COMPREHENSIVE CATALOGUE

Oleo & Speciality Chemicals Divsion

NOF CORPORATION

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Trade Name Index

Trade Name Index

1.FATTY ACID

1. 1 SATURATED FATTY ACID (Typical specifications)

Ingredient	Product Name	Appearance	Neutralization Value	Iodine Value	Color (APHA)	Melting Point (℃)
CAPROIC ACID	NAA®−60	Liquid	425～483	7↓	—	Approx.−3 (Freezing Point)
CAPRYLIC ACID	NAA®−82	Liquid	382～390	0.5↓	120↓	16.7
CAPRIC ACID	NAA®−102	Solid	323～327	0.5↓	120↓	31.5
LAURIC ACID	NAA®−122	Beads	278～282	0.5↓	120↓	Approx.43
	NAA®−312	Solid (20℃)	277～283	1.0↓	150↓	32～36
	1214 FATTY ACID	Solid	269～273	0.5↓	120↓	32～39 (Freezing Point)
	COCONUT FATTY ACID	Solid (20℃)	260～270	10↓	300↓	23～27 (Freezing Point)
MYRISTIC ACID	NAA®−142	Beads	242～248	0.5↓	120↓	45～56
PALMITIC ACID	NAA®−160	Beads	215～220	1↓	120↓	Approx.60
	NAA®−171	Beads	209.5～215.5	2↓	120↓	52～57
(SPECIAL) STEARIC ACID	NAA®−180	Beads	195～206	2↓	80↓	65～69
	NAA®−173K	Beads	195～206	2↓	100↓	65～69
	NAA®−173K POWDER	Powder				
	NAA®−175	Beads	204～210	0.5↓	100↓	54～58
	NAA®−176	Beads	207～212	0.5↓	100↓	54～57
STEARIC ACID	STEARIC ACID CHERRY	Beads	197～207	0.5↓	100↓	59～61
		Powder				
		Fine Powder				
	STEARIC ACID CAMELLIA	Beads	197～207	4↓	6↓ (Gardner)	57～60
		Powder				
	STEARIC ACID (B00)	Stick	—	—	—	50～60
BEHENIC ACID	NAA®−222S	Beads	161～169	3↓	120↓	74～78
		Powder				

1. 2 SATURATED FATTY ACID (Fatty acid composition)

Ingredient	Product Name	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							
	NAA®−312			10	75	15							
	1214 FATTY ACID			0.5	75	24.5							
	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®−173K POWDER												
	NAA®−175					4	43	52	1				
	NAA®−176					3	50	47					
STEARIC ACID	STEARIC ACID CHERRY (Beads)					2	31	66	1				
	STEARIC ACID CHERRY (Powder)												
	STEARIC ACID CHERRY (Fine Powder)												
	STEARIC ACID CAMELLIA (Beads)					3	32	63	1	1			
	STEARIC ACID CAMELLIA (Powder)												
	STEARIC ACID (BOO)	ϕ66mm×H208mm (25/Set)											
BEHENIC ACID	NAA®−222S BEADS					13				85	2		
	NAA®−222S POWDER												

3/24/2017

1. 3 UNSATURATED ACID (Typical specificiations)

Ingredient	Product Name	Unsaturated Acid (%)	Appearance	Neutralization Value	Iodine Value	Color (APHA)	Freezing Point (℃)
OLEIC ACID	NAA®－35	89	Light Yellow Viscous Liquid	196～205	85～95	8↓ (Gardner)	8↓
	NAA®－34	90		198～205	87～93	260↓	8↓
	EXTRA OLEIN	92		198～204	86～91	100↓	7↓
	EXTRA OS−**85**	92		195～204 (Acid Value)	80～95	80↓	15↓
ERUCIC ACID	ERUCIC ACID	88↑	Light Yellow Solid	158～168	71～81	200↓	25～35

1. 4 OTHER FATTY ACID (Typical specifications)

Ingredient	Product Name	Appearance	Neutralization Value	Iodine Value	Color (APHA)	Melting Point (℃)
TALLOW FATTY ACID	TALLOW FATTY ACID No.0	Yellow Solid	200～208	51～63	6↓ (Gardner)	38～44
	TALLOW FATTY ACID No.1	Yellow Solid	197～207	45～53	6↓ (Gardner)	40～44
HARDENED TALLOW FATTY ACID	HARDENED TALLOW FATTY ACID 45° HFA	Light Yellow Solid	202～207	38～46	120↓	Approx.45
	HARDENED TALLOW FATTY ACID 51°	Light Yellow Flake	197～207	28↓	3↓ (Gardner)	Approx.51
FATTY ACID for SOAP	FATTY ACID FOR SOAP	Light Yellow Solid	212～225	34～38	120↓	39～44
	FAK-2 (for Soap)	Light Yellow Solid	220～230	31～39	100↓	Approx.40
	FAK-4 (for Soap)	Light Yellow Solid	205～225	29～44	100↓	39～46
HYDROGENATED CASTOR OIL FATTY ACID	HYDROGENATED CASTOR OIL FATTY ACID(12-Hydroxystearic Acid)	White Flake	178～187	6↓	—	64～74

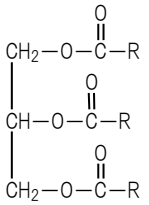
1. 5 OTHER FATTY ACID (Fatty acid composition)

Product Name	Saturated acid (%)					Unsaturated acid (%)		
	C12	C14	C16	C18	C20	C16	C18	C18
TALLOW FATTY ACID No.0		2	22	22		2	35	12
TALLOW FATTY ACID No.1		3	24	25		4	35	8
HARDENED TALLOW FATTY ACID 45° HFA		3	25	23		4	40	1
HARDENED TALLOW FATTY ACID 51°		3	42	40			10	2
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

2. FATTY ACID TRIGLYCERIDE

2. 1 MEDIUM CHAIN FATTY ACID TRIGLYCERIDE

Product Name	Appearance	Chemical Name	Structural Formula	Kinematic Viscosity (40℃) (mm^2/s)	Freezing Point (℃)
PANACET®800B	Light Yellow Liquid	2-Ethylhexyl triglyceride	 800B R=$C_4H_8CH(C_2H_5)$ 810 R=C_7H_{15} R=C_9H_{19}	—	−5 ↓
PANACET®810 PANACET®810S PANACET®810S (JPE) (Food Lubricating Agent)	Clear～Light Yellow Liquid	Caprylic / Capric acid -triglyceride		13	0 ↓

(JPE) Japanese Pharmaceutical Excipients

2. 2 TALLOW HARDENED OIL (Typical specifications)

Ingredient	Product Name	Appearance	Saponification Value	Acid Value	Iodine Value	Color (APHA)	Melting Point (℃)
TALLOW HARDENED OIL	TALLOW HARDENED OIL 51° HO	Flake	190～200	2 ↓	32 ↓	150 ↓	Approx.50
	TALLOW HARDENED OIL 54° HO				25 ↓	200 ↓	Approx.54
	TALLOW HARDENED OIL EXTREMELY HARD				2 ↓	140 ↓	58～62
HYDROGENATED CASTOR OIL	CASTER WAX FLAKE	Flake	176～187	2 ↓	2.5 ↓	—	85 ↑

2. 3 TALLOW HARDENED OIL (Fatty acid composition)

Product Name	Saturated acid (%)						Unsaturated acid (%)	
	C10	C12	C14	C16	C18	C20	C16	C18
TALLOW HARDENED OIL 51° HO	1	1	4	27	34	3	3	30
TALLOW HARDENED OIL 54° HO	1	1	4	27	44	3	3	20
TALLOW HARDENED OIL EXTREMELY HARD	1	1	4	30	63			1
CASTER WAX FLAKE				2	12 ∗(83)	1		∗(2)

∗Contains a Hydroxyl Group

3.GLYCERIN & HIGHER ALCOHOL

3. 1 INDUSTRIAL GRADE

Product Name	Glycerin (%)	Density (20℃)	Color (Hazen No.)	Acidity or Alkalinity (meq/100g)	Chloride Test	Reducing Matter	Ash (%)
D G (DYNAMITE GLYCERIN)	98.5↑	1.257↑	30↓	0.3↓	Pass	Pass	0.05↓
R G (REFINED GLYCERIN)	98.5↑	1.257↑	10↓	0.3↓	Pass	Pass	0.05↓
GLYCERIN 85	84～87	1.221～1.230	10↓	—	—	—	0.03↓

3. 2 FOOD ADDITIVE GRADE

Product Name	Glycerin (%)	Specific Gravity (20/20℃)	Heavy Metals (μg/g)	Arsenic (μg/g)	Chloride (Cl %)	Reducing Matter	Residue on Ignition (%)
FOOD ADDITIVE GLYCERIN	98.5↑	1.260～1.264	5.0↓	2.0↓	0.003↓	Pass	0.01↓

3. 3 FEED GRADE

Product Name	Glycerin (%)	Specific Gravity (20/20℃)	Heavy Metals (ppm)	Arsenic (ppm)	Chloride (Cl %)	Reducing Matter	Residue on Ignition (%)
FEED GRADE GLYCERIN	98.5↑	1.260↑	5.0↓	2.0↓	0.001↓	Pass	0.01↓

3. 4 COSMETICS-GRADE

Product Name	Glycerin (%)	Specific Gravity (20/20℃)	Heavy Metals (ppm)	Arsenic (ppm)	Chloride (Cl %)	Sulfate	Residue on Ignition (%)
RG･CO･	95.0↑	1.251↑	5.0↓	2↓	0.0013↓	Pass	0.01↓
GLYCERIN 85 for cosme	84～87	1.221～1.230	5.0↓	2↓	0.0013↓	Pass	0.01↓

3. 5 JAPANESE PHARMACOPOEIA GRADE

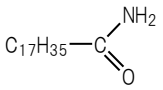
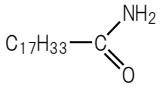
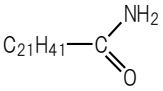
Product Name	Glycerin (%)	Specific Gravity (20/20℃)	Heavy Metals (ppm)	Arsenic (ppm)	Chloride as NaCl (%)	Sulfate (%)	Residue on Ignition (%)
CONCENTRATED GLYCERIN	98.0～101.0	1.258↑	5↓	2↓	0.001↓	0.002↓	0.01↓
GLYCERIN PG	84.0～87.0	1.221～1.230	5↓	2↓	0.001↓	0.002↓	0.01↓

3. 6 HIGHER ALCOHOL

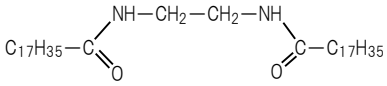
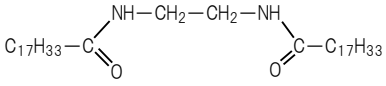
Ingredient	Product Name	Appearance	Hydroxyl Value	Saponnification Value	Iodine Value	Melting Point (℃)	Saturated alcohol (%)				
							C10	C12	C14	C16	C18
LAURYL ALCOHOL	**NAA®－42**	White Solid	294～304	1↓	0.1↓	Approx.24	2	95	3		
MYRISTYL ALCOHOL	**NAA®－43**	White Solid	254～264	2↓	0.1↓	Approx.38		2	95	3	
CETYL ALCOHOL	**NAA®－44**	White Beads	220～235	1↓	1↓	48～53			2	95	3
STEARYL ALCOHOL	**NAA®－45**	White Beads	200～220	1↓	1↓	Approx.59				5	95
	NAA®－46	White Beads	200～225	2↓	1↓	55～60				15	85
CETEARYL ALCOHOL	**NAA®－48**	White Beads	205～230	2↓	1↓	51～56				50	50

4.FATTY ACID AMIDE

4. 1　MONO AMIDE

Product Name	Appearance (Average particle size)	Chemical Name	Structural Formula	Amine Value	Melting Point C.MP (℃)
ALFLOW®S-10	White Beads (300μm)	Stearamide		—	100～105
ALFLOW®E-10	White Beads (300μm)	Oleylamide		—	72～76
ALFLOW®P-10	White Beads (300μm)	Erucamide		—	79～84

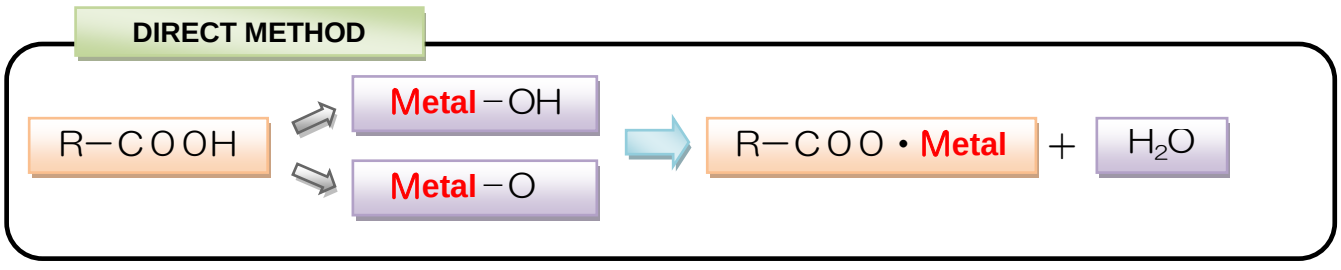
4. 2　BIS AMIDE

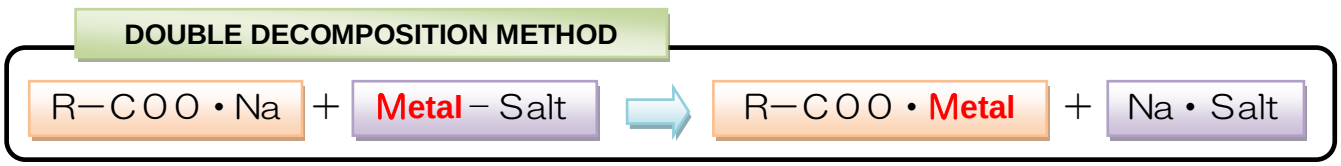
Product Name	Appearance	Average particle size	Chemical Name / Structural Formula	Amine Value	Melting Point C.MP (℃)
ALFLOW®H-50L	Pale Yellow Beads	0.5～1mm	Ethylene bis stearamide 	3↓	140～145
ALFLOW®H-50S	Pale Yellow Beads	200μm		3↓	
ALFLOW®H-50SN (Smoll-lot production)				5～7	
ALFLOW®H-50SJ (Smoll-lot production)				10～14	
ALFLOW®H-50F	Pale Yellow Beads	50μm		—	
ALFLOW®H-50T	Pale Yellow Fine Powder	40μm		3↓	
ALFLOW®H-50P	Pale Yellow Fine Powder	25μm		3↓	
ALFLOW®H-50TF	Pale Yellow Fine Powder	18μm		3↓	
ALFLOW®H-50TF-S	Pale Yellow Fine Powder	12μm		3↓	
ALFLOW®H-50U (Smoll-lot production)	Pale Yellow Fine Powder	7μm		2↓	
ALFLOW®H-50UF (Smoll-lot production)	Pale Yellow Fine Powder	3μm		2↓	
ALFLOW®H-50ES ALFLOW®H-50ES-P	White Emulsified Liquid	Aqueous dispersion Active ingredient:42%		—	—
ALFLOW®AD-281F	Pale Yellow Beads	1mm	Ethylene bis oleylamide 	8↓	Approx.115
ALFLOW®AD-281P (Smoll-lot production)	Pale Yellow Powde	500μm			

5.METALLIC SOAP

5. 1 DIRECT METHOD

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Free Fatty Acid (%)	Melting Point C.MP (℃)
CALCIUM STEARATE G	Granule	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Ca	3.0↓	6.5～7.5	1.0↓	145～160
CALCIUM STEARATE GP	Powder					
CALCIUM STEARATE GF-200	Fine Powder					
ZINC LAURATE G	Granule	$C_{11}H_{23}COO$ / $C_{11}H_{23}COO$ > Zn	1.0↓	12.0～14.0	0.5↓	125～140
ZINC LAURATE GP	Powder					
ZINC STEARATE G	Granule	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Zn	0.8↓	10.5～11.5	0.5↓	116～125
ZINC STEARATE GP	Powder					
ZINC STEARATE GF-200	Fine Powder					
ZINC BEHENATE ※Production by Order	Powder	$C_{21}H_{43}COO$ / $C_{21}H_{43}COO$ > Zn	0.5↓	8.2～9.2	1.0↓	125～135
MAGNESIUM STEARATE G	Granule	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Mg	6.0↓	4.0～4.8	1.0↓	120～140
MAGNESIUM STEARATE GR	Granule					
MAGNESIUM STEARATE GP	Powder					
MAGNESIUM STEARATE GF-200	Fine Powder					





5. 2 DOUBLE DECOMPOSITION METHOD

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Free Fatty Acid (%)	Melting Point C.MP (℃)
CALCIUM STEARATE	Fine Powder	$C_{17}H_{35}COO$ > Ca, $C_{17}H_{35}COO$	3.0 ↓	6.5～7.0	0.5 ↓	150～165
CALCIUM STEARATE S			2.0 ↓	6.4～6.8	0.5 ↓	148～160
CALCIUM STEARATE FX (For Resin Coated Sand)			3.0 ↓	6.5～7.0	0.5 ↓	150～165
CALCIUM LAURATE ※Production by Order		$C_{11}H_{23}COO$ > Ca, $C_{11}H_{23}COO$	5.0 ↓	8.4～9.4	1.0 ↓	140～160
CALCIUM CASTOR STEARATE (Smoll-lot production)		RCOO > Ca, RCOO; RCOO=12-Hydroxy Stearic Acid	3.0 ↓	6.0～7.0	1.0 ↓	140～160
POWDER BASE L (ZINC LAURATE)	Fine Powder	$C_{11}H_{23}COO$ > Zn, $C_{11}H_{23}COO$	—	13.2～14.2	0.5 ↓	123～130
POWDER BASE M (ZINC MYRISTATE)		$C_{13}H_{27}COO$ > Zn, $C_{13}H_{27}COO$	—	12.2～13.2	0.5 ↓	123～130
ZINC STEARATE		$C_{17}H_{35}COO$ > Zn, $C_{17}H_{35}COO$	0.8 ↓	10.5～11.3	0.5 ↓	116～124
ZINC STEARATE S			0.5 ↓	10.5～11.3	0.5 ↓	116～124
MAGNESIUM STEARATE	Fine Powder	$C_{17}H_{35}COO$ > Mg, $C_{17}H_{35}COO$	4.0 ↓	4.0～4.5	1.0 ↓	110～135
ALUMINUM STEARATE 300	Fine Powder	$C_{17}H_{35}COO$, HO > Al, HO	1.5 ↓	10.0～11.5 (Ash)	8.0 ↓	150～165
ALUMINUM STEARATE 600		$C_{17}H_{35}COO$, HO > Al, $C_{17}H_{35}COO$	1.5 ↓	8.5～10.0 (Ash)	12.0 ↓	140～155
ALUMINUM STEARATE 900		$C_{17}H_{35}COO$, $C_{17}H_{35}COO$ > Al, $C_{17}H_{35}COO$	1.5 ↓	6.5～8.0 (Ash)	20～30	110～125

5. 3 JAPANESE PHARMACOPOEIA GRADE

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Free Fatty Acid (%)	Melting Point C.MP (℃)
CALCIUM STEARATE (JP)	Fine Powder	$C_{17}H_{35}COO$ > Ca, $C_{17}H_{35}COO$	3.0 ↓	6.5～7.0	0.5 ↓	150～165
MAGNESIUM STEARATE (JP)	Fine Powder	$C_{17}H_{35}COO$ > Mg, $C_{17}H_{35}COO$	6.0 ↓	4.0～5.0	1.0 ↓	—

5. 4 FOOD ADDITIVE GRADE

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	Free Fatty Acid (%)	Melting Point C.MP (℃)
AULABRITE®CA-65 (Food Additive)	Fine Powder	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Ca	4.0 ↓	6.4～7.1	—	150～165
AULABRITE®MA-76 (Food Additive)	Fine Powder	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Mg	6.0 ↓	4.0～5.0	—	—

Moisture absorption test for candy

BLANK	Dosage 0.1wt%	Dosage 0.3wt%
moisture content 1.8%	moisture content 1.3%	moisture content 1.1%

Accelerated test after 2 hours（40℃・75%RH）
（AULABRITE®CA-65）

5. 5 NEUTRAL TYPE

Product Name	Appearance	Structural Formula	Moisture (%)	Metal Content (%)	pH(2%aq.) (Dispersion)	Melting Point C.MP (℃)
AULABRITE®NC	Fine Powder	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Ca	3.0 ↓	6.0～7.0	6～7	155～165
AULABRITE®NM ※Under development	Fine Powder	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Mg	4.0 ↓	4.0～4.5	6～7	110～135

Characteristic

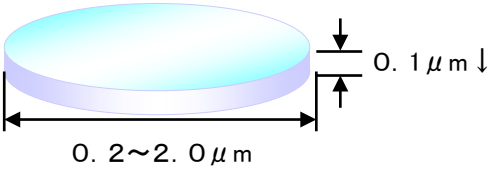
- ***Temporal Xanthosis Restraint of Resin***
  AULABRITE® presents neutrality (pH =6-7 degree).It prevent inhibition action for the additives such as antioxidants and so on, and restrain xanthosis of resin.
- ***Decomposition Restraint of Resin***
  We can use AULABRITE® as color dispersant of the polyesters, 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.

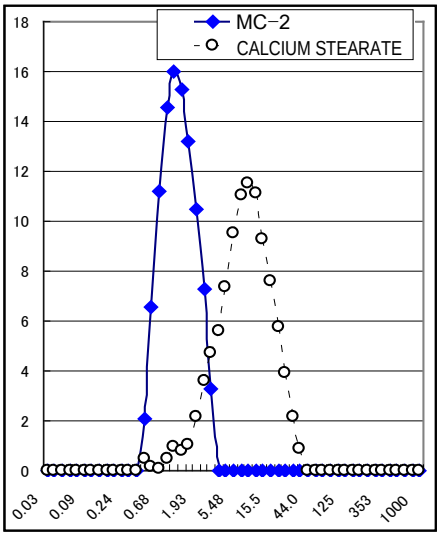
5. 6 HYPERFINE PARTICLES TYPE

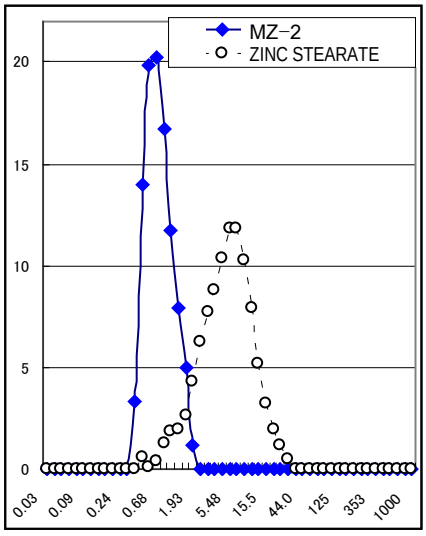
Product Name	Appearance (Average Particle Size)	Structural Formula	Moisture (%)	Metal Content (%)	Free Fatty Acid (%)	Melting Point C.MP (℃)
MC-2	Fine Powder (2μm↓)	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Ca	3.0↓	6.0～7.0	0.5↓	155～165
MZ-2	Fine Powder (1.5μm↓)	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Zn	0.5↓	10.0～11.0	0.5↓	125～135
MM-2	Fine Powder (3μm↓)	$C_{17}H_{35}COO$ / $C_{17}H_{35}COO$ > Mg	8.0↓	4.0～5.0	0.5↓	110～135

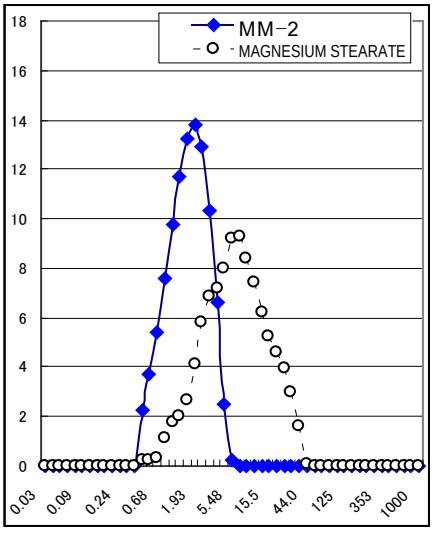
Characteristic

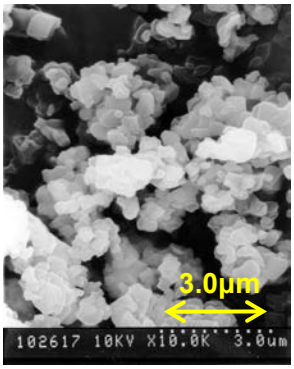
- Average particle size **3.0μm↓**
- Narrow particle size distribution of this product



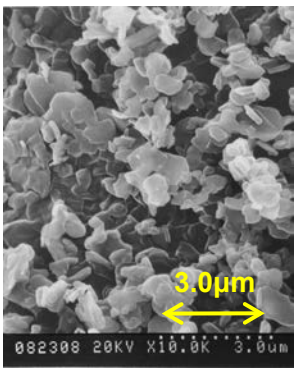




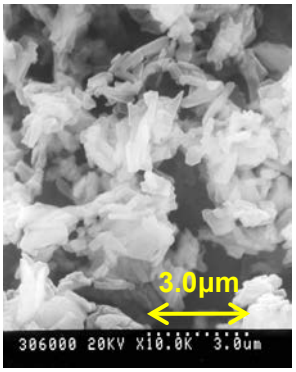




MC-2



MZ-2

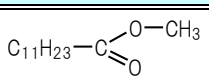
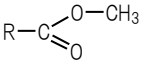
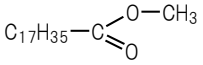
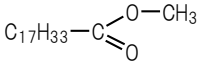


MM-2

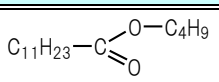
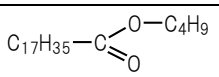
3/24/2017

6.ESTERS

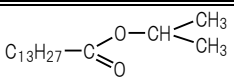
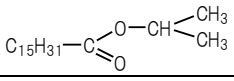
6. 1 METHYL ESTER

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
METHYL LAURATE 95	Clear Liquid	Methyl laurate		Approx.7
ME-175 (Smoll-lot production)	Light Yellow Liquid in Summer Light Yellow Solid in Winter	Hardened tallow fatty acid -methyl ester		27～29 (Melting Point)
METHYL STEARATE 95	Light Yellow Solid	Methyl stearate		39 (Melting Point)
UNISTER®M-182A	Light Yellow Liquid	Methyl oleate		0↓

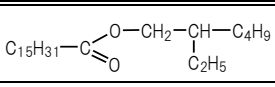
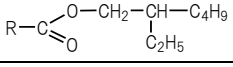
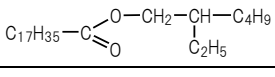
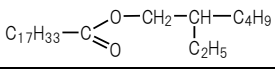
6. 2 BUTYL ESTER

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
BUTYL LAURATE (Smoll-lot production)	Yellow Liquid	Butyl laurate		-13～-16
BUTYL STEARATE	Light Yellow Solid	Butyl stearate		23 (Melting Point)

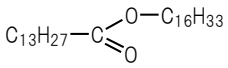
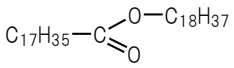
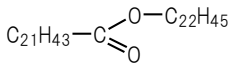
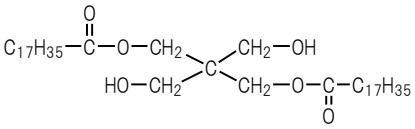
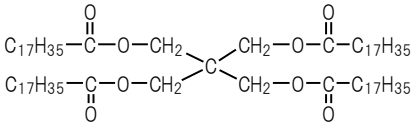
6. 3 ISOPROPYL ESTER

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
IPM-R	Clear Liquid	Isopropyl myristate		3～9
IPP-R	Clear Liquid	Isopropyl palmitate		11

6. 4 2-ETHYLHEXYL ESTER

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
UNISTER®MB-816	Light Yellow Liquid	2-Ethylhexyl palmitate		0 (Pour Point)
UNISTER®MB-871	Light Yellow Liquid	2-Ethylhexyl fatty acid ester		Approx.1
UNISTER®MB-876	Light Yellow Liquid	2-Ethylhexyl stearate		Approx.10
UNISTER®MB-881	Light Yellow Viscous Liquid	2-Ethylhexyl oleate		-40 (Pour Point)

6. 5 LONG CHAIN SOLID TYPE ESTER

Product Name	Appearance	Chemical Name	Structural Formula	Melting Point (℃)
Spermaceti	White Flake	Cetyl myristate		Approx.50
UNISTER®M-9676	Light Yellow Flake	Stearyl stearate		52～58
UNISTER®M-2222SL	Whilte Powder	Behenyl behenate		Approx.70
UNISTER®H-476D	White Flake	Pentaerythritol distearate		Approx.53
UNISTER®H-476	White Flake	Pentaerythritol tetra-stearate		60～65
WE-476-H	Beads			

6. 6 HIGH-PURIFIED SOLID TYPE ESTER (Typical specifications)

Product Name	Appearance	Acid Value (mgKOH/g)	Hydroxyl Value	Residue on Drying (%)	Color (Gardner)	Melting Point C.MP (℃)
WEP-2	Beads	0.1	4.0↓	0.1～0.3	1	60±1
WEP-3		0.1	4.0↓		1	73±1
WEP-4		0.1	4.0↓		1	71±1
WEP-5		0.1	4.0↓		1	82±1
WEP-6		0.1	4.0↓		1	77±1
WEP-7		0.1	8.0↓		2	70±1
WEP-8		0.1	4.0↓		1	79±1
WEP-9		0.5	—		9	80±1
WEP-10		0.1	4.0↓		1	69±1

Characteristic

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.

6. 7　POLYOL ESTER for LUBLICATING OIL (Typical specifications) (1)

Product Name	Acid Value (mgKOH/g)	Flash Point (℃)	Kinematic Viscosity (mm^2/s)		Viscosity Index	Pour Point (℃)
			40℃	100℃		
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®HP-281R	0.1	278	24.1	5.9	206	−30
UNISTER®H-334R	0.1	261	19.6	4.4	140	−40
UNISTER®H-327R	0.1	265	20.4	4.5	138	−45
UNISTER®H-310R (Smoll-lot production)	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 (Smoll-lot production)	0.2	284	33.7	6.7	160	0
UNISTER®H-330 ※Production by Order	3.3	280	38.2	7.1	152	−5
UNISTER®H-385	2.2	277	46.7	9.2	184	−5
UNISTER®H-385R ※Production by Order	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-481T (Smoll-lot production)	1.6	310	76.2	12.4	162	−27.5
UNISTER®H-481D	1.5	286	130	14.9	116	−27.5
UNISTER®G-1027 ※Production by Order	0.1	258	16.0	3.8	136	−5
UNISTER®HR-20B	0.1	266	19.4	4.9	190	−17.5
UNISTER®HR-22 ※Production by Order	0.1	244	22.1	4.7	135	−35

6. 8 POLYOL ESTER for LUBLICATING OIL (Typical specifications) (2)

Product Name	Acid Value (mgKOH/g)	Flash Point (℃)	Kinematic Viscosity (mm^2/s)		Viscosity Index	Pour Point (℃)
			40℃	100℃		
UNISTER®HR-32	0.1↓	273	33.5	5.8	114	-50
UNISTER®HR-46 ※Production by Order	0.1	272	45.5	7.4	130	-42.5
UNISTER®HR-64 (Smoll-lot production)	0.1	283	64.8	9.0	113	-37.5
UNISTER®HR-170R (Smoll-lot production)	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

6. 9 MONO ESTER for LUBURICANTING OIL (Typical specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (℃)	Kinematic Viscosity (mm^2/s)		Viscosity Index	Pour Point (℃)
			40℃	100℃		
UNISTER®MB-408B ※Production by Order	0.1↓	104	1.5	0.7	—	-50
UNISTER®MB-808B	0.1↓	138	2.7	1.1	—	-50
UNISTER®M-114	0.2	158	3.3	1.3	—	17.5
UNISTER®M-182A	0.2	183	4.4	1.8	—	0↓ (Freezing Point)
UNISTER®M-183	0.4	182	4.9	1.9	—	5
UNISTER®M-480R ※Production by Order	0.1	210	5.9	2.2	221	-40
UNISTER®M-476	0.1	193	6.7	2.4	203	22～23 (Melting Point)
UNISTER®MB-816	0.1	215	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
UNISTER®MB-1381	0.1	254	14.2	3.9	182	-30
UNISTER®D-13BA	0.1	260	22.7	4.9	149	-50↓

6. 10 COMPLEX ESTER (Typical specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (℃)	Kinematic Viscosity (mm^2/s)		Viscosity Index	Pour Point (℃)
			40℃	100℃		
UNISTER®C-3371A	1.7	270	77.4	11.4	141	-47.5
UNISTER®C-3373A	2.8	271	245	29.5	159	-32.5
UNISTER®C-400B ※Production by Order	0.5	308	390	38.9	153	-40
UNISTER®C-6910BE ※Production by Order	4.0	315	557	42.0	122	-25
UNISTER®TOE-500	3.6	284	557	58.9	175	-32.5
UNISTER®TOE-2500	3.6	290	2,622	199	198	-12.5

6. 11 ADDITIVE for KEROSENE POWER GENERATION (For diesel engine)

Product Name	Appearance	Flash Point (℃)	Kinematic Viscosity (40℃) (mm^2/s)	Density (15℃) (g/cm^3)	pH	Pour Point (℃)
LE191A	Colorless～Light Milk-White Liquid	63	617	0.898	—	-21

（**Features**） Fuel leak prevention, Prevention of seizure and wear of fuel injection pump

6. 12 RUST PREVENTIVE LUBRICATING OIL

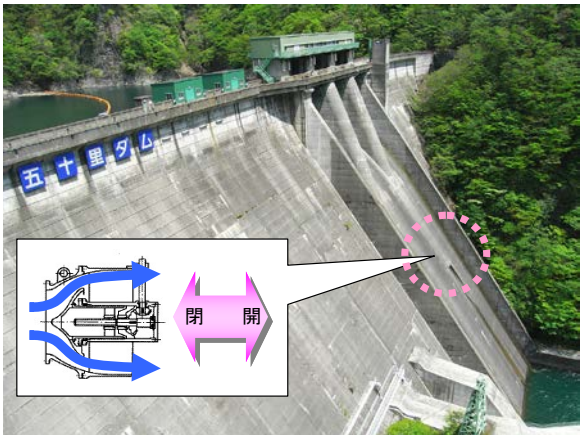
Product Name	Appearance	Active Component (%)	Viscosity (25℃) (mPa･s)	Specific gravity (25℃)	pH	Freezing Point (℃)
MC-560-J （MILBOND）	Milk-White Liquid （Aqueous solution）	25	700～1,000	1.03～1.05	7.5～8.5	0 ↓

6. 13 BIODEGRADABLE HYDRAULIC FLUIDS (Typical specifications)

Product Name	Acid Value (mgKOH/g)	Flash Point (℃)	Kinematic Viscosity (mm^2/s)		Viscosity Index	Pour Point (℃)
			40℃	100℃		
MILLUBE®E-22A (Smoll-lot production)	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	−35

"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.

APPLICATION of MILLUBE®



(FLOODGATE OF DAM)


(WATERWEED CUTTER)


(UNDERWATER BACKHOE)


(PIERLESS FLOODGATE)

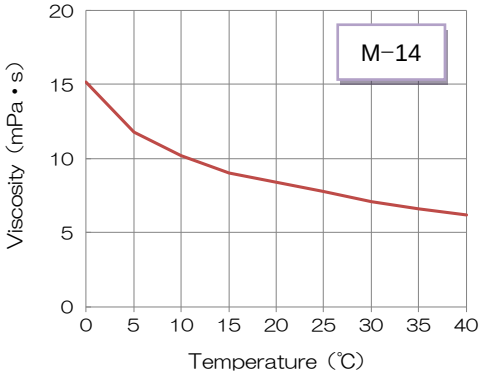
7.AMINE

7. 1 PRIMARY AMINE

Product Name	Appearance	Chemical Name	Structural Formula	Total Amine Value	Freezing Point (℃)
NISSAN AMINE®BB	White Waxy Solid	Dodecylamine	$C_{12}H_{25}—NH_2$	292～306	Approx.28 (Melting Point)
NISSAN AMINE®FB	Dark Brown Liquid in Summer Light Yellow Solid in Winter	Coco-alkylamine	$R—NH_2$	270～290	17
NISSAN AMINE®MB (Smoll-lot production)	White Waxy Solid	Tetradecylamine	$C_{14}H_{29}—NH_2$	253～265	Approx.38
NISSAN AMINE®M-14	Light Yellow Liquid	1-amino-3-undecanoxy -propane	$C_{11}H_{23}O(CH_2)_3-NH_2$	214～244	Approx.-5
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®ABT-2	White Waxy Solid (20℃)	Tallow alkylamine	$R—NH_2$	208～220	30～40
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®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®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-S	White Waxy Solid	Behenylamine	$C_{22}H_{45}—NH_2$	165～185	55～65
NISSAN AMINE®VB-S FLAKE	White～Light Yellow Flake				

Low viscosity and Low freezing point

NISSAN AMINE®M-14
(Freezing Point：Approx.-5)



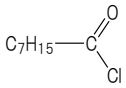
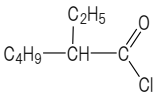
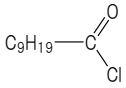
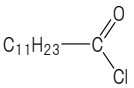
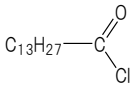
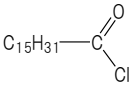
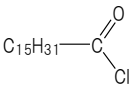
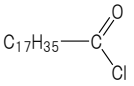
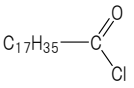
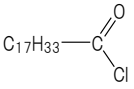
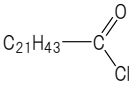
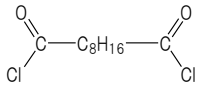
7. 2 TERTIARY AMINE

Product Name	Appearance	Chemical Name	Structural Formula	Total Amine Value	Freezing Point (℃)
TERTIARY NISSAN AMINE®BB	Clear～Light Yellow Liquid	Dodecyl -dimethyl amine	$C_{12}H_{25}-N(CH_3)(CH_3)$	243～266	-15
TERTIARY NISSAN AMINE®FB (Smoll-lot production)	Light Yellow Liquid	Coconut alkyl -dimethyl amine	$R-N(CH_3)(CH_3)$	230～250	-15↓
TERTIARY NISSAN AMINE®MB (Smoll-lot production)	Clear～Light Yellow Liquid	Tetradecyl -dimethyl amine	$C_{14}H_{29}-N(CH_3)(CH_3)$	217～237	-8
TERTIARY NISSAN AMINE®PB (Smoll-lot production)	Clear～Light Yellow Liquid	Hexadecyl -dimethyl amine	$C_{16}H_{33}-N(CH_3)(CH_3)$	190～210	—
TERTIARY NISSAN AMINE®ABT	Dark Brown Liquid in Summer Light Yellow Solid in Winter	Hardened tallow alkyl -dimethyl amine	$R-N(CH_3)(CH_3)$	180～200	18～21
TERTIARY NISSAN AMINE®AB	White～Light Yellow Waxy Solid	Octadecyl -dimethyl amine	$C_{18}H_{37}-N(CH_3)(CH_3)$	170～192	20～23

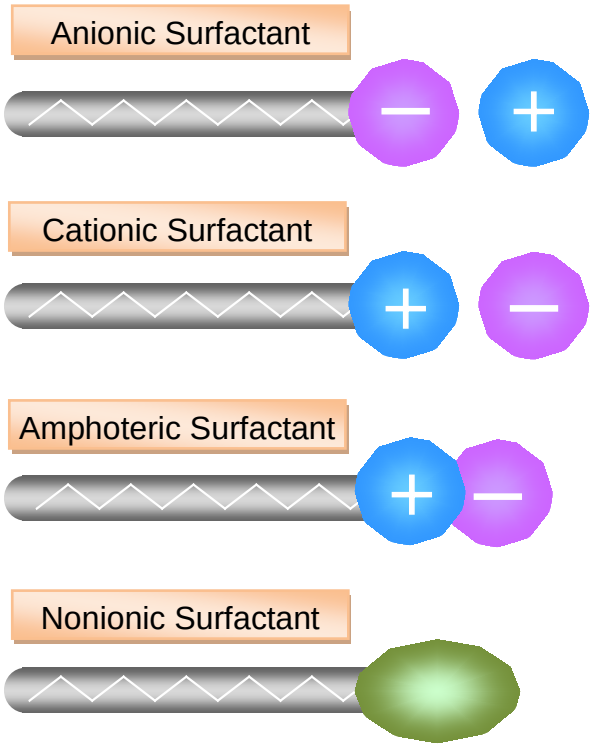
7. 3 DIAMINE

Product Name	Appearance	Chemical Name	Structural Formula	Total Amine Value	Freezing Point (℃)
NISSAN AMINE®DT	Yellow Waxy Solid	Tallow akyl -propylene diamine	$R-NH-C_3H_6-NH_2$	290↑	25～34
NISSAN AMINE®DT-H	Dark Brown Flake	Hardened tallow akyl -propylene diamine		320↑	40～42
NISSAN AMINE®DOB-R	Dark Brown Liquid in Summer Light Yellow Solid in Winter	Oleyl -propylene diamine	$C_{18}H_{35}-NH-C_3H_6-NH_2$	320～350	Approx.20
NISSAN AMINE®DV FLAKE	Dark Brown Flake	Behenyl -propylene diamine	$C_{22}H_{45}-NH-C_3H_6-NH_2$	240～295	61～68

8.FATTY ACID CHLORIDE

Product Name	Appearance	Structural Formula	Chloride (%)	Phosphorus (%)	Free Fatty Acid (%)	Freezing Point (℃)
CAPRYLOYL CHLORIDE ※Under development	Light Yellow Liquid		22.8～25.8	1.5↓	4.0↓	-50↓
DISTILLED 2-ETHYLHEXYL CHLORIDE	Light Yellow Liquid		20.8～22.8	0.1↓	2.5↓	-50↓
CAPRYL CHLORIDE	Light Yellow Liquid		19.3～22.3	1.5↓	3.5↓	-31
LAUROYL CHLORIDE	Light Yellow Liquid		17.5～20.5	1.5↓	4.0↓	-17
MYRISTOYL CHLORIDE	Light Yellow Liquid		15.0～18.0	1.5↓	3.0↓	3
DISTILLED MYRISTOYL CHLORIDE			12.0～18.0	0.1↓	0.8↓	3
DISTILLED PALMITOYL CHLORIDE	Light Yellow Liquid (Solid in winter)		12.0～13.5	0.1↓	0.8↓	11～12
DISTILLED ISOPALMITOYL CHLORIDE	Light Yellow Liquid		12.0～14.0	0.2↓	1.5↓	-50↓
REFINED STEAROYL CHLORIDE	Light Yellow Liquid (Solid in winter)		11.5～13.0	0.1↓	1.5↓	Approx.10
ISOSTEAROYL CHLORIDE 《another kind of branched》 ※Under development	Light Yellow Liquid		11.5～14.5	1.5↓	2.5↓	-30↓
REFINED ISOSTEAROYL CHLORIDE			10.1～12.1	0.1↓	2.5↓	-50↓
OLEYL CHLORIDE	Light Yellow Liquid		12.5～15.5	1.5↓	6.5↓	Approx.-44
BEHENYL CHLORIDE ※Under development	Light Yellow Solid		9.3～12.3	1.5↓	5.0↓	50～60
DISTILLED SEBACOYL DICHLORIDE	Light Yellow Liquid		28.7～30.7	0.2↓	2.5↓	-5

9.SURFACTANTS



A surfactant with a negative-charged lipophilic part when dissolved in water.
The representative counter ion is Na^+ and K^+.

A surfactant with a positive-charged lipophilic part when dissolved in water.
The representative counter ion is Cl^- and $SO4^-$.

A surfactant with both cationic and anionic centers in the molecule,showing cationic or anionic behavio based on pH.

A surfactant with a non-charged molecule when dissolved in water including ether bond or hydroxyl group in it.

(1) Krafft point

The solubility of the ionic surfactants has increases gently as the temperature increases, and remarkably increases around krafft point.

(2) Cloud point

Regarding ethylene oxide-based non-ionic surfactants, the hydration force (hydrogen bond) decreases as the temperature increases. Above their cloud points, they become insoluble releasing water molecules.

(3) Hydroxyl value (OHV , mgKOH/g)

Amount of KOH required for neutralizing acetic acid necessary to acetylate hydroxyl groups.

(4) Calculation formula for average molecular weight from OHV

$$\text{Average Molecular Weight} = \frac{56.1 \times \text{Functional group}}{\text{OHV}} \times 1000$$

(5) HLB (Hydrophilic-lipophilic balance)

HLB is the ratio of oil-soluble and water-soluble parts of molecule. It is originally developed for ethoxylated surfactant (ranging from 0 to 20).

9. 1 ANIONIC SURFACTANT

9. 1. 1 Alkyl sulfate type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
SINTREX EH-R	Light Yellow Liquid	2-Ethylehexyl sulfate ester -sodium salt (Aqueous solution)	$C_4H_9-CH(C_2H_5)-CH_2-O-SO_3Na$	40
PERSOFT®SP ※Production by Order	Light Yellow Liquid (Solid in Winter)	Lauryl sulfate ester sodium salt (Aqueous solution)	$C_{12}H_{25}-O-SO_3Na$	Approx.30
PERSOFT®SK	Light Yellow Liquid (Solid in Winter)	Alkyl sulfate ester sodium salt (Aqueous solution)	$R-O-SO_3Na$ $R=C_8\sim C_{18}$	Approx.30
PERSOFT®SF-T	Light Yellow Liquid	Lauryl sulfate ester -triethanolamine salt (Aqueous solution)	$R-O-SO_3H\cdot N(C_2H_4OH)_3$ $R=C_{12}\sim C_{14}$	Approx.40

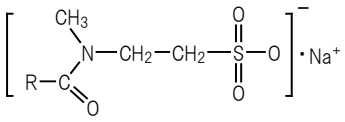
9. 1. 2 Alkyl ether sulfate type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN TRAX®K-40	Light Yellow Liquid	Polyoxyethylene lauryl ether sulfate -sodium salt (Aqueous solution)	$C_{12}H_{25}-O-(C_2H_4O)_n-SO_3Na$ K-40 $n\fallingdotseq 4$ K-300 $n\fallingdotseq 30$	Approx.28
NISSAN TRAX®K-300	Light Yellow Liquid			Approx.30
PERSOFT®EF	Light Yellow Liquid	Polyoxyethylene alkyl ether sulfate -sodium salt (Aqueous solution)	$R-O-(C_2H_4O)_n-SO_3Na$ EF $R=C_{12}, C_{14}$ EDO $R=C_{12}, C_{13}$ EL $R=C_{10}\sim C_{18}$ EK $R=C_{10}\sim C_{18}$	25
PERSOFT®EDO	Light Yellow Liquid			Approx.26
PERSOFT®EL	Light Yellow Liquid (Turbid in Winter)			Approx.25
PERSOFT®EK	Light Yellow Liquid (Turbid in Winter)			Approx.30
PERSOFT®EF-T	Light Yellow Liquid	Polyoxyethylene lauryl ether sulfate -triethanolamine salt (Aqueous solution)	$R-O-(C_2H_4O)_n-SO_3H\cdot N(C_2H_4OH)_3$ EF-T $R=C_8\sim C_{18}$ EL-T R=Coconut	36
PERSOFT®EL-T ※Production by Order	Light Yellow Liquid			30

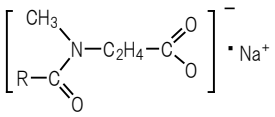
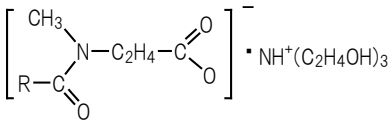
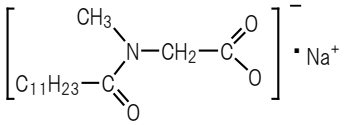
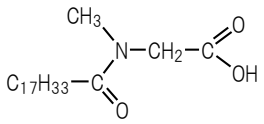
9. 1. 3 Amide ether sulfate type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
SUNAMIDE®CF-3	Light Yellow Liquid (Solid in winter)	Polyoxyethylene fatty acid -monoethanolamide sulfate (Aqueous solution)	$R-C(=O)-N(H)-(C_2H_4O)_n-S(=O)(=O)-O^-\cdot Na^+$ CF-3 $R=C_{12}, C_{14}$ (3:1) CF10 $R=C_{12}, C_{14}$ (7:3)	34～38
SUNAMIDE®CF-10	Light Yellow Liquid (Solid in winter)			41～46

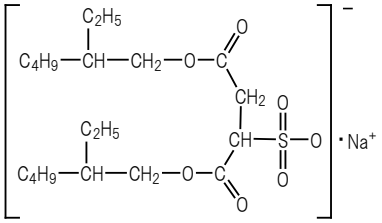
9. 1. 4 Methyltaurine type

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 Paste	N-(Coconut oil acyl) -N-methyltaurine sodium salt (Aqueous solution)		26～29
DIAPON®K	White～Light Yellow Paste (Room temperature)			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 (Aqueous solution)		24～30

9. 1. 5 Amino acid type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
SOFTILT®AS-L	Clear～Light Yellow Liquid	N-Dodecanoyl-N-methyl -β-alanine sodium salt (Aqueous solution)		30
SOFTILT®AT-L	Clear～Light Yellow Liquid	N-Dodecanoyl-N-methyl -β-alanine triethanolamine salt (Aqueous solution)		30
FIRET®L	Light Yelllow Liquid	N-Lauroyl-N-methylglycine -sodium salt(Aqueous solution) 《Sodium lauroyl sarcosine》		30
OLEOYLSARCOSINE 221P	Light Yellow～Dark Brown Liquid	N-Oleoyl-N-methylglycine 《Oleoyl sarcosine》		100

9. 1. 6 Sodium dialkyl sulfosuccinate

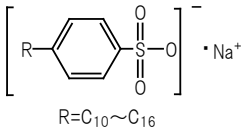
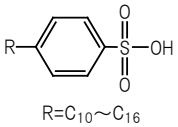
Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
RAPISOL®A-30	Clear Viscous Liquid	1,4-Bis(2-ethylhexyl) -sodium sulfosuccinate		30
RAPISOL®A-70 (Smoll-lot production)	Clear～Light Yellow Viscous Liquid			70
RAPISOL®A-80	Clear～Light Yellow Viscous Liquid			80
RAPISOL®A-90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

Wettability

Surface tention of aqueous solution (20℃)	Concentration of RAPISOL® (ppm)						
	5,000	2,000	1,000	500	100	50	0
Surface tention (mN/m)	27.3	27.6	30.6	34.8	47.7	51.5	72.5

Penetrating power of aqueous solution		Concentration of RAPISOL® (ppm)			
		5,000	1,000	500	100
Time for Felt to sink (20×10×6)mm	25℃	0.4 sec.	4.1 sec.	12.3 sec.	300 sec.
	50℃	0.4 sec.	2.0 sec.	5.6 sec.	64 sec.
	70℃	0.3 sec.	1.4 sec.	1.7 sec.	23 sec.

9. 1. 7 Alkylbenzene sulfonate

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NEWREX®R-25L	Yellowish White Liquid	Linear alkylbenzene -sulfonic acid sodium salt (Aqueous solution)	 R=C_{10}～C_{16}	Approx.25
NEWREX®R	Yellowish White Paste			Approx.50
NEWREX®SOFT 30	White Powder	Linear alkylbenzene -sulfonic acid sodium salt (Na_2SO_4 dilution)		Approx.30
NEWREX®SOFT 60-N	White Powder			Approx.60
NEWREX®SOFT 5S	Dark Brown Viscous Liquid	Linear alkylbenzene -sulfonic acid	 R=C_{10}～C_{16}	96↑

9. 1. 8 Fatty acid soap(Potassium)

Product Name	Appearance	Chemical Name	Water (%)	Pure Soap (%)
NONSOUL LK-2	White Flake	Potassium laurate	5↓	98↑
NONSOUL LK-5	Light Yellow Flake	Potassium salt of fatty acid (C12-20)	—	98↑
NONSOUL LK-30	Light Yellow Liquid	Potassium cocoate (Aqueous solution)	Approx.70	—
NONSOUL MK-1	White Flake	Potassium myristate	10↓	98↑
NONSOUL PK-1	White Flake	Potassium palmitate	10↓	97↑
NONSOUL TK-1	Light Yellow Flake	Potassium salt of tallow fatty acid	10↓	—
NONSOUL SK-1	White Needle-Shaped	Potassium salt of hardened tallow fatty acid 《Potassium stearate》	8↓	96↑
NONSOUL OK-1	Yellow Liquid	Potassium oleate (Aqueous solution)	Approx.80	—
NONSOUL OK-2	Yellow Liquid	Potassium oleate (Aqueous & diethanolamine solution)	Approx.60 *solvent	—

9. 1. 9 Fatty acid soap(Sodium)

Product Name	Appearance	Chemical Name	Water (%)	Pure Soap (%)
NONSOUL LN-1	White Flake	Sodium laurate	20↓	97↑
NONSOUL MN-1	White Flake	Sodium myristate	10↓	—
NONSOUL PN-1	Yellow Needle-Shaped	Sodium salt of fatty acid	13↓	97↑
NONSOUL PN-1 POWDER	Light Yellow Powder		7↓	97↑
MARSEILLE SOAP	Yellow Needle-Shaped	Sodium salt of tallow fatty acid	10↓	96↑
MARSEILLE SOAP T POWDER	Yellow Powder		7↓	92↑
NONSOUL TN-1	White Needle-Shaped	Sodium salt of hydrogenated tallow fatty acid	10↓	—
NONSOUL SN-1	White Flake	Sodium salt of hardened tallow fatty acid 《Sodium stearate》	25↓	96↑
NONSOUL SN-1A	White Needle-Shaped		15↓	96↑
NONSOUL SN-15	White Flake		10～15	97↑
NONSOUL SN-1 POWDER	White Powder		15↓	96↑
NONSOUL SN-1W1	White Powder	Sodium stearate	2↓	96↑
NONSOUL ON-A	Yellow Needle-Shaped	Sodium oleate	6↓	95↑
NONSOUL ON-A POWDER	Light Yellow Powder			
NONSOUL ON-1N	Yellow Flake			

9. 2 CATIONIC SURFACTANT

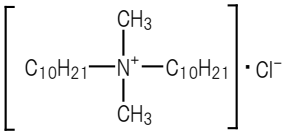
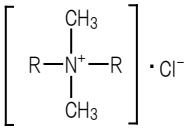
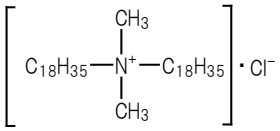
9. 2. 1 Amine salt type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN CATION®MA	Light Yellow Flake	Tetradecylamine acetate	$C_{14}H_{29}-NH_2 \cdot CH_3-C(=O)-OH$	100
NISSAN CATION®SA	Light Yellow Flake	Octadecyl amine acetate	$C_{18}H_{37}-NH_2 \cdot CH_3-C(=O)-OH$	100

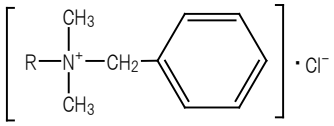
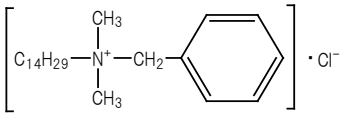
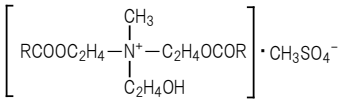
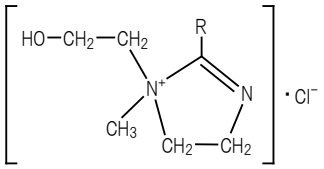
9. 2. 2 Trimethyl type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN CATION®BB	Light Yellow Liquid	Dodecyl trimethyl -ammonium chloride (Aqueous solution)	$[C_{12}H_{25}-N^+(CH_3)_2-CH_3]\cdot Cl^-$	30
NISSAN CATION®FB	Light Yellow Liquid	Coco-alkyl trimethyl -ammonium chloride (Aqueous solution)	$[R-N^+(CH_3)_2-CH_3]\cdot Cl^-$	30
NISSAN CATION®PB-300	Light Yellow Liquid	Hexadecyl trimethyl -ammonium chloride (Aqueous solution)	$[C_{16}H_{33}-N^+(CH_3)_2-CH_3]\cdot Cl^-$	28
NISSAN CATION®ABT2-500 ※Production by Order	Light Yellow Viscous Liquid	Tallow-alkyl trimethyl -ammonium chloride (Aqueous & IPA solution)	$[R-N^+(CH_3)_2-CH_3]\cdot Cl^-$	50
NISSAN CATION®AB	Light Yellow Viscous Liquid	Octadecyl trimethyl -ammonium chloride (Aqueous & IPA solution)	$[C_{18}H_{37}-N^+(CH_3)_2-CH_3]\cdot Cl^-$	20～25
NISSAN CATION®AB-600	Light Yellow Viscous Liquid			60～66
NISSAN CATION®VB-M FLAKE	Light Yellow Flake	Behenyl trimethyl -ammonium chloride (Contains 20% IPA)	$[C_{22}H_{45}-N^+(CH_3)_2-CH_3]\cdot Cl^-$	80
NISSAN CATION®VB-F	Light Yellow Flake	Behenyl trimethyl -ammonium chloride (Contains 20% ethanol)		

9. 2. 3 Dialkyl type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)
NISSAN CATION®2-DB-500E	Light Yellow Liquid	Didecyl dimethyl -ammonium chloride (Aqueous & ethanol solution)		48～52
NISSAN CATION®2-DB-800E				Approx.80
NISSAN CATION®2ABT	Light Yellow Viscous Liquid	Bis(hydrogenated tallow -alkyl)dimethyl -ammonium chloride (Aqueous & IPA solution)		75
NISSAN CATION®2-OLR	Light Yellow Liquid	Dioleyl dimethyl -ammonium chloride (Aqueous & IPA solution)		75

9. 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		50
NISSAN CATION®M_2-100R	White～Light Yellow Powder	Tetradecyl dimethyl benzyl -ammonium chloride		90↑
NISSAN CATION®EQ-01D	White Solid	N,N-Diacyloxyethyl-N -hydroxyethyl-N-methyl -ammonium methylsulfate (Contains diethyleneglycol)		83～87
NISSAN CATION®AR-4	Light Yellow Liquid	1-Methyl-1-hydroxyethyl -2-alkyl tallow Imidazolium -chloride (Aqueous & IBA solution)		35

9. 3 NONIONIC SURFACTANT

9. 3. 1 Ether type (1)

Product Name	Appearance	Chemical Name	Structural Formula	Cloud Point (℃)	HLB	Freezing Point (℃)
NONION K-204	Clear～Light Yellow Liquid	Polyoxyethylene -lauryl ether	$C_{12}H_{25}O-(C_2H_4O)_n-H$	0↓	9.7	Approx.15
NONION K-220	White～Light Yellow Solid			100↑	16.5	Approx.40
NONION K-230	White～Light Yellow Solid			100↑	17.5	Approx.45
NONION K-2100W (The addition of Antioxidant)	Clear～Light Yellow Liquid	Polyoxyethylene lauryl ether (Contains 50% water)		100↑	19.2	0↓
PERSOFT®NK-60	Light Yellow Liquid	Polyoxyethylene alkyl ether (Contains 10% water)	$R-O-(C_2H_4O)_n-H$	55～63	12.0	5↓
PERSOFT®NH-90C	Light Yellow～Brown Solid	Polyoxyethylene alkyl ether		Approx.78	13.5	Approx.30
PERSOFT®NK-100	Light Yellow Liquid	Polyoxyethylene alkyl ether (Contains 20% water)		90↑	14.0	10↓ (Pour Point)
PERSOFT®NK-100C	White～Light Yellow Solid (Milky-White Liquid in Summer)	Polyoxyethylene alkyl ether				Approx.25
NONION P-208	White～Light Yellow Solid	Polyoxyethylene -cetyl ether	$C_{16}H_{33}O-(C_2H_4O)_n-H$	40～55	11.9	Approx.25
NONION P-210	White～Light Yellow Solid			60～75	12.9	Approx.28
NONION P-213	White～Light Yellow Solid			85～95	14.1	28～38
NONION E-202 NONION E-202S	Clear～Light Yellow Liquid	Polyoxyethylene -oleyl ether	$C_{18}H_{35}O-(C_2H_4O)_n-H$	0↓	4.9	Approx.2
NONION E-205 NONION E-205S	Clear～Light Yellow Liquid			0↓	9.0	Approx.4
NONION E-212	White～Light Yellow Solid			80↑	13.3	Approx.31
NONION E-215	White～Light Yellow Solid			95↑	14.2	Approx.35
NONION E-230	White～Light Yellow Solid			100↑	16.6	Approx.40
NONION S-202	White～Light Yellow Solid	Polyoxyethylene -stearyl ether	$C_{18}H_{37}O-(C_2H_4O)_n-H$	0↓	4.9	Approx.40
NONION S-207	White～Light Yellow Solid			0↓	10.7	30～36
NONION S-215	White～Light Yellow Solid			90↑	14.2	Approx.40
NONION S-220	White～Light Yellow Solid			100↑	15.3	Approx.45
NONION B-250 (Smoll-lot production)	White～Light Yellow Solid	Polyoxyethylene -behenyl ether	$C_{22}H_{45}O-(C_2H_4O)_n-H$	100↑	17.4	Approx.53

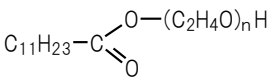
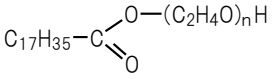
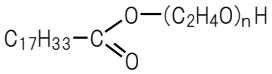
9. 3. 1 Ether type (2)

Product Name	Appearance	Chemical Name	Structural Formula	Cloud Point (℃)	HLB	Freezing Point (℃)
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	Clear～Light Yellow Liquid			73～79	14.6	Approx.-10
NONION ID-203	Clear～Light Yellow Liquid	Polyoxyethylene -isodecyl ether	$C_{10}H_{21}O-(C_2H_4O)_n-H$	0↓	9.1	Approx.-1
NONION ID-206	Clear～Light Yellow Liquid			44～54	12.5	Approx.4
NONION ID-209	Clear～Light Yellow Liquid			70↑	14.3	Approx.15
DISPANOL®TOC	Clear～Light Yellow Liquid	Polyoxyethylene -alkyl(branch)ether	$R-O-(C_2H_4O)_n-H$	45～55	13.0	5～25
NONION HT-505	Clear～Light Yellow Liquid	Polyoxyethylene -polyoxypropylene -alkyl ether	—	5↓	5	Approx.-17
NONION HT-507 ※Under development	Clear～Light Yellow Liquid			10～25	7	Approx.-2
NONION HT-510	Clear～Light Yellow Liquid			60～75	10	Approx.19
NONION HT-512 ※Under development	White～Light Yellow Solid			80～90	12	Approx.26
NONION HT-515 ※Under development	White～Light Yellow Solid			100↑	15	Approx.42
NONION HT-518 ※Under development	White～Light Yellow Solid			100↑	18	Approx.51

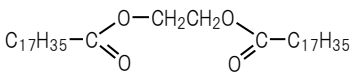
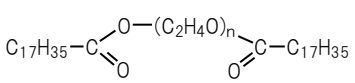
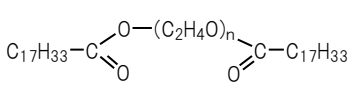
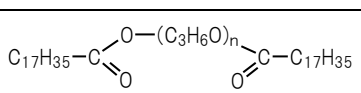
9. 3. 2 Special ether type

Product Name	Appearance	Chemical Name	Structural Formula	Cloud Point (℃)	HLB	Freezing Point (℃)
UNILUBE®MS-70K	Clear～Light Yellow Liquid	Polyoxypropylene -stearyl ether	$C_{18}H_{35}O-(C_3H_6O)_n-H$	—	—	-10↓
DISPANOL®16	White～Light Yellow Solid	Mixture	—	—	—	Approx.40
DISPANOL®16A		Special type		0↓	—	30～36
DISPANOL®LS-100	Clear～Light Yellow Liquid	Special type	—	23～29	9.7	-25↓
NONION MN-811	Clear～Light Yellow Liquid	Special type	—	Approx.45	8.3	Approx.20

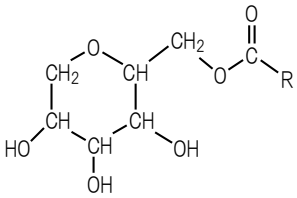
9. 3. 3 Ester type

Product Name	Appearance	Chemical Name	Structural Formula	Cloud Point (℃)	HLB	Freezing Point (℃)
NONION L-2	Light Yellow Liquid	Polyoxyethylene -mono laurate		—	10.0	-3～10
NONION L-4	Clear～Light Yellow Liquid			40～50	13.3	Approx.10
NONION S-2	White～Light Yellow Solid	Polyoxyethylene -mono stearate		—	8.0	33～41
NONION S-4	White～Light Yellow Solid			—	11.6	30～40
NONION S-6	Yellow～Brown Solid			45～55	13.6	Approx.35
NONION S-15	Light Yellow～Brown Solid			—	13.6	Approx.40
NONION S-15K	Light Yellow～Brown Solid					
NONION S-15.4	White～Light Yellow Solid			100↑	16.8	40～45
NONION S-15.4V	White～Light Yellow Solid					
NONION S-40	White Flake			100↑	18.3	Approx.50
NONION O-2	Yellow～Yellowish Dark Brown Liquid	Polyoxyethylene -mono oleate		—	8.3	-20↓
NONION O-3	Yellow～Yellowish Dark Brown Liquid			—	10.2	Approx.-8
NONION O-4	Yellow～Dark Brown Viscous Liquid			—	11.6	Approx.-5
NONION O-6	Yellow～Dark Brown Viscous Liquid			40～50	13.5	Approx.13

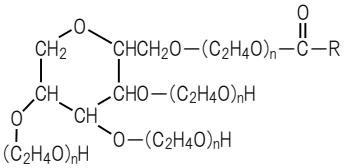
9. 3. 4 Diester type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
UNISTER®E-275	Light Yellow Flake	Ethyleneglycol -distearate		—	Approx.63 (Melting Point)
NONION DS-60HN	Light Yellow Flake	Polyethyleneglycol -distearate		19.0	Approx.60 (Melting Point)
NONION DO-4	Yellow～Dark Brown Liquid	Polyethyleneglycol -dioleate		8.6	25↓
NONION DO-6				10.6	25↓
UNISAFE NKL-9520	Clear～Light Yellow Liquid	Polypropyleneglycol -distearate		—	-10

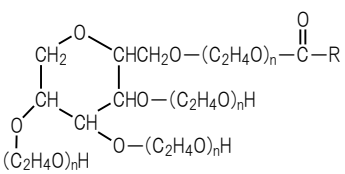
9. 3. 5 Sorbitan derivatives

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

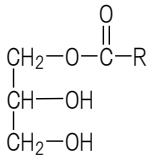
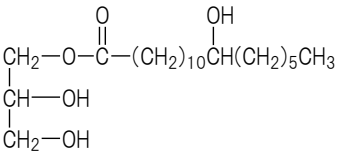
9. 3. 6 Polyoxyethylene sorbitan derivatives

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
NONION LT-221	Yelllow～Dark Brown Viscous Liquid	Polyoxyethylene -sorbitan mono laurate	 (Structual formula is monoester)	16.7	Approx.-5
NONION LT-280	Light Yellow～Yellow Solid			19.0	Approx.40
NONION LT-280W (The addition of Antioxidant)	Light Yellow～Yellow Liquid				0↓
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
NONION OT-521	Light Yellow～Yellow Liquid	Polyoxyethylene -sorbitan tri oleate		10.8	—

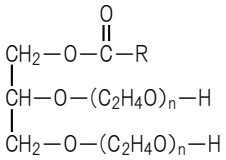
9. 3. 7 Polyoxyethylene sorbitan derivatives (Food additive)

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
WILSURF®TF-20 (Food Additive)	Yelllow～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

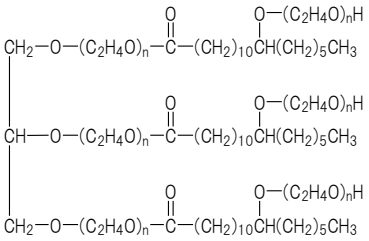
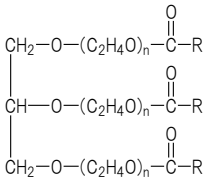
9. 3. 8 Monoglyceride type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
MONOGLY D	White Powder	Glycerol mono stearate (Distilled grade)		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)
MONOGLY H (Smoll-lot production)	Light Yellow Liquid	Glycerol -mono caster oil ester		4.0	Approx.23 (Pour Point)

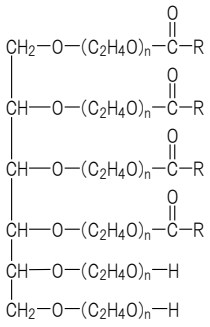
9. 3. 9 Polyoxyethylene monoglyceride type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
UNIGLY®MK-207	Clear～Light Yellow Liquid	Polyoxyethylene -glyceryl mono cocoate		13.0	Approx.-1.5
UNIGLY®MK-230	Light Yellow Liquid			17.4	Approx.12

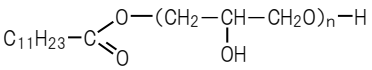
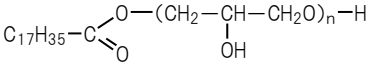
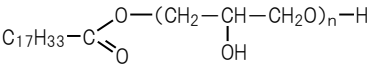
9. 3. 10 Polyoxyethylene glyceride type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
UNIOX®HC-8 ※Production by Order	Light Yellow Liquid	Polyoxyethylene -hydrogenated castor oil		5.5	Approx.6
UNIOX®HC-40	Waxy Solid			13.3	Approx.25
UNIOX®HC-60	Waxy Solid			15.0	30～35
UNIOX®C-2300 (Smoll-lot production)	Light Yellow～Dark Brown Liquid	Polyoxyethylene castor oil		12.0	Approx.20
UNIOX®GT-20IS	Light Yellow Liquid	Polyoxyethylene -glyceryl tri-isostearic acid		10.4	0↓

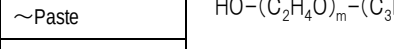
9. 3. 11 Sorbitol derivatives

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
UNIOX®ST-30E	Light Yellow～Yellow Liquid	Polyoxyethylene -sorbitol tetra oleate		11.2	0↓
UNIOX®ST-40E	Light Yellow～Yellow Liquid			12.5	0↓
UNIOX®ST-60E	Light Yellow～Yellow Viscous Liquid			14.2	Approx.12

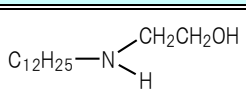
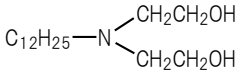
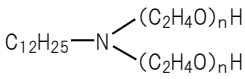
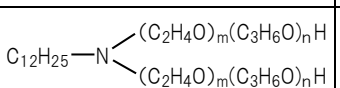
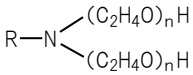
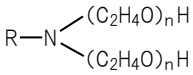
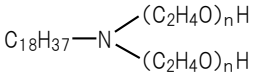
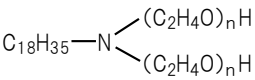
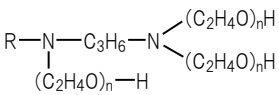
9. 3. 12 Polyglycerin alkyl ester type

Product Name	Appearance	Chemical Name	Structural Formula	HLB	Freezing Point (℃)
UNIGLY®GL-106	Light Yellow Liquid	Polyglycerin laurate ester		14.5	Approx.-9
UNIGLY®GS-106 (Smoll-lot production)	Light Yellow Flake	Polyglycerin stearate ester		11.4	Approx.60
UNIGLY®GO-102R	Light Yellow Liquid	Polyglycerin oleate ester		8.8	—
UNIGLY®GO-106 (Smoll-lot production)	Light Yellow Liquid			10.5	—

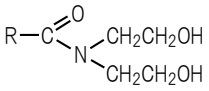
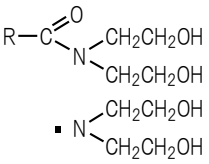
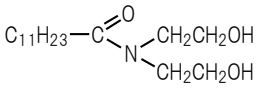
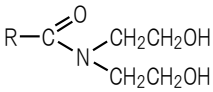
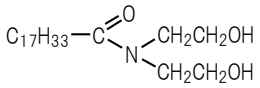
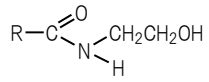
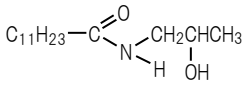
9. 3. 13 Polyoxyethylene polypropylene glycol

Product Name	Appearance	Chemical Name / Structural Formula	Cloud Point (℃)	EO (wt%)	Molecular Weight	Freezing Point (℃)
PLONON®#102	Clear～Light Yellow Liquid	Polyethyleneglycol-polypropyleneglycol -polyethyleneglycol (Block copolymer) 	28	20	1,250	-20↓
PLONON®#104	Clear～Light Yellow Liquid		62	40	1,670	5 (Pour Point)
PLONON®#201	Clear～Light Yellow Liquid		20	10	2,220	-10↓
PLONON®#202B	Clear～Light Yellow Liquid		30	20	2,400	-5↓ (Pour Point)
PLONON®#204	White Turbid Liquid ～Paste		62	40	3,330	Approx.20
PLONON®#208	White Flake		100↑	80	10,000	Approx.52
PLONON®70DP-600B	White～Light Yellow Flake		100↑	70	10,000	Approx.56
PLONON®70DP-950B	White～Light Yellow Flake		100↑	70	13,000	Approx.55

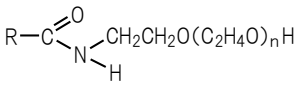
9. 3. 14 Polyoxyethylene alkyl amine type

Product Name	Appearance	Chemical Name	Structural Formula	Cloud Point (℃)	HLB	Freezing Point (℃)
NYMEEN®L-201	Yellow～Dark Brown Liquid	Polyoxyethylene -lauryl amine		0↓	3.8	Approx.10
NYMEEN®L-202	Yellow～Dark Brown Liquid			0↓	6.4	Approx.15 (Pour Point)
NYMEEN®L-207	Yellow～Dark Brown Liquid			80↑	12.5	Approx.−5
NYMEEN®L-703 (Smoll-lot production)	Yellow～Dark Brown Liquid	Polyoxyethylene -polyoxypropylene -lauryl amine		—	9.2	−30↓
NYMEEN®F-202	Yellow～Dark Brown Liquid	Polyoxyethylene -coco alkyl amine		0↓	6.1	Approx.0
NYMEEN®F-215	Yellow～Dark Brown Liquid			100↑	15.4	5↓
NYMEEN®T2-202	Yellow～Dark Brown Solid	Polyoxyethylene -tallow alkyl amine		0↓	5.0	Approx.25
NYMEEN®T2-210	Light Yellow～Dark Brown Liquid			95↑	12.5	0↓
NYMEEN®T2-230	Light Yellow～Dark Brown Liquid			100↑	16.7	Approx.20
NYMEEN®S-202	Yellow～Dark Brown Solid	Polyoxyethylene -stearyl amine		0↓	5.0	Approx.45
NYMEEN®S-204	Yellow～Dark Brown Solid			0↓	8.0	Approx.25
NYMEEN®S-210	Yellow～Dark Brown Liquid			90↑	12.5	Approx.10
NYMEEN®S-215	Yellow～Dark Brown Liquid			90↑	14.5	Approx.2
NYMEEN®S-220	Yellow～Dark Brown Liquid			100↑	15.4	Approx.5
NYMEEN®O-205	Yellow～Dark Brown Liquid	Polyoxyethylene -oleyl amine		100↑	9.0	0↓
NYMEEN®DT-203	Dark Brown Liquid	Polyoxyethylene -alkyl propylene -diamine		0↓	6.0	Approx.15
NYMEEN®DT-208	Dark Brown Liquid			100↑	10.7	Approx.5

9. 3. 15 Alkanol amide type

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
STAFOAM®FK	Yellow Viscous Liquid	Mixture of anionic and nonionic surfactant		—
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
STAFOAM®DL	Light Yellow Solid	Lauric acid diethanolamide (1:1 type)		40～47 (Melting Point)
STAFOAM®DF-1 (Smoll-lot production)	Light Yellow Viscous Liquid	Coconut fatty acid -diethanol amide (1:1 type)	 DF-1: C_{12} (Approx.60%) DF-2: C_{12} (Approx.50%) DF-4: C_{12} (Approx.70%) DFC : C_{12} (Approx.50%) +Containing glycerin	-4～-7
STAFOAM®DF-2 (Smoll-lot production)	Light Yellow 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 (1:1 type)		Approx.6
STAFOAM®DOS	Light Yellow Viscous Liquid			6
STAFOAM®MF PELLET	Light Yellow Pellet	Coconut fatty acid -monoethanolamide		65～75 (Melting Point)
STAFOAM®LIPA ※Production by Order	Light Yellow Waxy Solid	Lauric acid -monoisopropanolamide		Approx.60 (Melting Point)

9. 3. 16 Polyoxyethylene alkanol amide type

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
NYMID®MF-203	White～Light Yellow Solid	Polyoxyethylene fatty acid -monoethanolamide		Approx.23
NYMID®MF-210	White～Light Yellow Solid			Approx.25
NYMID®MT-215	White～Light Yellow Solid			40

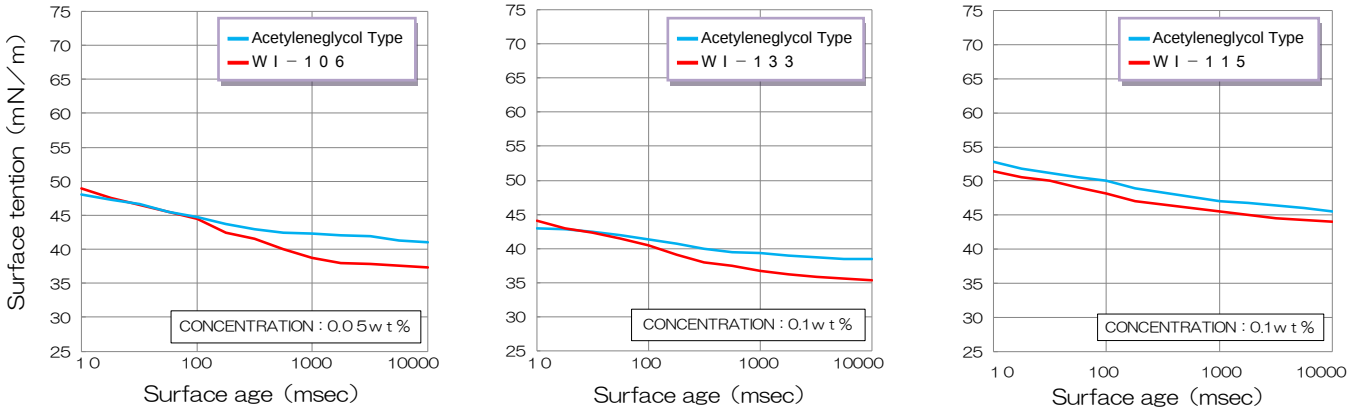
9. 3. 17 Amine oxide type

Product Name	Appearance	Chemical Name	Structural Formula	Active Component (%)	Freezing Point (℃)
UNISAFE A-LM	Clear～Light Yellow Liquid	Lauryl dimethylamine -oxide solution	$C_{12}H_{25}-N(CH_3)(CH_3)\rightarrow O$	35	−1
UNISAFE A-SM	White～Light Yellow Paster	Stearyl dimethylamine -oxide solution	$C_{18}H_{37}-N(CH_3)(CH_3)\rightarrow O$	35	Approx.25
UNISAFE A-LE	Light Yellow Turbid Liquid	Dihydroxyethyl -laurylamine oxide solution	$C_{12}H_{25}-N(CH_2CH_2OH)(CH_2CH_2OH)\rightarrow O$	40	Approx.−4
UNISAFE WHS-10	Light Yellow Liquid	Dihydroxyethyl -laurylamine oxide solution (Mixed with surfactant)	—	10	—

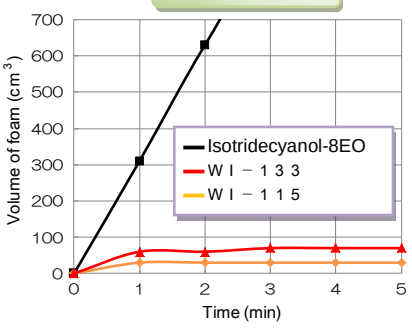
9. 3. 18 Low foaming wetting type

Product Name	Appearance	Viscosity(25℃) (mm^2/s)	Solubility in water(%)	HLB	Freezing Point (℃)	Dynamic surface tension at each surface age (mN/m)		
						10msec	100msec	1000msec
DISPANOL®WI-106 (Smoll-lot production)	Clear Liquid	28	0.1↓	5	−20↓	49.2	44.6	38.8
DISPANOL®WI-115		38	Approx.0.1	5	−20↓	44.3	40.6	36.7
DISPANOL®WI-133 (Smoll-lot production)		65	Soluble	11	−6	52.9	50.0	47.1

Dynamic surface tension



Low-foamin

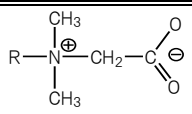
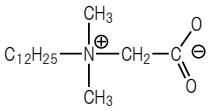
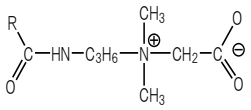
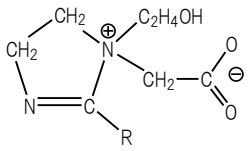
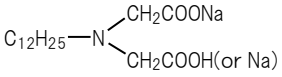


《Formulation ①》

Wetting agent	2wt%
Ethyleneglycol mono-tert-butylether	20wt%
Water	Remainder

- Dilute ① in to 50 times with water. ⇒ ②
- Put 200g of ② in a 1000mL graduated cylinder.
- Place at rest for 10 minutes in a water bath hold at 25℃.
- Blow air into the solution at 300mL/min.

9. 4 AMPHOTERIC SURFACTANT

Product Name	Appearance	Chemical Name	Structural Formula	Ash (%)	Active Component (%)
NISSAN ANON®BF	Light Yellow Liquid	Betaines, coco alkyldimethyl (Aqueous solution)		9↓	Approx.25
NISSAN ANON®BL	Light Yellow Liquid	1-Dodecanaminium, -N-(carboxymethyl)-N,N -dimethyl-, inner salt (Aqueous solution)		6↓	33.5～38.5
NISSAN ANON®BL-SF	Light Yellow Liquid			2↓	33.5～37.5
NISSAN ANON®BDF-R	Light Yellow Liquid	1-Propanaminium,3-amino -N-(carboxymethyl)-N,N -dimethyl-,N-coco acyl -derivatives., inner salts (Aqueous solution)	 BDF : R= Coconut fatty acid BDC : R= Palm kernel BDL : R= $C_{11}H_{23}$	8↓	Approx.30
NISSAN ANON®BDF-SF				2↓	Approx.30
NISSAN ANON®BDC-SF	Clear～Light Yellow Liquid	1-Propanaminium, -N-(carboxymethyl)-N,N -dimethyl-3-[(1-oxododecyl) -amino]-, inner salt (Aqueous solution)		1.5↓	Approx.30
NISSAN ANON®BDL-SF	Light Yellow Liquid			1.5↓	Approx.30
NISSAN ANON®LG-R	Light Yellow Viscous Liquid (Turbid upper 20℃)	Glycine, -N-[2- [[2-(dodecyl -amino)ethyl] amino] ethyl] (Aqueous & Ethanol solution)	$C_{12}H_{25}$-$(NHC_2H_4)_2$-NH▪CH_2COONa	—	Approx.30
NISSAN ANON®GLM-R (Smoll-lot production)	Yellow Liquid	Imidazolium compounds, -1-(carboxymethyl)-4,5-dihydro -1-(hydroxyethyl)-2-norcoco -alkyl, hydroxides, inner salts (Aqueous solution)		8～10	Approx.30
NISSAN ANON®GLM-R-LV				5.5～6.5	Approx.30
NISSAN ANON®LA	Light Yellow Liquid (Turbid under 20℃)	Sodium laurylamino diacetate (Aqueous solution)		1.5↓	25～31
NISSAN ANON®LA POWDER (Smoll-lot production)	White～Light Yellow Powder	Sodium laurylamino diacetate		5～7	Approx.90

9. 5 POLYMER SURFACTANT

9. 5. 1 Polymer surfactant (1)

Product Name	Appearance	Chemical Name	Solubility in water	Viscosity(25℃) (mm^2/s)	Active Component (%)
POLYSTER®OMP ※Production by Order	White Powder	Sodium salts of high molecular weigh polycarbonates	◎	—	100
POLYSTER®OM	Light Yellow Clear or Dloudy Liquid	Sodium salts of high molecular weigh polycarbonates (Aqueous solution)	◎	50 (20℃)	Approx.25
POLYSTER®OMR	Light Yellow Clear Liquid		◎	50 (20℃)	Approx.25
POLYSTER®A-1060	Light Yellow Liquid		◎	—	Approx.43
POLYSTER®OMA	Light Yellow Clear or Dloudy Liquid	Ammonium salts of high molecular weight polycarbonates (Aqueous solution)	◎	90	Approx.21
MALIALIM®HKM-50A	Yellow～Dark Brown Viscous Liquid		◎	350	Approx.50
MALIALIM®HKM-150A			◎	200	Approx.50
FILLANOL®PA-075F	Light Yellow～Dark Brown Liquid	Amine functional polymer	○	500～700	100
FILLANOL®PA-085C	Light Yellow～Dark Brown Liquid		△	400～600	100
FILLANOL®PA-107P	Light Yellow～Dark Brown Liquid		×	1,600～1,800	100
ESLEAM®AD-3172M	Light Yellow～Yellow Liquid	Amine functional polymer	○	Approx.600	100
ESLEAM®AD-374M	Light Yellow～Yellow Liquid		△	Approx.500	100
ESLEAM®AD-508E	Light Yellow～Yellow Liquid		×	Approx.1,700	100

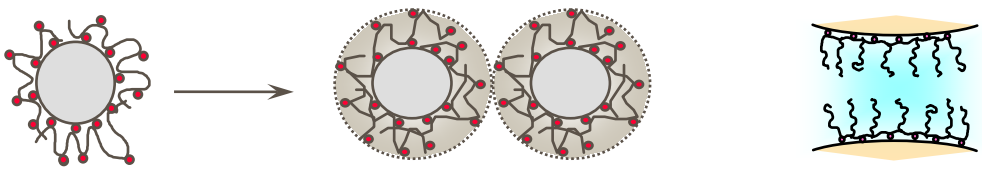
9. 5. 2 Polymer surfactant (2)

Product Name	Appearance	Chemical Name	Solubility in water	Viscosity(100℃) (mm^2/s)	Active Component (%)
MALIALIM®AKM-1511-60	Yellow～Dark Brown Liquid	Copolymer of polycarboxylic acid -derivatives (Aqueous solution)	◎	350 (25℃)	Approx.60
MALIALIM®AKM-0531	Yellow～Dark Brown Viscous Liquid	Copolymer of polycarboxylic acid -derivatives	◎	200	100
MALIALIM®AFB-1521	Yellow～Dark Brown Viscous Liquid		△	300	100
MALIALIM®AAB-0851	Yellow～Dark Brown Viscous Liquid		×	300	100
MALIALIM®AWS-0851	Yellow～Yellowish Dark Brown Viscous Liquid			500	100
MALIALIM®SC-0505K	Redish Liquid		◎	60	100
MALIALIM®SC-1015F	Yellow～Dark Brown Viscous Liquid		△	120	100
MALIALIM®SC-0708A	Yellow～Dark Brown Viscous Liquid		×	120	100

9. 5. 3 Applications of dispersant (Ceramics & Metals)

Solubility	Molecular weight	Adsorption part	Powders	Ceramics (Oxide・Nitride)				Ceramics (Carbide・Carbon material)				Metals (Ni:○ Ag:◇ Al:□)			
			Systems	Aqueous		Solvent		Aqueous		Solvent		Aqueous		Solvent	
			Particle size	1μm		1μm		1μm		1μm		1μm		1μm	
				↓	↑	↓	↑	↓	↑	↓	↑	↓	↑	↓	↑
Water-soluble	Middle	Acid	MALIALIM®SC-0505K	●	○	●	○					○◇□	○◇□	○◇□	○◇□
		Base	ESLEAM®AD-3172M	○	○	○	○					○◇□	○◇□	○◇□	○◇□
			FILLANOL®PA-075F					○	○	○	○				
	Hight	Acid	MALIALIM®AKM-0531	○	●	○	●					○◇□	○◇□	○◇□	○◇□
		Base	MALIALIM®HKM-50A	○	●			○	○			○◇□	○◇□		
			MALIALIM®HKM-150A	○	●			○	○			○◇□	○◇□		
			POLYSTER®OMA	○	●			○	○			○◇□	○◇□		
Non-water-soluble	Low	Acid	ESLEAM®221P											●◇□	●◇□
			ESLEAM®C-2093 Ⅰ ※Under development			●								○◇□	
		Base	NYMEEN®L-201											○◇□	○◆□
			NYMEEN®L-202											○◇□	○◇□
	Middle	Acid	MALIALIM®SC-1015F			●	○							○◇■	○◇□
			MALIALIM®SC-0708A			○	○							●◇□	○◇□
		Base	ESLEAM®AD-374M			○	●							○◇□	○◆□
			ESLEAM®AD-508E			○	●							○◇□	○◇□
			FILLANOL®PA-085C							○	○				
			FILLANOL®PA-107P							○	○				
	Hight	Acid	MALIALIM®AFB-1521			○	●							○◇□	○◆□
			MALIALIM®AAB-0851			○	●							○◇□	○◇□
			MALIALIM®AWS-0851			○	○							○◇□	●◇□

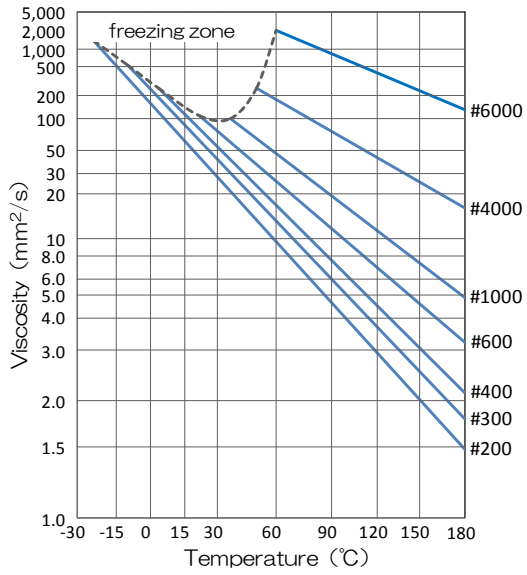
●◆■:Excellent

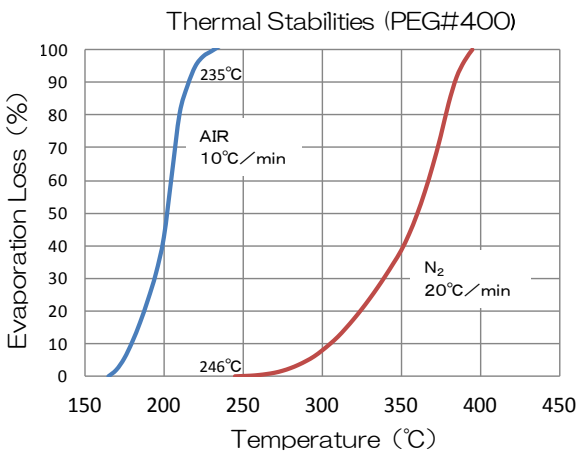


10.POLYETHER

10. 1 POLYETHYLENE GLYCOL

Product Name	Appearance	Chemical Name/ Structural Formula	Molecular Weight	Viscosity (100℃) (mm^2/s)	Freezing Point (℃)
PEG#200T	Clear～Light Yellow Liquid	Polyethyleneglycol (DEG:0.3% ↓)	200	3.8～4.8	-45 ↓
PEG#200	Clear～Light Yellow Liquid		200	3.6～4.6	-45 ↓
PEG#300	Clear～Light Yellow Liquid		300	5.0～6.2	-8 ↓
PEG#400	Clear～Light Yellow Liquid		400	6.0～8.0	6
PEG#600	Clear～Light Yellow Liquid		600	10.0～12.0	20
PEG#1000	White～Light Yellow Solid		1,000	17.0～20.0	40
PEG#1500	White～Light Yellow Solid		PEG#300、1540 (Mixture)	13.0～18.0	38
PEG#1540	White～Light Yellow Solid	Polyethyleneglycol	1,540	25.0～32.0	45
PEG#2000	White～Light Yellow Solid	$HO-(C_2H_4O)_n-H$	2,000	37.0～47.0	50
PEG#4000	White～Light Yellow Flake		3,100	75.0～85.0	55
PEG#4000P	White～Light Yellow Powder				
PEG#6000	White～Light Yellow Flake		8,800	700～900	60
PEG#6000P	White～Light Yellow Powder				
PEG#11000	White～Light Yellow Flake		11,000	1,000～1,750	58
PEG#20000	White～Light Yellow Flake		20,000	10,000～15,000	65





10. 2 POLYETHYLENE GLYCOL MONOMETHYL ETHER

Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Freezing Point (℃)
UNIOX®M-400	Clear～Light Yellow Liquid	Polyethyleneglycol -monomethyl ether	$CH_3-O-(C_2H_4O)_n-H$	400	0↓
UNIOX®M-550	Clear～Light Yellow Liquid			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-2500 ※Production by Order	White～Light Yellow Flake			2,500	Approx.53
UNIOX®M-3000 ※Production by Order	White～Light Yellow Solid			3,000	Approx.55
UNIOX®M-4000	White～Light Yellow Solid			4,000	Approx.55

10. 3 POLYETHYLENE GLYCOL DIMETHYL ETHER

Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Freezing Point (℃)
UNIOX®MM-400	Clear～Light Yellow Liquid	Polyethyleneglycol -dimethyl ether	$CH_3-O-(C_2H_4O)_n-CH_3$	400	Approx.5

10. 4 GLYCERYL POLYETHYLENE GLYCOL

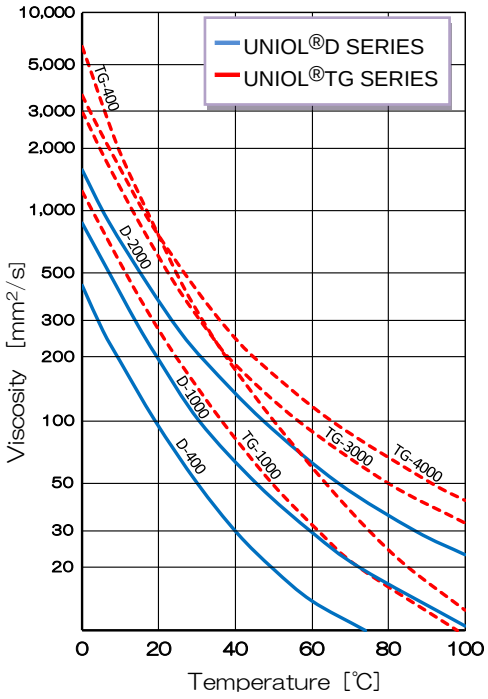
Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Freezing Point (℃)
UNIOX®G-450	Light Yellow Liquid	Polyethyleneglycol -glyceryl ether	$CH_2-O-(C_2H_4O)_l-H$ $CH-O-(C_2H_4O)_m-H$ $CH_2-O-(C_2H_4O)_n-H$	450	−20↓
UNIOX®G-750	Light Yellow Liquid			750	−20↓

10. 5 POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Solubility in water	Molecular Weight	Pour Point (℃)
UNIOL®D-200 ※Production by Order	Clear～Light Yellow Liquid	Polypropyleneglycol 《Diol type》	$HO-(C_3H_6O)_n-H$	∞	200	−30 ↓
UNIOL®D-250				∞	250	−30 ↓
UNIOL®D-400				∞	400	−30 ↓
UNIOL®D-700				∞	700	−40
UNIOL®D-1000				0.2	1,000	−30 ↓
UNIOL®D-1200				0.2	1,200	−30 ↓
UNIOL®D-2000				0.2	2,000	−30 ↓
UNIOL®D-4000				0.2	4,000	−20 ↓

10. 6 GLYCERYL POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Solubility in water	Molecular Weight	Pour Point (℃)
UNIOL®TG-330	Clear～Light Yellow Liquid	Polypropyleneglycol -glyceryl ether 《Triol type》	$CH_2-O-(C_3H_6O)_l-H$ $CH-O-(C_3H_6O)_m-H$ $CH_2-O-(C_3H_6O)_n-H$	∞	330	−25 ↓
UNIOL®TG-1000R				0.16	1,000	−25 ↓
UNIOL®TG-3000				0.02	3,000	−30 ↓
UNIOL®TG-4000				0.02	4,000	−25 ↓



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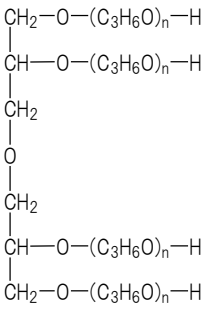
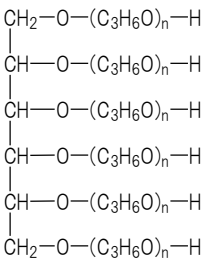
10. 7 DIGLYCERYL POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Freezing Point (℃)
UNILUBE®DGP-700 (The addition of Antioxidant)	Light Yellow Viscous Liquid	Polypropyleneglycol -diglyceryl ether		700	0↓
UNILUBE®DGP-700F					

10. 8 SORBITOL POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Freezing Point (℃)
UNIOL®HS-1600D	Clear Viscous Liquid	Polypropyleneglycol -sorbitol ether		1,600	0↓

10. 9 POLYBUTYLENE GLYCOL

Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Pour Point (℃)
UNIOL®PB-500	Clear～Light Yellow Liquid	Polybutyleneglycol	$HO-(C_4H_8O)_n-C_3H_6O-(C_4H_8O)_n-H$	500	0↓ (Freezing Point)
UNIOL®PB-700				700	-40↓
UNIOL®PB-1000 ※Under development				1,000	-40↓
UNIOL®PB-2000 ※Under development				2,000	-20↓
UNIOL®PB-4800 ※Under development				4,800	-20↓

10. 10 POLYETHYLENE-POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name / Structural Formula	EO (wt%)	Molecular Weight	Freezing Point (℃)
PLONON®#102	Clear～Light Yellow Liquid	Polyethyleneglycol-polypropyleneglycol-polyethyleneglycol $HO-(C_2H_4O)_m-(C_3H_6O)_n-(C_2H_4O)_m-H$ ※Block copolymer	20	1,250	−20 ↓
PLONON®#104	Clear～Light Yellow Liquid		40	1,670	5 (Pour Point)
PLONON®#201	Clear～Light Yellow Liquid		10	2,220	−10 ↓
PLONON®#202B	Clear～Light Yellow Liquid		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	White～Light Yellow Flake		70	13,000	Approx.55

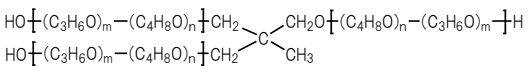
10. 11 POLYETHYLENE-POLYPROPYLENE GLYCOL

Product Name	Appearance	Chemical Name / Structural Formula	Molecular Weight	Freezing Point (℃)
UNILUBE®5TP-300KB	Clear～Light Yellow Liquid	Polyethyleneglycol-polypropyleneglycol pentaerythritol ether $HO-(C_2H_4O)_m-(C_3H_6O)_n-CH_2$ C $CH_2O-(C_3H_6O)_n-(C_2H_4O)_mH$ $HO-(C_2H_4O)_m-(C_3H_6O)_n-CH_2$ $CH_2O-(C_3H_6O)_n-(C_2H_4O)_mH$ m≒1.5 n≒16 ※Block type	4,000	−10 ↓

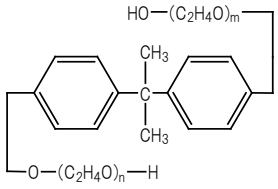
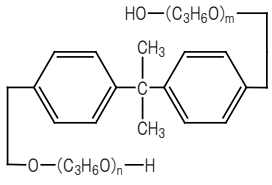
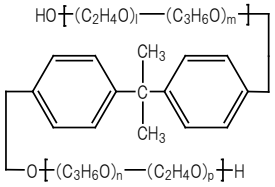
10. 12 POLYETHYLENE-POLYBUTYLENE GLYCOL

Product Name	Appearance	Chemical Name / Structural Formula	Molecular Weight	Freezing Point (℃)
WILBRIDE®RC-9050 (The addition of Antioxidant)	White～Light Yellow Solid	Polyethyleneglycol- polybutyleneglycol pentaerythritol ether $HO-(AO)_n-CH_2$ C $CH_2O-(AO)_n-H$ $HO-(AO)_n-CH_2$ $CH_2O-(AO)_n-H$ ※Block type	—	35

10. 13 TETRAMETHYLENE GLYCOL DERIVATIVES

Product Name	Appearance	Chemical Name / Structural Formula	THF (wt%)	Molecular Weight	Freezing Point (℃)
POLYCERIN®DC-1100	Clear～Light Yellow Liquid	Polyoxytetramethylen-polyoxyethyleneglycol $HO\text{-}[(C_4H_8O)_m\text{-}(C_2H_4O)_n]\text{-}H$ ＊[ ]:Random addition	35	1,000	0↓
POLYCERIN®DC-1800E	Clear～Light Yellow Liquid		50	1,800	-10↓
POLYCERIN®60DC-1800E (Smoll-lot production)	Clear～Light Yellow Liquid		40	1,800	-10↓
POLYCERIN®DC-3000E	Clear～Light Yellow Liquid		50	3,000	-10↓
POLYCERIN®DCB-1000	Clear～Light Yellow Liquid	Polyoxytetramethylen-polyoxypropyleneglycol $HO\text{-}[(C_4H_8O)_m\text{-}(C_3H_6O)_n]\text{-}H$ ＊[ ]:Random addition	45	1,000	0↓
POLYCERIN®DCB-2000	Clear～Light Yellow Liquid		60	2,000	0↓
POLYCERIN®DCB-4000 ※Production by Order	Clear～Light Yellow Liquid		65	4,000	0↓
POLYCERIN®TPBC-3030 (Smoll-lot production)	Clear～Light Yellow Liquid	Trimethylolpropane tris polyoxytetramethylen -polyoxypropyleneglycol ether  ＊[ ]:Random addition	—	3,000	0↓

10. 14 BISPHENOL A DERIVATIVES

Product Name	Appearance	Chemical Name	Structural Formula	Molecular Weight	Freezing Point (℃)
UNIOL®DA-400	Liquid	Polyoxyethylene -bisphenol A ether		400	-10↓
UNIOL®DA-700	Liquid			660	0↓
UNIOL®DB-400	Viscous Liquid	Polyoxypropylene -bisphenol A ether		400	20 (Pour Point)
UNILUBE®50DB-22	Liquid	Polyoxyethylene -polyoxypropylene -bisphenol A ether		750	-10↓

10. 15 POLYALKYLENE GLYCOL DERIVATIVES (1) (water-soluble type)

Product Name	Appearance	Viscosity (mm²/s)			Viscosity index	Molecular Weight	Pour Point (℃)
		20℃	40℃	100℃			
UNILUBE®50MB-2	Clear～Light Yellow Liquid	15	7.6	2.1	49	200	−65
UNILUBE®50MB-5	Clear～Light Yellow Liquid	40	19.7	4.7	171	500	−52.5
UNILUBE®50MB-11	Clear～Light Yellow Liquid	115	50.7	10.8	211	1,000	−45
UNILUBE®50MB-26	Clear～Light Yellow Liquid	310	134	25.7	228	2,000	−35
UNILUBE®50MB-72	Clear～Light Yellow Liquid	960	397	71.6	258	3,000	−32.5
UNILUBE®50MB-168	Clear～Light Yellow Liquid	2,700	945	160	—	4,000	−30
UNILUBE®60MB-16 Ⅰ ※Production by Order	Clear～Light Yellow Liquid	178	78.3	16.1	220	1,300	−40↓
UNILUBE®60MB-26 Ⅰ ※Production by Order	Clear～Light Yellow Liquid	329	130	25.6	236	1,700	−40↓
UNILUBE®25DE-60	Clear～Light Yellow Liquid	910	332	55.3	235	3,500	−40↓
POLYCERIN®25DE-2500 Ⅰ (Smoll-lot production)	Clear～Light Yellow Liquid	—	191	31.2	207	2,300	−20↓
UNILUBE®50DE-25	Clear～Light Yellow Liquid	340	129	24.5	224	1,750	−45
UNILUBE®75DE-15	Clear～Light Yellow Liquid	242	90.5	15.7	186	1,100	−5.5
UNILUBE®75DE-25	Clear～Light Yellow Liquid	332	126	22.0	203	1,400	−15
UNILUBE®75DE-60	Clear～Light Yellow Liquid	945	340	59.7	238	3,000	−2.5
UNILUBE®75DE-170	Clear～Light Yellow Liquid	2,850	1,050	160	—	5,000	0
UNILUBE®75DE-250 ※Production by Order	Clear～Light Yellow Liquid	—	1,421	219	—	6,200	0
UNILUBE®75DE-2620	Light Yellow Viscous Liquid	—	17,300	2,540	—	13,000	5
UNILUBE®75DE-3800	Light Yellow Viscous Liquid	—	24,940	3,730	—	15,000	5
UNILUBE®75DE-5000	Light Yellow Viscous Liquid	—	—	5,000	—	18,500	Approx.12
UNILUBE®80DE-40U	Clear Liquid	—	213	40.0	241	2,000	20 (Melting Point)

10. 15 POLYALKYLENE GLYCOL DERIVATIVES(2) (water-soluble type)

Product Name	Appearance	Viscosity (mm²/s)			Viscosity index	Molecular Weight	Pour Point (℃)
		20℃	40℃	100℃			
UNILUBE®15TY-260KB	Clear～Light Yellow Liquid	735	236	33.7	190	3,000	−30
UNILUBE®25TG-55	Clear～Light Yellow Liquid	1,300	350	54.1	218	4,550	−17.5
UNILUBE®50TG-18 ※Production by Order	Clear～Light Yellow Liquid	348	120	18.7	175	1,500	−40↓
UNILUBE®50TG-32	Clear～Light Yellow Liquid	545	178	29.7	209	2,800	−40
UNISAFE 75EL-138H	Clear～Light Yellow Liquid	—	27,790	3,880	—	15,000	Approx.5
UNISAFE AX-22 (The addition of Antioxidant)	Dark Brown～Reddish Dark Brown Liquid	1,640	340	21.7	74	—	−10↓

10. 16 POLYALKYLENE GLYCOL DERIVATIVES (non-water-soluble type)

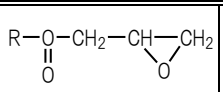
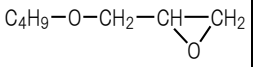
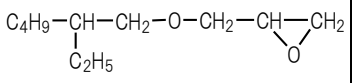
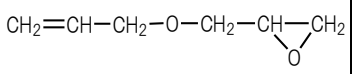
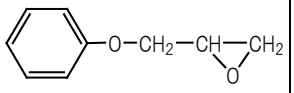
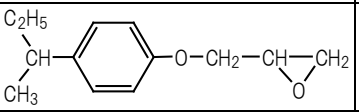
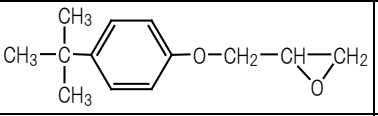
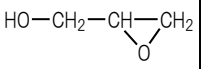
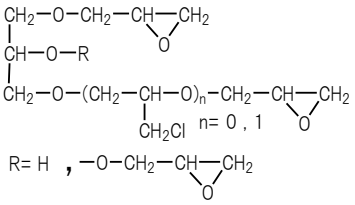
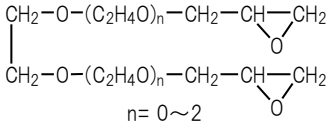
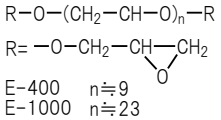
Product Name	Appearance	Viscosity (mm²/s)			Viscosity index	Molecular Weight	Pour Point (℃)
		20℃	40℃	100℃			
UNILUBE®MB-7	Clear～Light Yellow Liquid	72.0	32.8	6.8	168	700	−47.5
UNILUBE®MB-11	Clear～Light Yellow Liquid	135	56.1	10.8	187	1,000	−42.5
UNILUBE®MB-14	Clear～Light Yellow Liquid	173	73.4	13.8	195	1,200	−40
UNILUBE®MB-19	Clear～Light Yellow Liquid	236	105	18.9	202	1,300	−35
UNILUBE®MB-22	Clear～Light Yellow Liquid	297	125	21.8	203	1,400	−32.5
UNILUBE®MB-38	Clear～Light Yellow Liquid	561	227	36.6	212	1,900	−30
UNILUBE®MB-370	Clear～Light Yellow Liquid	894	330	53.6	229	2,300	−25
UNILUBE®MB-700	Clear～Light Yellow Liquid	1,788	616	96.7	250	3,000	−22.5
UNILUBE®MB-7X (The addition of Antioxidant)	Redish Liquid	85.0	34.8	6.8	155	700	−35↓
UNILUBE®MB-11X (The addition of Antioxidant)	Redish Liquid	160	60.1	11.0	178	1,000	−40↓
UNILUBE®10MB-250KB	Clear～Light Yellow Liquid	604	222	37.8	222	2,000	−40↓

10. 17 ALLYL POLYETHER

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

11.MONOMER

11. 1 GLYCIDYL ETHER & ESTER

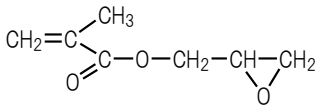
Product Name	Appearance	Chemical Name	Structural Formula	Viscosity(25℃) (mPa・s)	Epoxy Equivalent (g/eq.)
EPIOL®ES-F (Smoll-lot production)	Light Yellow Liquid	Coconut fattyacid -glycidyl ester		6.2 (60℃)	400↓
EPIOL®B ※	Clear～Light Yellow Liquid	1-Butyl glycidyl ether		1.4	145↓
EPIOL®EH-N	Light Yellow Liquid	2-Ethylhexyl -glycidyl ether		2.0	168～262
EPIOL®A ※	Clear～Light Yellow Liquid	Allyl glycidyl ether		1.1	—
EPIOL®P ※	Clear～Light Yellow Liquid	Phenyl glycidyl ether		6	150～163
EPIOL®SB (Smoll-lot production)	Light Yellow Liquid	*p-sec*-Butylphenyl -glycidyl ether		15	220～250
EPIOL®TB	Light Yellow Liquid	*p-tert*-Butylphenyl -glycidyl ether		30	4.2↑ (Epoxy Contents) (eq./kg)
EPIOL®OH ※	Colorless Liquid	Glycidol		4 (20℃)	—
EPIOL®G-100	Light Yellow Liquid	1,2,3-Propanetriol -polymer with -(chloromethyl)oxirane		120～175	160↓
EPIOL®E-100LC	Light Yellow Liquid	2,2'-[Ethylenebis -(oxymethylene)] -bisoxirane		15	145↓
EPIOL®E-400 (Smoll-lot production)	Light Yellow Liquid	Polyethyleneglycol -diglycidyl ether		60	263～303
EPIOL®E-1000 (Smoll-lot production)	Light Yellow Liquid			—	1.35～1.90 (Epoxy Contents) (eq./kg)

Epoxy Equivalent (g/eq.) = 1000 ÷ Epoxy Contents (eq./kg)
Epoxy Equivalent (g/eq.) = 16×100 ÷ Oxyran Oxygen (%)

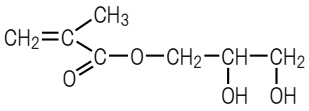
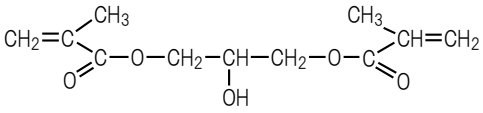
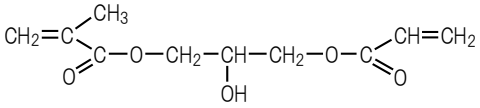
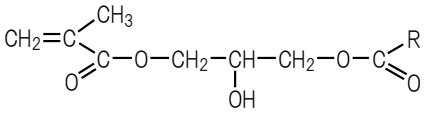
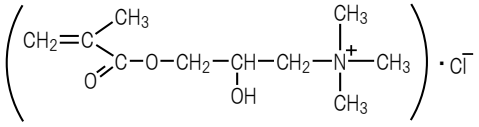
※ WARNING

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 mutigenicity. Of our products, EPIOL B, A, P, and OH are included in the group. **HANDLE THESE PRODUCTS WITH EXTRA CARE.**

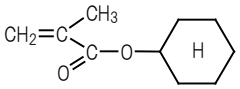
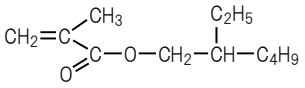
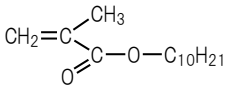
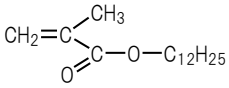
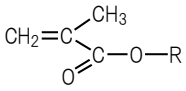
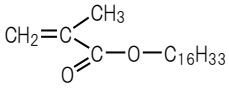
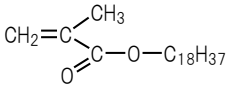
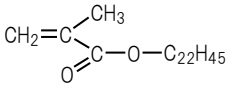
11. 2 GLYCIDYL METHACRYLATE

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®G	Glycidyl methacrylate		106-91-2 (46℃)
BLEMMER®GH	Glycidyl methacrylate (Low epichlorohydrin grade)		
BLEMMER®GS	Glycidyl methacrylate (Chlorine-free)		

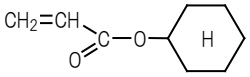
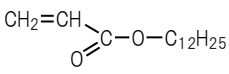
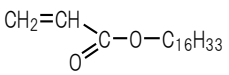
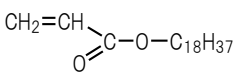
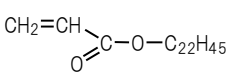
11. 3 GLYCIDYL METHACRYLATE DERIVATIVES

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®GLM	Glyceryl monomethacrylate		5919-74-4 (55℃)
BLEMMER®GLM-R ※Under development	Glyceryl monomethacrylate (Chlorine-free)		
BLEMMER®GMR-M ※Under development	Glyceryl dimethacrylate		1830-78-0 (-)
BLEMMER®GMR-R ※Under development	Glyceryl dimethacrylate (Chlorine-free)		
BLEMMER®GAM ※Under development	2-Hydroxy-3-acryloyl -oxypropylmethacrylate		1709-71-3 (-)
BLEMMER®GAM-R ※Under development	2-Hydroxy-3-acryloyl -oxypropylmethacrylate (Chlorine-free)		
BLEMMER®G-FA80	Fatty acid modified -glycidyl methacrylate (20% Solvent dilusion)		Registered (-)
BLEMMER®QA	N,N,N-Trimethyl-N-(2-hydroxy -3-metacryloyloxopropyl) -ammonium chloride (50% Aqueous solution)		13052-11-4 (-)

11. 4 ALKYL MOMO METHACRYLATE

Product Name	Chemical Name	Structural Formula	Melting Point (℃)	CAS No. (Tg：Polymer)
BLEMMER®CHMA	Cyclohexyl methacrylate		-50↓	101-43-9 (66℃)
BLEMMER®EHMA-25	2-Ethylhexyl methacrylate		—	688-84-6 (-10℃)
BLEMMER®DMA ※Production by Order	Decyl methacrylate		—	3179-47-3 (-70℃)
BLEMMER®LMA	Lauryl methacrylate		-20	142-90-5 (-65℃)
BLEMMER®SLMA-S BLEMMER®SLMA-SH	Alkyl ($C_{12,13}$) methacrylate		—	142-90-5 2495-25-2 (-64℃)
BLEMMER®CMA ※Production by Order	Alkyl methacrylate (C_{16}：70%)		Approx.12 (Freezing Point)	2495-27-4 (-9℃)
BLEMMER®SMA	Stearyl methacrylate		18～20	32360-05-7 (38℃)
BLEMMER®VMA ※Production by Order	Behenyl methacrylate (C_{22}：98%)		Approx.44	16669-27-5 (-)
BLEMMER®VMA-70	Behenyl methacrylate (C_{22}：70%)		Approx.38 (Freezing Point)	16669-27-5 (47℃)

11. 5 ALKYL MONO ACRYLATE

Product Name	Chemical Name	Structural Formula	Melting Point (℃)	CAS No. (Tg：Polymer)
BLEMMER®CHA	Cyclohexyl acrylate		-60↓	3066-71-5 (16℃)
BLEMMER®LA	Lauryl acrylate		0	2156-97-0 (-5℃)
BLEMMER®CA (Smoll-lot production)	Cetyl acrylate (C_{16}：95%)		19 (Freezing Point)	13402-02-3 (35℃)
BLEMMER®SA	Stearyl acrylate		Approx.30	4813-57-4 (30℃)
BLEMMER®VA	Behenyl acrylate (C_{22}：98%)		Approx.46	18299-85-9 (50℃)

(WARNING)

When melting solid monomer,avoid local heating. Heating temperature should not exceed 60℃.
Wait until monomer is completely melted before using.
In locally melted states, composition and distribution of polymerization inhibitor may not stay uniform.

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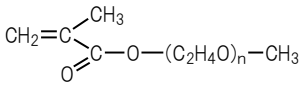
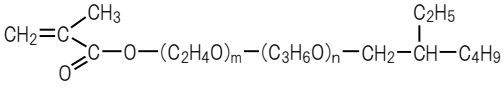
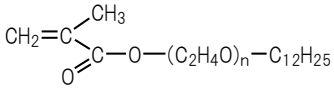
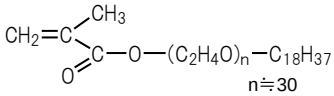
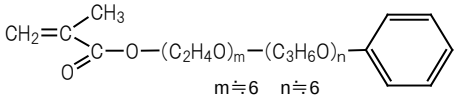
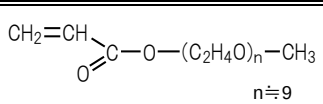
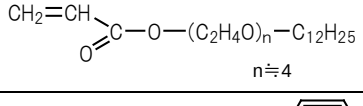
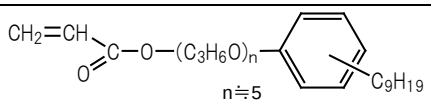
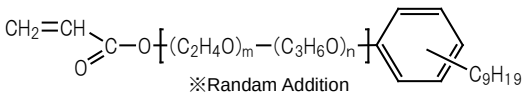
11. 6 POLYALKYLENE GLYCOL MOMO METHACRYLATE

Product Name	Chemical Name	Structural Formula	Melting Point (℃)	CAS No. (Tg:Polymer)
BLEMMER®PME-100	Methoxy -polyethyleneglycol -methacrylate	 PME-100 n=2 PME-200 n≒4 PME-400 n≒9 PME-1000 n≒23 PME-4000 n≒9	—	45103-58-0 (-26℃)
BLEMMER®PME-200			Approx.-15	26915-72-0 (-59℃)
BLEMMER®PME-400			-1～2	26915-72-0 (-60℃)
BLEMMER®PME-1000			Approx.35	26915-72-0 (-52℃)
BLEMMER®PME-4000 (Smoll-lot production)			Approx.54	26915-72-0 (-)
BLEMMER®50POEP-800B	Octoxy -polyethyleneglycol -polypropyleneglycol -methacrylate		—	146181-50-2 (-)
BLEMMER®PLE-200 (Smoll-lot production)	Lauroxy -polyethyleneglycol -methacrylate	 PLE-200 n≒4 PLE-1300 n≒30	—	Registered (-)
BLEMMER®PLE-1300 ※Production by Order			38.5	Registered (-)
BLEMMER®PSE-1300	Stearoxy -polyethyleneglycol -methacrylate	 n≒30	Approx.45	52352-43-9 (-51℃)
BLEMMER®43PAPE-600B ※Production by Order	Phenoxy -polyethyleneglycol -polypropyleneglycol -methacrylate	 m≒6 n≒6	—	197980-43-1 (-)

11. 7 POLYALKYLENE GLYCOL MOMO ACRYLATE

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®AME-400	Methoxy -polyethyleneglycol -acrylate	 n≒9	32171-39-4 (-65℃)
BLEMMER®ALE-200 (Smoll-lot production)	Lauroxy -polyethyleneglycol -acrylate	 n≒4	39927-09-8 (-16℃)
BLEMMER®ANP-300	Nonilphenoxy -polypropyleneglycol -acrylate	 n≒5	71926-19-7 (-39℃)
BLEMMER®75ANEP-600	Nonilphenoxy -poly (ethyleneglycol -propyleneglycol) -acrylate	 ※Randam Addition	115166-38-6 (-48℃)

(WARNING)

When melting solid monomer,avoid local heating. Heating temperature should not exceed 60℃.
Wait until monomer is completely melted before using.
In locally melted states, composition and distribution of polymerization inhibitor may not stay uniform.

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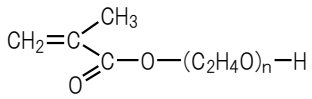
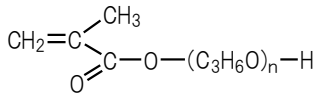
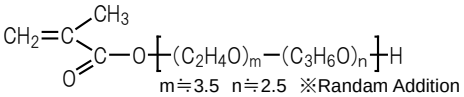
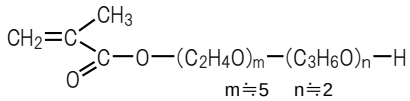
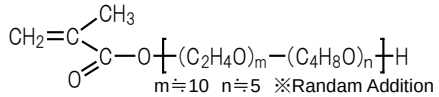
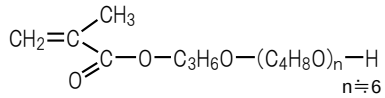
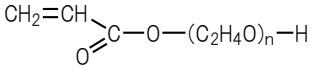
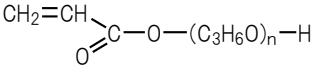
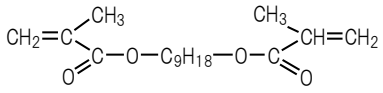
11. 8 POLYALKYLENE GLYCOL MOMO METHACRYLATE(-OH TERMINATED)

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®PE-90	Polyethyleneglycol methacrylate	 PE-90 n≒2 PE-200 n≒4.5 PE-350 n≒8	25736-86-1 (-)
BLEMMER®PE-200			25736-86-1 (-53℃)
BLEMMER®PE-350			25736-86-1 (-58℃)
BLEMMER®PE-350G	Polyethyleneglycol methacrylate (60% Aqueous solution)		
BLEMMER®PP-1000	Polypropyleneglycol methacrylate	 PP-1000 n≒4~6 PP-500 n≒4.5 PP-800 n≒8	39420-45-6 (-49℃)
BLEMMER®PP-500			39420-45-6 (-57℃)
BLEMMER®PP-800			39420-45-6 (-62℃)
BLEMMER®50PEP-300	Poly (ethyleneglycol-propyleneglycol) -methacrylate	 m≒3.5 n≒2.5 ※Randam Addition	58916-75-9 (-60℃)
BLEMMER®70PEP-350B	Polyethyleneglycol -polypropyleneglycol -methacrylate	 m≒5 n≒2	58916-75-9 (-60℃)
BLEMMER®55PET-800	Poly (ethyleneglycol -tetramethyleneglycol) -methacrylate	 m≒10 n≒5 ※Randam Addition	72514-28-4 (-66℃)
BLEMMER®10PPB-500B	Propyleneglycol-polybutyleneglycol -methacrylate	 n≒6	800379-55-9 (-)

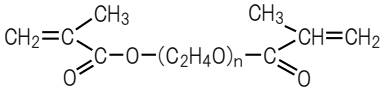
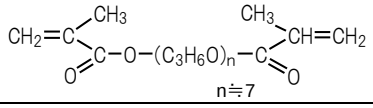
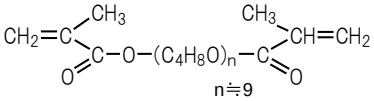
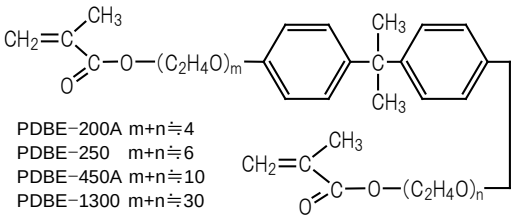
11. 9 POLYALKYLENE GLYCOL MOMO ACRYLATE(-OH TERMINATED)

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®AE-90U ※Under development	Polyethyleneglycol acrylate	 AE-90U n≒2 AE-200 n≒4.5 AE-400 n≒10	26403-58-7 (-49℃)
BLEMMER®AE-200			26403-58-7 (-54℃)
BLEMMER®AE-400			26403-58-7 (-64℃)
BLEMMER®AP-200 (Smoll-lot production)	Polypropyleneglycol acrylate	 AP-200 n≒3.5 AP-400 n≒6 AP-550 n≒9 AP-800 n≒13	50858-51-0 (-40℃)
BLEMMER®AP-400			50858-51-0 (-59℃)
BLEMMER®AP-550 ※Production by Order			50858-51-0 (-59℃)
BLEMMER®AP-800 ※Under development			50858-51-0 (-62℃)

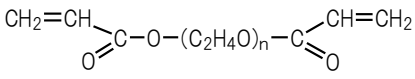
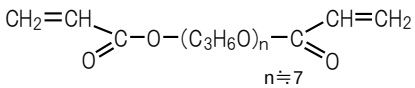
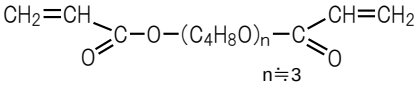
11. 10 ALKYL DIMETHACRYLATE

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®NDMA	1,9-Nonanediol dimethacrylate		65833-30-9 (-)

11. 11 POLYALKYLENEGLYCOL DIMETHACRYLATE

Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®PDE-100 (Smoll-lot production)	Polyethyleneglycol -dimethacrylate	 PDE-100 n=2 PDE-150 n=3 PDE-200 n≒4 PDE-400 n≒9 PDE-600 n≒14	25852-47-5 (-)
BLEMMER®PDE-150 (Smoll-lot production)			25852-47-5 (-)
BLEMMER®PDE-200			25852-47-5 (-)
BLEMMER®PDE-400			25852-47-5 (-9℃)
BLEMMER®PDE-600			25852-47-5 (-34℃)
BLEMMER®PDP-400N	Polypropyleneglycol -dimethacrylate	 n≒7	25852-49-7 (-11℃)
BLEMMER®PDT-650 (Smoll-lot production)	Polytetramethyleneglycol -dimethacrylate	 n≒9	28883-57-0 (-53℃)
BLEMMER®PDBE-200A	Ethoxylated bisphenol A -dimethacrylate	 PDBE-200A m+n≒4 PDBE-250 m+n≒6 PDBE-450A m+n≒10 PDBE-1300 m+n≒30	41637-38-1 (105℃)
BLEMMER®PDBE-250 ※Production by Order			41637-38-1 (88℃)
BLEMMER®PDBE-450A			41637-38-1 (17℃)
BLEMMER®PDBE-1300 ※Production by Order			41637-38-1 (-38℃)

11. 12 POLYALKYLENEGLYCOL DIACRYLATE

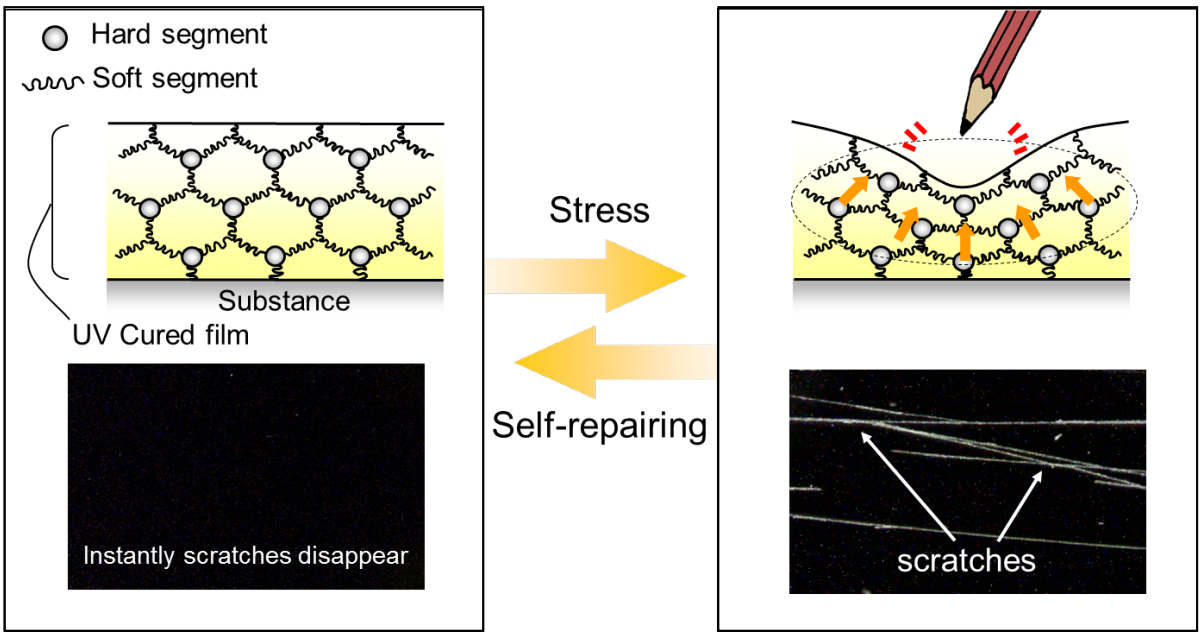
Product Name	Chemical Name	Stuructural Formula	CAS No. (Tg:Polymer)
BLEMMER®ADE-200	Polyethyleneglycol diacrylate	 ADE-200 n≒4 ADE-300 n≒7 ADE-400A n≒9	26570-48-9 (50℃)
BLEMMER®ADE-300			26570-48-9 (-)
BLEMMER®ADE-400A			26570-48-9 (-23℃)
BLEMMER®ADP-400	Polypropylenglycol diacrylate	 n≒7	52496-08-9 (-18℃)
BLEMMER®ADT-250 (Smoll-lot production)	Polytetramethyleneglycol -diacrylate	 n≒3	52277-33-5 (-)

12. URETHANE ACRYLATE

Product Name	Properties				Cured film properties		
	Molecular Weight	Functional group	Viscosity (25℃)(mPa・s)	Refractive index (20℃)	Pencil hardness (Base:PET)	Tg：Polymer (℃)	Tensile elongation (%)
BLEMMER®DA-800AU	1,100	2	1,500	1.477	6B	−30	50
BLEMMER®DA-400AU ※Under development	800	2	1,100	1.480	3B	−20	40
BLEMMER®TA-604BU2	2,300	3↑	12,000	1.490	B	10	100
BLEMMER®TA-604AU	2,000	3↑	20,000	1.491	HB	5	50
BLEMMER®TA-454AU	1,600	3↑	30,000	1.487	HB	10	60

Characteristic

- Very high cure speed
- Good flexibility and elasticity
- Cured films of **TA-604BU2、TA-604AU、TA-454AU** show “Self-repairing” that means slight scratches are instantly repaired.



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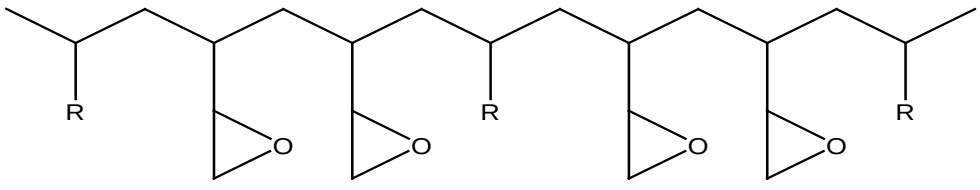
13.POLYMER with GLYCIDYL METHACRYLATE

Product Name	Appearance	Category	Molecular Weight	Tg (℃)	Epoxy Equivalent (g/eq.)
MARPROOF®G-0105SA	Flake	Copolymer with styrene	10,000	90	3,000
MARPROOF®G-0130SP	Powder	Copolymer with styrene	9,000	69	530
MARPROOF®G-0150M	Powder	(Meth)Acrylic polymer	10,000	71	310
MARPROOF®G-0250SP	Powder	Copolymer with styrene	20,000	74	310
MARPROOF®G-1005S	Powder	Copolymer with styrene	100,000	96	3,300
MARPROOF®G-1005SA (Smoll-lot production)	Powder	Copolymer with styrene	100,000	98	3,300
MARPROOF®G-1010S ※Production by Order	Powder	Copolymer with styrene	100,000	93	1,700
MARPROOF®G-2050M	Powder	(Meth)Acrylic polymer	200,000～250,000	74	340
MARPROOF®G-01100	Flake	(Meth)Acrylic polymer	12,000	47	170
MARPROOF®G-017581 ※Under development	Block	(Meth)Acrylic polymer	10,000	0↓	240
MARPROOF®GP-012024 ※Under development	Viscous Liquid	Hydrophilic polymer	10,000	-40	730

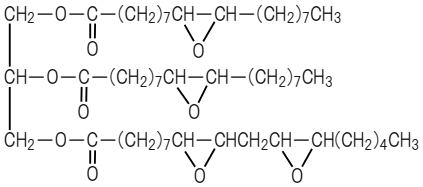
Characteristic

MARPROOF®series improve adherance, 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,vinilidene chloride resin and so on.



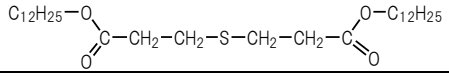
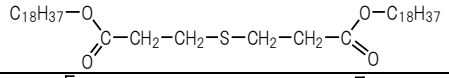
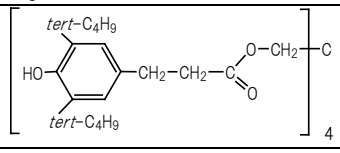
Epoxy Emulsion
(Solid content 50%)
GP-012024

14. EPOXIDIZED SOYBEAN OIL

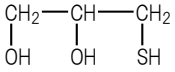
Product Name	Appearance	Structural Formula	Oxyran Oxygen (%)	Melting Point (℃)
NEWCIZER®510R	Light Yellow Viscous Liquid		6.7↑	5

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

15.ANTIOXIDANT

Product Name	Appearance	Chemical Name	Structural Formula	Melting Point (℃)
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-*t*-butyl-4-hydroxy -phenyl)-propionate]		120

16.POLYMERIZATION MODIFIER

Product Name	Appearance	Chemical Name	Structural Formula	Freezing Point (℃)
N-DODECYL MERCAPTAN	Colorless Liquid	n-Dodecyl mercaptan	$C_{12}H_{25}-SH$	-7
BLEMMER®TGL (Smoll-lot production)	Clear Viscous Liquid	1-Thioglycerol		—
NOFMER®MSD ※Functional Chemicals & Polymers Division	Clear Liquid	α-Methylstyrene dimer	—	—

17.ANTISTATIC AGENT

17.1 MASTER BATCH POWDER TYPE (For Flexible PVC,PS, ABS, EVA)

Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/□) [20℃, Humidity 50%]	Dilution Agent	Melting Point (℃)
ELEGAN®C-709P	Light Yellow Powder	Cationic	Flexible PVC 1.0% added 8.0 x 10^{11}	PVC (75%)	—
NEW ELEGAN®ASK	Light Yellow Powder		Flexible PVC 0.3% added 3.2 x 10^{10} Flexible PVC 0.6% added 1.9 x 10^{10}	PVC・WAX (60%)	60
FARPACK Z-MK	Light Yellow Powder	Anionic	Flexible PVC 1.0% added 4.0 x 10^{11} ABS 1.0% added 5.0 x 10^{11} EVA 0.5% added 2.0 x 10^{10}	Industrial pure materials	Approx.70
ELEGAN®N-119	Light Yellow Powder	Nonionic	LDPE 1.0% added 5.0 x 10^{12}	Silica (30%)	Approx.60

17.2 MASTER BATCH LIQUID TYPE (For Flexible PVC)

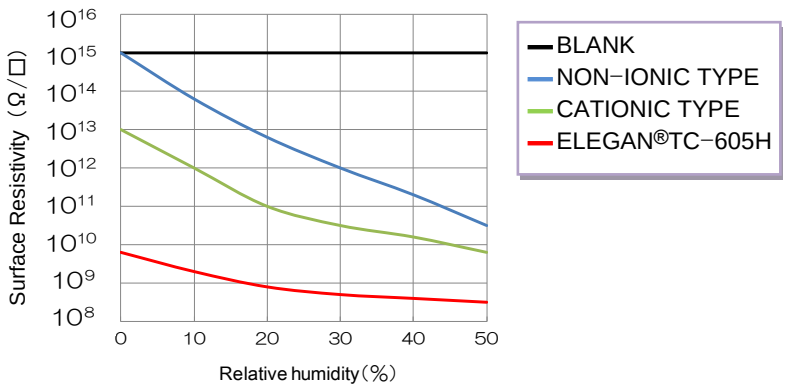
Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/□) [20℃, Humidity 50%]	Dilution Agent	Flash Point (℃)
NEW ELEGAN®B (Smoll-lot production)	Yellow～Dark Brown Liquid	Cationic	Flexible PVC 0.3% added 2.8 x 10^{10} Flexible PVC 0.6% added 1.5 x 10^{10}	IPA (30～40%)	18.0
NEW ELEGAN®AI	Yellow～Dark Brown Liquid		Flexible PVC 0.3% added 4.6 x 10^{10} Flexible PVC 0.6% added 2.2 x 10^{10}	IPA (30～40%)	19.5
NEW ELEGAN®C	Yellow～Dark Brown Liquid		Flexible PVC 0.6% added 3.0 x 10^{10} Flexible PVC 1.0% added 6.0 x 10^{11}	IPA (25%)	18.7
ELEGAN®LD-204	Clear～Light Yellow Liquid		Flexible PVC 1.0% added 8.0 x 10^{11}	Industrial pure materials	152

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

Product Name	Appearance	Ionicity	Main Use	Dilution Agent	Pour Point (℃)
ELEGAN®264WAX	White～Light Yellow Viscous Paste	Cationic (Halogen Free)	For Ink, Polyurethane, Acrylic resin	Industrial pure materials	50～55
ELEGAN®C-606 (Smoll-lot production)	Light Yellow Viscous Liquid	Cationic	For Rubber	Industrial pure materials	—
ELEGAN®C-607L (Smoll-lot production)	Light Yellow Viscous Liquid	Cationic (Halogen Free)	For Acrylic resin	Industrial pure materials	—

17.4 SURFACE COATING TYPE

Product Name	Appearance	Ionicity	Surface Resistivity (Example) (Ω/□) [20℃, Humidity 50%]	Dilution Agent	Flash Point (℃)
ELEGAN®264WAX	White～Light Yellow Viscous Paste	Cationic (Halogen Free)	1.6 x 10^{8} (x 100 Dilution with water)	Industrial pure materials	175
ELEGAN®264-30	Light Yellow Liquid		1.6 x 10^{8} (x 30 Dilution with water)	Water (70%)	No. existence
ELEGAN®TA-100	Light Yellow Liquid	Anionic	7.4 x 10^{8} (x 60 Dilution with water)	Water	No existence
ELEGAN®T-4530 (Smoll-lot production)	Light Yellow Liquid (Turbid in Winter)		2.5 x 10^{10} (x 30 Dilution with water)	Water (70%)	No existence
ELEGAN®TC-605	Light Yellow Liquid	Cationic (Halogen Free)	4.2 x 10^{8} (x20 Dilution with water) ＊**Low humidity dependence**	Water	No existence
ELEGAN®TC-605H (Smoll-lot production)	Light Yellow Liquid		2.4 x 10^{8} (x20 Dilution with water) ＊**Low humidity dependence**	Water	No existence

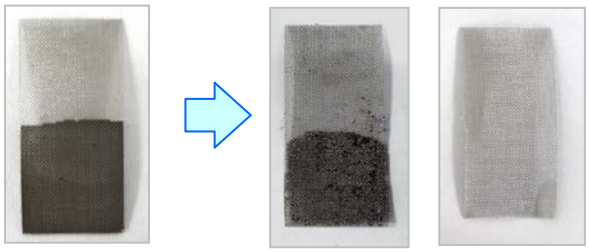


18. INDUSTRIAL DETERGENT

18. 1 NEUTRAL DETERGENT for METAL

Product Name	Appearance	Viscosity (mPa·s)		pH (1.0wt% aq.)	Specific gravity (25/4℃)	Main use
		0℃	20℃			
FALCORAN DM-1 ※Under development	Clear Liquid	10	7	7.0～8.0	1.0	Grease stains Oil stains

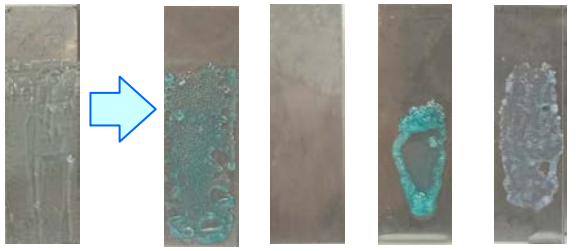
Cleaning test (asphalt)



- Conditions: 10-fold dilutions
- Coated with an asphalt solution to the wire netting of 100 mesh and dries the test pieces.
- Ultrasonic cleaning for 20 minutes after immersing the test piece in the cleaning agent.

Dirt on fine parts like wire mesh.

Cleaning test (silicone grease)



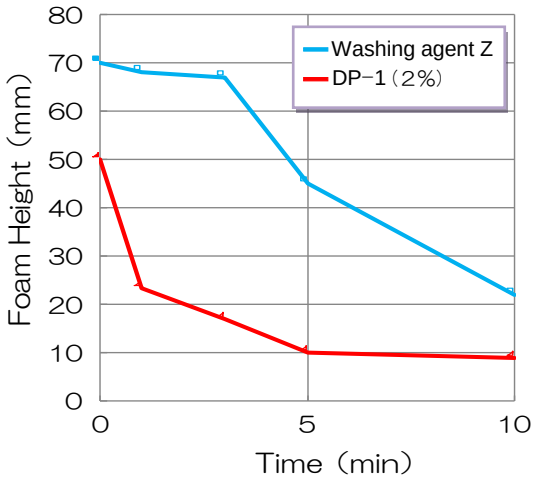
- Conditions: 2-fold dilutions
- Coated with a silicone grease to a stainless steel test pieces.
- Ultrasonic cleaning for 30 minutes after immersing the test piece in the cleaning agent.

It can wash out a high viscosity oil.

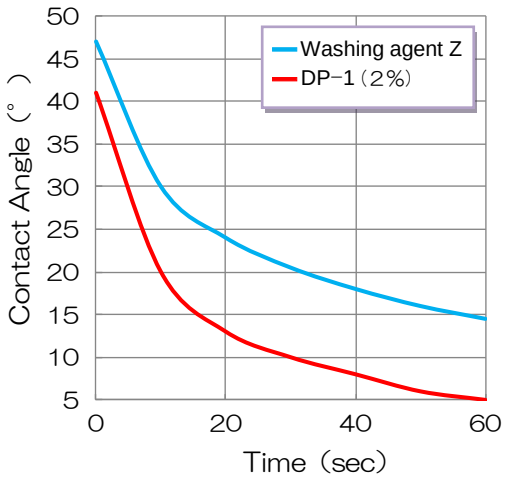
18. 2 NEUTRAL DETERGENT for RESIN and GLASS

Product Name	Appearance	Viscosity (mPa·s)		pH (1.0wt% aq.)	Specific gravity (25/4℃)	Main use
		0℃	20℃			
FALCORAN DP-1	Clear Liquid	13	11	6.5～7.5	1.0	Mineral stains

Low foam detergent



Wettability



19. FOR CONSTRUCTION & BUILDING MATERIALS

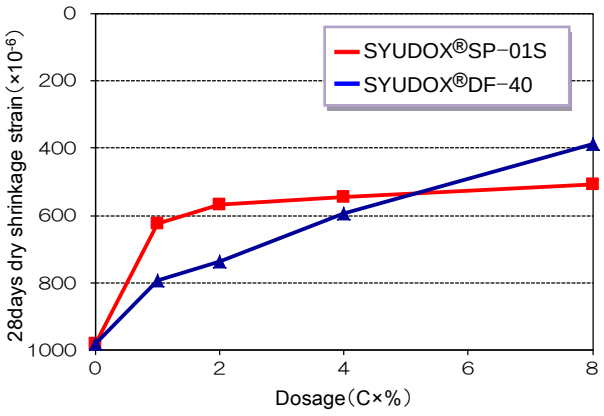
19. 1 CONCRETE AGENT

Product Name	Appearance	Chemical Name	Main Application
MALIALIM®A-20	Clear～Light Yellow Liquid	Polycarboxylic acid type	Water reducing agent for concrete
MALIALIM®CL-100	Yellow～Dark Brown Viscous Liquid		Reduction of methylcellulose
SYUDOX®DEF-001	Clear～Light Yellow Liquid	—	Defoaming agent
SYUDOX®DSP-2508	Clear～Light Yellow Liquid	Polyoxyalkylene type	Reducing of drying shrinkage
SYUDOX®SG-413	Clear～Light Yellow Liquid		

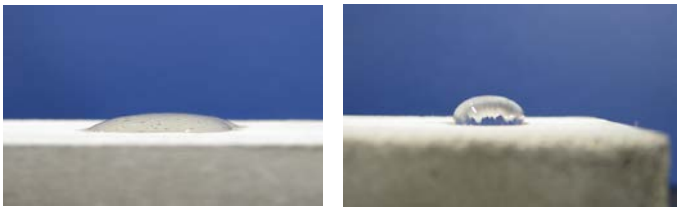
19. 2 PREMIX MORTAR CONCRETE AGENT

Product Name	Appearance	Chemical Name	Main Application
SYUDOX®WR-301CP	Light Yellow Powder	Polycarboxylic acid type	Water reducing agent for concrete
SYUDOX®WRP-150A	Light Yellow Powder		
SYUDOX®DEF-001-CS	White Powder	—	Defoaming agent
SYUDOX®PRF-C180	White Fine Powder	Special Metallic soap type	Water & oil repellent agent
SYUDOX®PRF-A180	White Fine Powder		
SYUDOX®PR-30RS	White Fine Powder		
SYUDOX®PR-11LS	White Powder		
SYUDOX®DSP-E40	White Powde	Polyoxyalkylene type	Reducing of drying shrinkage
SYUDOX®DF-40	White Powde		
SYUDOX®SP-01S	White Flake	Polyoxyalkylene type (SiO_2 dilution)	

Dosage dependence of dry shrinkage reducing agents



Water & oil repellent



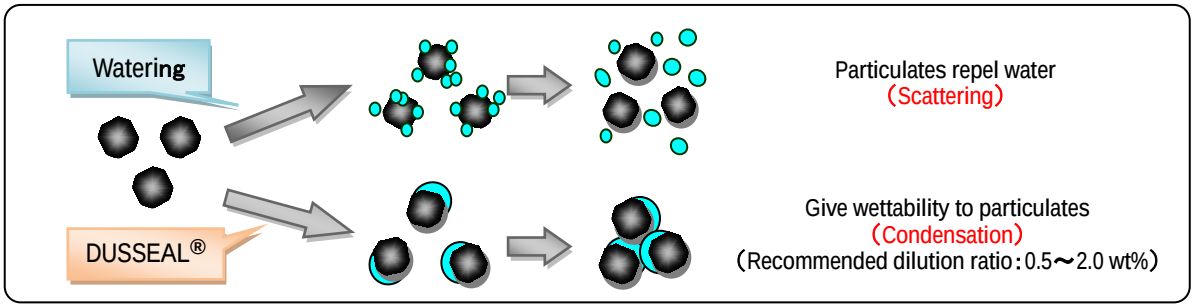
Blank　　Waterproofing agents（SYUDOX®PR-30RS）

3/24/2017

19. 3 DUST & COAL DUST CONTROL AGENT

Product Name	Appearance	Chemical Name	Viscosity (mPa・s)		pH (1.0wt% aq.)	Specific gravity (25/4℃)	Pour Point (℃)
			0℃	20℃			
DUSSEAL®F-10	Clear Viscous Liquid	・Natural fats derivatives ・Surfactant etc. (mixture)	550	150	7.2	1.1	−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.

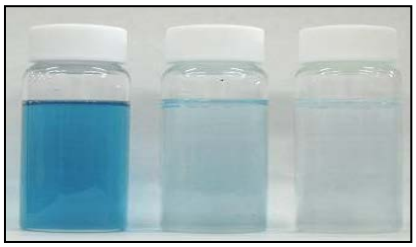


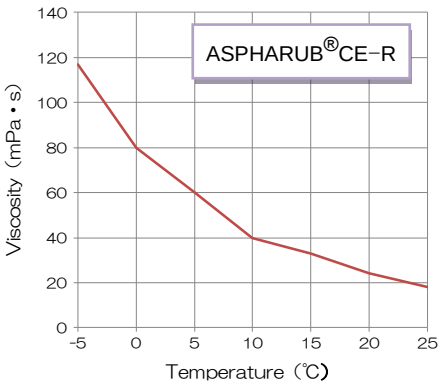
19. 4 ASPHALT RELEASE AGENT

Product Name	Appearace	Chemical Name	Freezing Point (℃)	Dilution degree with water			Flash Point (℃)
				Plant	Dunp truck	Tire roller	
ASPHASOL®N-02 (Smoll-lot production)	Red Clear Viscous Liquid	・Natural fats derivatives ・Surfactant etc. (mixture)	−20↓	x 7	x 10	x 50	No existence
ASPHARUB®CE-R	Blue Clear Viscous Liquid		Approx.−12	x 15	x 15	x 50	No existence

Release ability

Stability of water solution

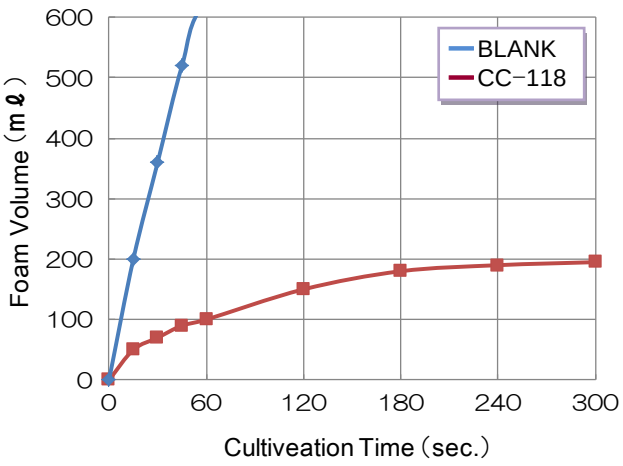


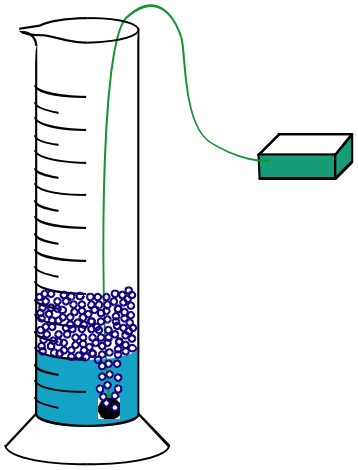


20.DEFOAMING AGENT

Product Name	Appearance	Main Application	Solubility in water	Cloud Point (℃)	Viscosity(40℃) (mm^2/s)
DISFOAM®CA-104C	Clear～Light Yellow Liquid	PVA, PEO, Acryl	Insoluble	0↓	20
DISFOAM®NQH-7403	Clear～Light Yellow Liquid	Medium, Antibiotics	Insoluble	0↓	70
DISFOAM®FDS-2224	Clear～Light Yellow Liquid	Paper making, Slate, Water treatment, Fermentation	Dispersion	0↓	170
DISFOAM®NKL-5450	Clear～Light Yellow Liquid	Paper making, Slate, Water treatment, Fermentation	Dispersion	0↓	180
DISFOAM®EMF-607	Yellow Liquid	Sewage disposal, Stock breeding, Water treatment	Emulsifiction	0↓	40
DISFOAM®CC-130B (Smoll-lot production)	Clear～Light Yellow Liquid	Sewage disposal, Stock breeding, Fermentation (Yeast), Water treatment	Dispersion	5↓	210
DISFOAM®CC-118	Clear～Light Yellow Liquid	Sewage disposal, Stock breeding, Fermentation (Yeast), Water treatment	Dispersion	5	150
DISFOAM®CC-118WS (Smoll-lot production)	Clear～Light Yellow Liquid	Sewage disposal, Stock breeding, Fermentation (Yeast), Water treatment	Soluble	5.5	186
DISFOAM®CA-123	Clear～Light Yellow Liquid	Fermentation, Glutamic acid, Antibiotics	Dispersion	9	380
DISFOAM®CA-330	Clear～Light Yellow Liquid	Fermentation	Dispersion	12	240
DISFOAM®CB-442	Clear～Light Yellow Liquid	Fermentation, Aqeous high molecular solution,Antibiotics	Dispersion	15	300
DISFOAM®CE-457	Clear～Light Yellow Liquid	PVA, Starch, HPC, HMPC	Dispersion	15	400
DISFOAM®CA-220	Clear～Light Yellow Liquid	Fermentation	Dispersion	18	160
DISFOAM®CC-438	Clear～Light Yellow Liquid	Fermentation, CO_2Gas, Aqeous high molecular solution	Dispersion	18	280
DISFOAM®CC-222	Clear～Light Yellow Liquid	Fermentation, Carbonic acid absorbent, Aqeous high molecular solution	Dispersion	20	190
DISFOAM®CC-218	Clear～Light Yellow Liquid	Drain treatment	Dispersion	23	170
DISFOAM®CD-432	Clear～Light Yellow Liquid	Paper making	Soluble	25	270
DISFOAM®CK-140	Clear～Light Yellow Liquid	Latex, CO_2 absorpion solution, Aqeous high molecular solution	Soluble	48	1,100
DISFOAM®BF-33	Yellow Viscous Liquid	Aqeous high molecular solution	Dispersion	—	35
DISFOAM®BC-51Y	Yellow Liquid	Fermentation	Dispersion	—	25
DISFOAM®FD-2 (Food Additive)	Light Yellow Viscous Liquid	Food product	Dispersion	3	1,200 (30℃)

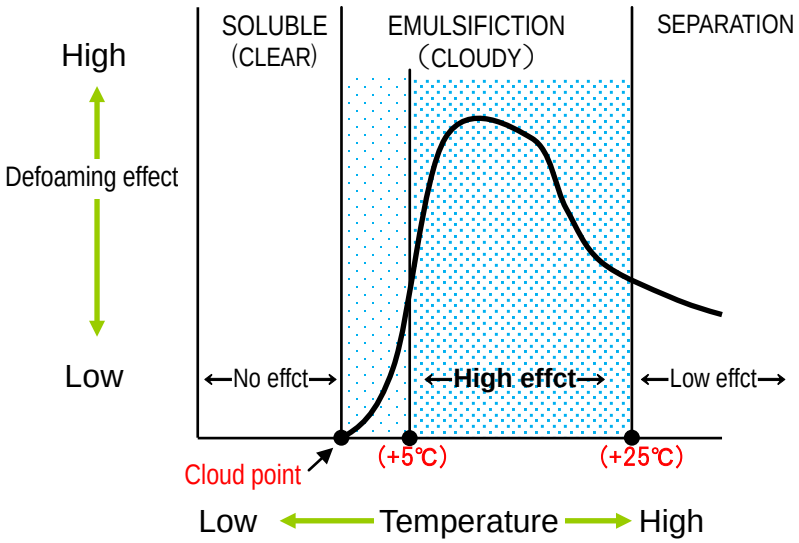
Test method (defoaming agent)





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

Effect to defoam



- The antifoaming agent is water-soluble in lower than clouding point. The defoaming 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.

COMPREHENSIVE CATALOGUE

Handling for contents of mention

The item mentioned here doesn't assure contents of mention, but has a purpose to offer an information based on the materials, information and data which could obtain at present. And deal with it when you take safety countermeasures in all the users' responsibility when you do special handling because usual handling is being made the target.

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