11		120	27	211	1,000	-45
UNILUBE [®] 50MB-26		326	69	228	2,000	-35
UNILUBE [®] 50MB-72		1,020	190	258	3,000	-32.5
UNILUBE [®] 50MB-168		2,880	430	286	4,000	-30
UNILUBE [®] 60MB-2B		10	3	—	220	-40 ↓
UNILUBE [®] 25TG-55	Clear~Light Yellow Liquid	—	164	218	4,550	-17.5
UNILUBE [®] 50TG-32		580	90	209	2,800	-40
UNILUBE [®] 50DE-25	Clear~Light Yellow Liquid	360	132	224	1,750	-45.0
UNILUBE [®] 75DE-25		360	63.8	203	1,400	-15
UNILUBE [®] 75DE-60		—	210	238	3,000	-2.5
UNILUBE [®] 75DE-170※		3,150	580	271	5,000	0
UNILUBE [®] 75DE-2620	Light Yellow Viscous Liquid	—	9,200	—	13,000	5
UNILUBE [®] 75DE-3800		—	12,880	—	15,000	5
UNILUBE [®] 80DE-40U	Clear Liquid	—	71	—	2,000	*20
UNILUBE [®] 80DE-120U※		—	—	—	4,000	*15
UNISAFE [™] AX-22 (Antioxidant Type)	Dark Brown~Reddish Dark Brown Liquid	1,800	72	83.5	—	-10 ↓

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* Melting Point

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16. 13 POLYALKYLENE GLYCOL DERIVATIVES (non-water-soluble type)

Product Name	Appearance	Viscosity (mPa·s)		Viscosity index	Average Molecular Weight	Pour Point (°C)
		(20°C)	(60°C)			
UNILUBE [®] MB-7	Clear~Light Yellow Liquid	69.5	17.3	168	700	-47.5
UNILUBE [®] MB-11		130	28	187	1,000	-42.5
UNILUBE [®] MB-14		168	38.3	195	1,200	-40
UNILUBE [®] MB-19		230	48.2	202	1,300	-35
UNILUBE [®] MB-22		291	55.4	203	1,400	-32.5
UNILUBE [®] MB-38		550	105	212	1,900	-30
UNILUBE [®] MB-370		880	154	229	2,300	-25
UNILUBE [®] MB-700		1,750	275	250	3,000	-22.5
UNILUBE [®] MB-7X (Antioxidant Type)	Redish Liquid	83.6	16.4	155	700	-35 ↓
UNILUBE [®] MB-11X (Antioxidant Type)		159	26	178	1,000	-40 ↓

16. 14 ALLYLPOLYETHERS

Product Name	Appearance	Chemical Name	Structural Formula	Average Molecular Weight	EO/PO Mol Ratio
UNIOX [®] PKA-5001	Liquid	Polyethyleneglycol -allylether	$H_2C=CH-CH_2-O-(C_2H_4O)_n-H$	200	100/0
UNIOX [®] PKA-5002※				400	100/0
UNIOX [®] PKA-5003				450	100/0
UNIOX [®] PKA-5004	Solid			750	100/0
UNIOX [®] PKA-5005				1,500	100/0
UNIOX [®] PKA-5006	Liquid	Methoxy -polyethyleneglycol -allylether	$H_2C=CH-CH_2-O-(C_2H_4O)_n-CH_3$	350	100/0
UNIOX [®] PKA-5007				400	100/0
UNIOX [®] PKA-5008				450	100/0
UNIOX [®] PKA-5009				550	100/0
UNIOX [®] PKA-5010	Solid			1,500	100/0
UNISAFE [™] PKA-5011※	Liquid	Polyethyleneglycol -polypropylene -glycol allylether	$H_2C=CH-CH_2-O-[(C_2H_4O)_m-(C_3H_6O)_n]-H$ * []:Random Addition	750	75/25
UNISAFE [™] PKA-5012※				2,000	75/25
UNILUBE [®] PKA-5013				2,000	50/50
UNISAFE [™] PKA-5014		Plypropyleneglycol -allylether	$H_2C=CH-CH_2-O-(C_3H_6O)_n-H$	1,500	0/100
UNISAFE [™] PKA-5015		Butoxy -polyethyleneglycol	$H_2C=CH-CH_2-O-[(C_2H_4O)_m-(C_3H_6O)_n]-C_4H_9$ * []:Random Addition	1,600	75/25
UNISAFE [™] PKA-5016		-polypropylene -glycol allylether		1,600	50/50
UNISAFE [™] PKA-5017※				2,500	50/50
UNISAFE [™] PKA-5018※		Polypropylene -glycol diallylether	$H_2C=CH-CH_2-O-(C_3H_6O)_n-CH_2-CH=CH_2$	3,000	0/100
UNIOX [®] AA-480R		Polyethyleneglycol -diallylether		$H_2C=CH-CH_2-O-(C_2H_4O)_n-CH_2-CH=CH_2$	500
UNIOX [®] AA-800	800				100/0

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17. FOR CONSTRUCTION & BUILDING MATERIALS

17.1 WATER REDUCING AGENT

Product Name	Appearance	Chemical Name	Main Application
MALIALIM [®] A-20	Yellow~Dark Brown Liquid	Polycarboxylic Acid Type	Water Reducing Agent for Concrete
MALIALIM [®] CL-100	Yellow~Dark Brown Viscous Liquid		Reduction of Methylcellulose

17.2 CEMENT MORTAR AND CONCRETE AGENT

Product Name	Appearance	Chemical Name	Main Application
SYUDOX [®] WRP-150A	White Powder	Polycarboxylic Acid Type	Water Reducing Agent for Concrete
SYUDOX [®] DEF-001-CS	White Powder	—	Defoaming Agent
SYUDOX [®] DEF-001	Clear~Light Yellow Liquid		
SYUDOX [®] PRF-C180	White Fine Powder	Special Metallic Soap Type	Efflorescence Prevention Water & Oil Repellent Agent
SYUDOX [®] PRF-A180			
SYUDOX [®] DSP-E40	White Powde	Polyoxyalkylene Type	Reducing of Drying Shrinkage
SYUDOX [®] DSP-E60			
SYUDOX [®] SP-01S			
SYUDOX [®] DF-40	White Flake		
SYUDOX [®] DSP-2508	Clear~Light Yellow Liquid		
SYUDOX [®] SG-413			

17.3 ASPHALT EMULSIFIER AGENT

Product Name	Appearance	Chemical Name	Freezing Point (°C)	Main Application
ASPHASOL [®] 10	Dark Brown Flake	Amine Type	Approx.40	Asphalt Emulsifier
ASPHASOL [®] 20	Yellow & Waxy	Amine Type	Approx.30	
ASPHASOL [®] 1100	Beads	Fatty Acid Type	Approx.60	

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17.4 ASPHALT RELEASE AGENT

Product Name	Appearance	Chemical Name	Freezing Point (°C)	Flash Point (°C)
ASPHASOL [®] N-02	Red Clear Viscous Liquid	· Natural fats derivatives · Surfactant etc. (mixture)	-20 ↓	No existence
ASPHASOL [®] N-03	Blue Clear Viscous Liquid		-20 ↓	No existence

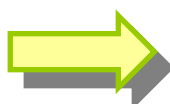
① Release Ability



② No Cut Back



Light oil ASPHASOL 10%aq.



(After 2 hours, 110°C)



Light oil ASPHASOL 10%aq.

③ Stability of Water Solution

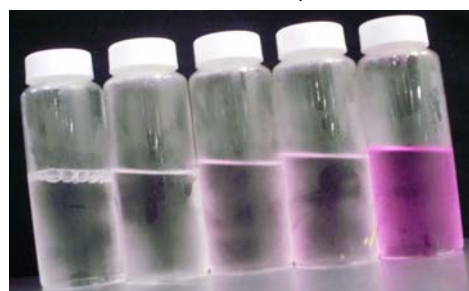
(After 6 months)



ASPHASOL 10%aq. 20%aq.

④ Anti Freeze

(After 24 hours, -5°C)



5%aq. ← 10%aq. ← ASPHASOL

18. DUST & COAL DUST CONTROL AGENT

Product Name	Appearance	Specific gravity (25/4°C)	Viscosity (mPa·s)		pH (1.0wt% aq.)	Pour Point (°C)
			0°C	20°C		
DUSSEAL®F-10 ※Manufactured-by-Order	Clear and Colorless Liquid	1.1	550	150	7.2	-35

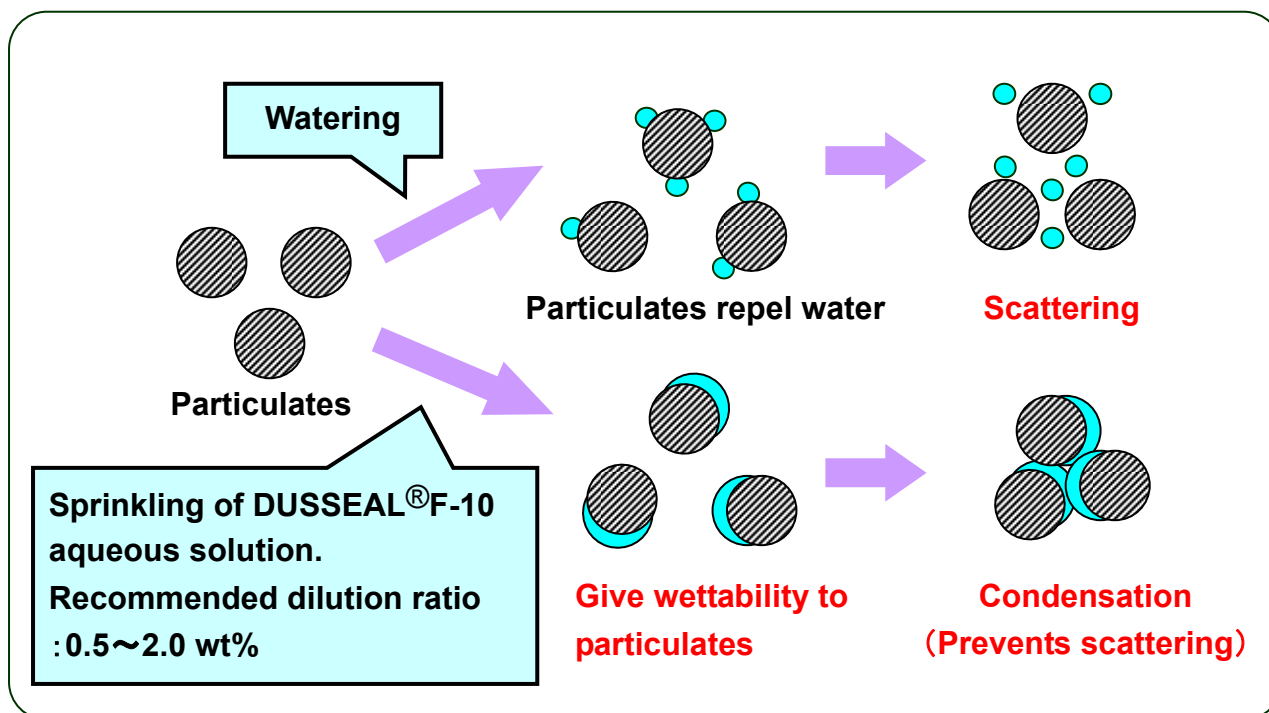
Features

- Coal dust control
- Good water retentivity
- Easy to handle
- Excellent water solubility

Main Application

- Dust control of coal, coal coke, oil coke and other particulates.
- Spontaneous combustion control of coal.

Effecting Mechanism of DUSSEAL®F -10



19.DEFOAMING AGENT

Product Name	Appearance	Main Application	Solubility In water	Cloud Point (°C)	Freezing Point (°C)
DISFOAM [®] BF-33	Liquid	Aqueous high molecular solution	Dispersion	—	* 0 ↓
DISFOAM [®] BC-51Y	Liquid	Fermentation			0
DISFOAM [®] CA-104C	Liquid	PVA, PEO, Acryl	Insoluble	0 ↓	0 ↓
DISFOAM [®] CA-123		Fermentation, Glutamic Acid, Antibiotics	Dispersion	9	-20 ↓
DISFOAM [®] CA-220		Fermentation		18	* -30 ↓
DISFOAM [®] CA-330		Fermentation		12	
DISFOAM [®] CB-442	Liquid	Fermentation, Aqueous high molecular solution, Antibiotics		15	* 0 ↓
DISFOAM [®] CC-118	Liquid	Sewage Disposal, Stock Breeding, Fermentation (Yeast), Water Treatment	Dispersion	5	-5 ↓
DISFOAM [®] CC-218		Drain Treatment		23	* -10 ↓
DISFOAM [®] CC-222		Fermentation, Carbonic Acid Absorbent, Aqueous high molecular solution		20	-10 ↓
DISFOAM [®] CC-438		Fermentation, CO ₂ Gas, Aqueous high molecular solution		18	
DISFOAM [®] CD-432	Liquid	Paper Making	25		
DISFOAM [®] CE-457	Liquid	PVA, Starch, HPC, HMPC	15	-10 ↓	
DISFOAM [®] CK-140	Liquid	Latex, CO ₂ absorption solution, Aqueous high molecular solution	Soluble	48	0 ↓
DISFOAM [®] EMF-607	Liquid	Sewage Disposal, Stock Breeding, Water Treatment	Emulsification	0 ↓	-10 ↓
DISFOAM [®] NQH-7403	Liquid	Medium, Antibiotics	Insoluble	0 ↓	* 0 ↓
DISFOAM [®] FD-2	Liquid	Food Product (Food Additive)	Dispersion	3	—
DISFOAM [®] FDS-2224	Liquid	Paper Making, Slate, Water Treatment, Fermentation	Dispersion	0 ↓	* -7
DISFOAM [®] NKL-5450					-10

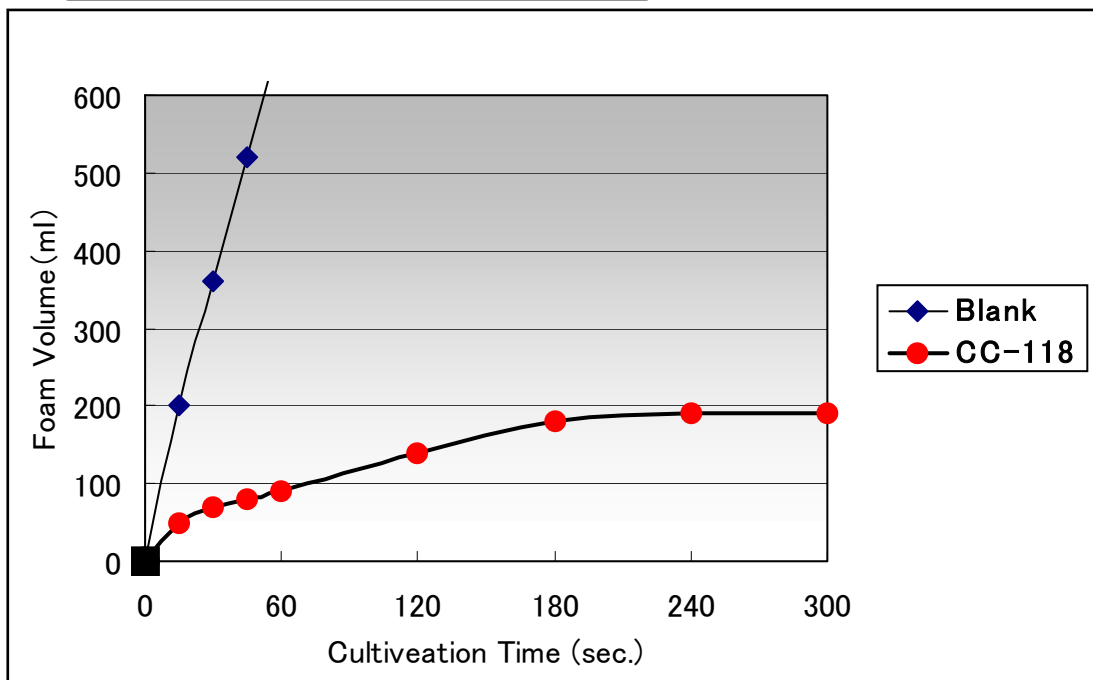
* Pour Point

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1/31/2012

Test Method (Disfoaming Agent)



- 0.01%surfactant(Polyoxyethylene isotridecyl ether HLB=13)aqueous 200 ml be in a graduated cylinder of 1 liter and keep it 25 degrees Celsius. Add "antifoaming agent" 200ppm; blew air of 500ml/min from a diffuser stone and measured the height of bubble.

Effect to defoam

Temperature	
State of the antifoaming agent	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px;">← CLEAR →</div> <div style="border: 1px solid black; padding: 5px; background-color: #f4a460;">← CLOUDY →</div> <div style="border: 1px solid black; padding: 5px; background-color: #ffff00;">← SEPARATION →</div> </div>
Antifoaming effect	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">×</div> <div style="text-align: center;">◎</div> <div style="text-align: center;">○</div> </div>

- The antifoaming agent is water-soluble in lower than clouding point. The antifoaming agent is non-water-soluble in higher than clouding point.
- At the temperature that 5~25 degrees Celsius is higher than "a clouding point", defoamer disperse moderately and shows a high effect to defoam.

20.ANTISTATIC AGENT

20.1 SURFACE COATING TYPE

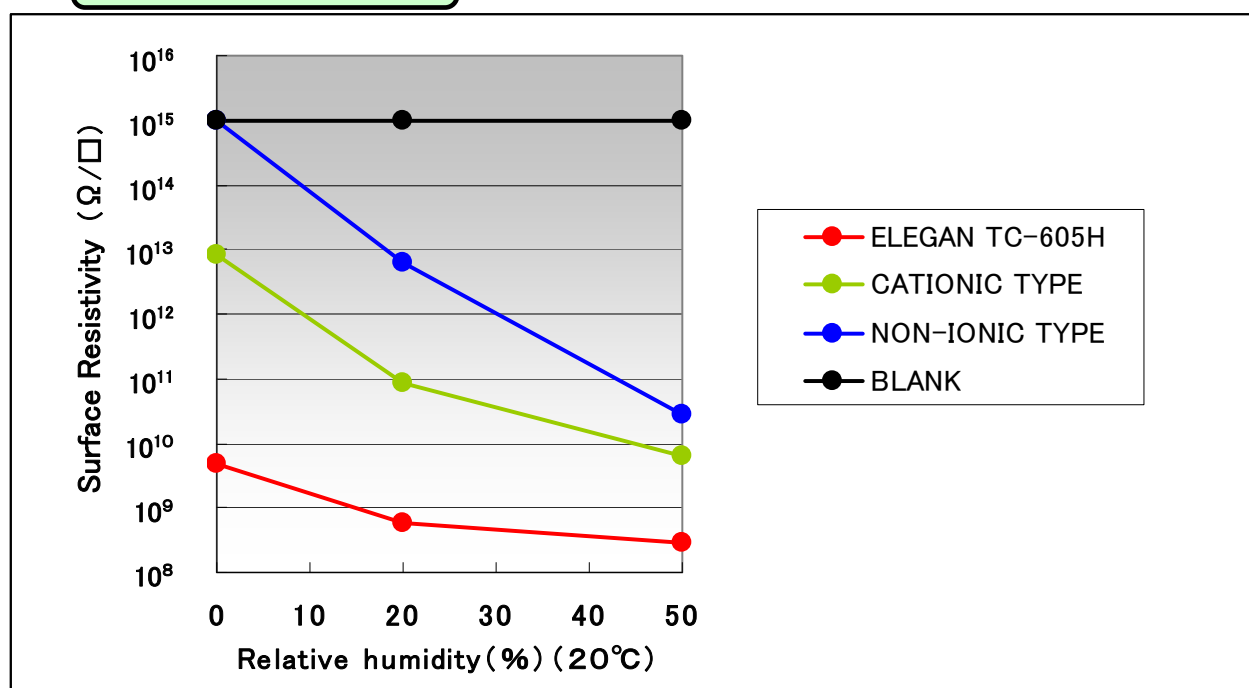
Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/\square) [20°C, Humidity 50%]	Dilution Agent	Flash Point (°C)
ELEGAN [®] 264-30	Light Yellow Liquid	Cationic (Halogen -Free)	1.6×10^8 (x 30 Dilution with water)	Water	No existence
ELEGAN [®] 264WAX	White~Light Yellow Viscous Paste		1.6×10^8 (x 100 Dilution with water)	Industrial Pure Materials	175
ELEGAN [®] TA-100	Light Yellow Liquid	Anionic	7.4×10^8 (x 60 Dilution with water)	Water	No existence

20.2 SURFACE COATING TYPE

Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/\square) [20°C, Humidity 50%]	Dilution Agent	Flash Point (°C)
ELEGAN [®] TC-605	Light Yellow Liquid	Cationic (Halogen -Free)	4.2×10^8 (x 20 Dilution with water)	Water	No existence
ELEGAN [®] TC-605H ※	Light Yellow Liquid		2.4×10^8 (x 20 Dilution with water)	Water	No existence

※Manufactured-by-Order

Effect of ELEGAN



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20.3 MASTER BATCH TYPE (For Flexible PVC)

Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/\square) [20°C, Humidity 50%]	Dilution Agent	Melting Point (°C)
NEW ELEGAN [®] A	Yellow~Dark Brown Liquid (Solid in Winter)	Cationic	Flexible PVC 0.3% added 3.3×10^{10} Flexible PVC 0.6% added 1.8×10^{10}	IPA (30~40%)	—
NEW ELEGAN [®] AI	Yellow~Dark Brown		Flexible PVC 0.3% added 4.6×10^{10} Flexible PVC 0.6% added 2.2×10^{10}		—10 ↓ (Pour Point)
NEW ELEGAN [®] C	Liquid		Flexible PVC 0.6% added 3.0×10^{10} Flexible PVC 1.0% added 6.0×10^{11}	IPA (25%)	—
ELEGAN [®] LD-204	Clear~Light Yellow Liquid		Flexible PVC 1.0% added 8.0×10^{11}	Industrial Pure Materials	—5 ↓ (Pour Point)
NEW ELEGAN [®] ASK	Light Yellow Powder		Flexible PVC 0.3% added 3.2×10^{10} Flexible PVC 0.6% added 1.9×10^{10}	PVC (22%)	60
FARPACK [™] Z-MK	Light Yellow Powder	—	Flexible PVC 1.0% added 4.0×10^{11}	Industrial Pure Materials	Approx.70

20.4 MASTER BATCH TYPE (For PS, ABS, EVA)

Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/\square) [20°C, Humidity 50%]	Dilution Agent	Melting Point (°C)
FARPACK [™] Z-MK	Light Yellow Powder	—	ABS 1.0% added 5.0×10^{11} EVA 0.5% added 2.0×10^{10}	Industrial Pure Materials	Approx.70
ELEGAN [®] A-102			ABS 1.0% added 2.0×10^{11}	Industrial Pure Materials	Approx.60
ELEGAN [®] A-2000SG	Light Yellow Bead	Anionic	GPPS 2.0% added 2.0×10^{10}	Industrial Pure Materials	—

20.5 MASTER BATCH TYPE (For Rubber, Acrylic resin, Polyurethane)

Product Name	Appearance	Ionicity	Main Use	Dilution Agent	Pour Point (°C)
ELEGAN [®] 264WAX	White~Light Yellow Viscous Paste	Cationic (Halogen -Free)	For Ink, Polyurethane, Acrylic resin	Industrial Pure Materials	50~55
ELEGAN [®] 264WE	Yellow Liquid		For Polyurethane	Ethylene glycol (17%)	—
ELEGAN [®] C-606 ※	Light Yellow Viscous Liquid	Cationic	For Rubber, Acrylic resin	Industrial Pure Materials	—

※Manufactured-by-Order

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