

Saturated Complex Esters for use in Ecolabelled Lubricants



Biodegradable Hydraulic Fluids (Ecolabel)

PHYSICAL PROPERTIES		KETJENLUBE	KETJENLUBE	KETJENLUBE
		9200	9201	9202
Item	Test-Method	Typical Values		
Appearance	Visual	Clear Liquid	Clear Liquid	Clear Liquid
Viscosity 40°C (mm ² s)	ASTM D-445	32	45	60
Viscosity 100°C (mm ² s)	ASTM D-445	6.8	8	9.2
Viscosity index	ASTM D-2270	170	150	130
Acid Number (mgKOH/g)	ASTM D-974	0.1	0.1	0.1
Pour Point	ASTM D-97	-52°C	-56°C	-40°C
Flash Point	ASTM D-92	230°C	230°C	230°C
Colour Gardner	ASTM D 1544	5	5	5
Iodine Number (mgI ₂ /100g)	in-house	<2	<2	<2
Biodegradability	OECD 301B	>70 %	>70 %	>70 %
% of Renewable Carbon	/	>78 %	>75 %	>72 %





	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour Point	Hydroxyl value	Iodine value	Demulsivity test	Others
Method of analysis		ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554	ASTM D1401	
Units	Gardner	mgKOH/g	mgKOH/g	Kg/dm ³	mm ² /s	°C	mgKOH/g	gl ² /100g	Min-cc/cc/cc	
Approved in Arese										
Dapralube EO	2 max.	0.5 max.	140-146	0.860-0.870	8-9	<-30	3 max.	54-64		
Dapralube TO	6 max.	2 max.	180-200	0.913-0.928	40-50	<-30	17 max.	77-87	30min 46/37/3	
Armotan MRD	10 max.	7 max.	145-165				190-215			
Dapralube TO (vegetable based)	6 max.	2 max.	180-200	0.913-0.928	40-50	<-30	8 max.		30min 46/37/3	
Dapralube PET	6.5 max.	2 max.	183-193	0.876-0.924	58-65	<-19	10 max.	85-95		
Dapralube GMO	6.5 max.	4 max.	155-175		90-100	10 max.		75-90		Glycerine 5% max. Moisture 1.5% max.
Dapralube IBS	1 max.	1 max.	165-175	0.804-0.853	4-10	<18		1 max.		
Dapralube IPO	5 max.	0.2 max.	170-180	0.860-0.920	4-10	<-20	1 max.	76-88		
Dapralube PGDO	5.5 max.	2 max.	175-190	0.860-0.920	15-22	<-15		84-92		
Dapralube SMO	8 max.	8 max.	145-160		380-400		193-210	65-75		
Dapralube STO	8 max.		170-190		124-145		55-75	75-85		
Dapralube GDO	5 max.	4 max.	170-185		40-50	5 max.		100-115		Glycerine 1,5% Mono-glycerides 15-20
Dapralube BS	1 max.	0.1 max.	165-175	0.804-0.853	5-9	<20	1 max.	1 max.		
Dapralube PET (vegetable based)	6.5 max.	2 max.	183-193	0.876-0.924	58-65	<-19	10 max.	85-95		

TRIMETHYLOLPROPANE ESTERS

	Chemical description	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour point	Hydroxyl value	Iodine value
Method of analysis			ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554
Units		Gardner	mgKOH/g	mgKOH/g	kg/dm ³	mm ² /s	°C	mgKOH/g	g ₂ /100g
DAPRALUBE TO	Trimethylolpropane Trioleate	6 MAX.	2 max.	180-200	0.913-0.928	Dynamic 41,4-50,6	<-30	17 max.	77-87
DAPRALUBE TO-V	Trimethylolpropane Trioleate Vegetable	6 MAX.	2 max.	180-200	0.913-0.928	Dynamic 41,4-50,6	<-30	8 max.	
DAPRALUBE TO-HP	Trimethylolpropane Trioleate	6 MAX.	2 max.	180-200	0.913-0.928	Dynamic 41,4-50,6	<-39		77-87
DAPRALUBE TO-5	Trimethylolpropane Trioleate	6 MAX.	0.5 max.	180-200	0.913-0.928	Dynamic 41,4-50,6	<-30	10 max.	
DAPRALUBE TO-5-V	Trimethylolpropane Trioleate Vegetable	6 MAX.	0.5 max.	180-200	0.913-0.928	Dynamic 41,4-50,6	<-30	10 max.	
DAPRALUBE TO-12	Trimethylolpropane Trioleate	6 MAX.	2 max.		0.913-0.928	Dynamic 42,0-50,0	<-39	10-14 max.	
DAPRALUBE TO-68	Trimethylolpropane Trioleate	6 MAX.	1.5 max.	180-210		Dynamic 61,0-65,0	<-30	15 max.	72-91
DAPRALUBE TO-S	Trimethylolpropane Trioleate	6 MAX.	2 max.	180-200		Dynamic 80,0-90,0	10 Typical		40-50
DAPRALUBE TO-S-V	Trimethylolpropane Trioleate Vegetable	6 MAX.	2 max.	180-200		Dynamic 80,0-90,0	10 Typical		40-50

SORBITAN ESTERS

	Chemical description	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour point	Hydroxyl value	Iodine value
Method of analysis			ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554
Units		Gardner	mgKOH/g	mgKOH/g	kg/dm ³	mm ² /s	°C	mgKOH/g	g ₂ /100g
DAPRALUBE SMO	Sorbitan oleate	8 MAX	8 MAX	145- 160				193-210	65-75
DAPRALUBE SMO-E	Sorbitan oleate	7 MAX	10 MAX	145 -165				195-225	70-80
DAPRALUBE STO	Sorbitan trioleate	8 MAX.	10-15	170-190				55-70	75-85
ARMOTAN	Sorbitan Monooleate	10 max.	7 max.	145-165				190-215	

GLYCEROL ESTERS

	Chemical description	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour point	Hydroxyl value	Iodine value
Method of analysis			ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554
Units		Gardner	mgKOH/g	mgKOH/g	Kg/dm ³	mm ² /s	°C	mgKOH/g	gI ₂ /100g
DAPRALUBE GMO	Glycerol mono oleate	6.5 max.	4 max.	155-175			10 max.		75-90
DAPRALUBE GMO-7	Glycerol mono oleate	6.5 max.	0.5 max.	165-175	0,940-0,960		0 max.		71-81
DAPRALUBE GDO	Glycerol Di oleate	5 max	4 max.	170-185			5 max.		100-115

MONOALCOHOL ESTERS

	Chemical description	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour point	Hydroxyl value	Iodine value
Method of analysis			ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554
Units		Gardner	mgKOH/g	mgKOH/g	Kg/dm ³	mm ² /s	°C	mgKOH/g	gI ₂ /100g
DAPRALUBE IBS	Iso Butyl Stearate	1 max.	1 max.	165-175	0.804-0.853		<18		1 max
DAPRALUBE BS	Butyl Stearate	1 max.	0.5 max.	165-175	0.804-0.853		<20	1 max	1 max.
DAPRALUBE IPO	Isopropyl Oleate vegetable	5 max.	0.2 max.	170-180	0.860-0.920		<-20	1 max	76-88
DAPRALUBE EO	2-ETHYL Hexyl Oleate	2 max.	0,5 max	140-146	0,860-0,870		<-30	3 max.	54-64
DAPRALUBE EO-V	2-ETHYL Hexyl Oleate vegetable	2 max.	0,5 max	140-146	0,860-0,870		<-30	3 max.	54-64
DAPRALUBE PGDO	Propylene Glycol Dioleate vegetable	5.5 max.	2 max	175-190	0.860-0.920		<-15		84-92

PENTAERYTHRITOL ESTERS

	Chemical description	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour point	Hydroxyl value	Iodine value
Method of analysis			ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554
Units		Gardner	mgKOH/g	mgKOH/g	Kg/dm ³	mm ² /s	°C	mgKOH/g	gI ₂ /100g
DAPRALUBE PET	Pentaerythritol Tetraoleate	6.5 max	2 max.	183-193	0.876-0.924		<-19	10 max.	85-95
DAPRALUBE PET-V	Pentaerythritol Tetraoleate vegetable	6.5 max	2 max.	183-193	0.876-0.924		<-19	10 max.	85-95
DAPRALUBE PET-H	Pentaerythritol Tetraoleate vegetable	6.5 max	10 max.	183-193	0.876-0.924		<0	20 max.	76-86

POLYETHYLENE GLYCOL ESTERS

	Chemical description	Colour	Acidity Value	Saponification Value	Specific Gravity 20°C	Viscosity at 40°C	Pour point	Hydroxyl value	Iodine value
Method of analysis			ASTM D974	ASTM D94	ASTM D1298	ASTM D445	ASTM D97	ASTM D1957	ASTM D5554
Units		Gardner	mgKOH/g	mgKOH/g	Kg/dm ³	mm ² /s	°C	mgKOH/g	gI ₂ /100g
DAPRALUBE P400DO	PEG 400 Dioleate	6 max	5 max	110-120					46-54