LUCANT™

Mitsui Chemicals

NOTICE: All data in this brochure are typical, not guaranteed.

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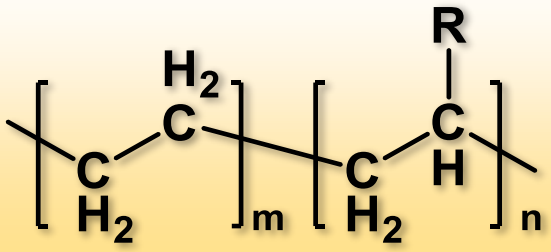
What is LUCANT™?

LUCANT™ is an ethylene/α-olefin based synthetic oil.

Chemical structure



Features of LUCANT™

- ✓ Non-polar
- ✓ Wide range of viscosity
- ✓ Amorphous
- ✓ Silicon free
- ✓ Solvent free (Solvent cont. <0.1wt%)
- ✓ Chemically stable (heat, oxidation, etc.)

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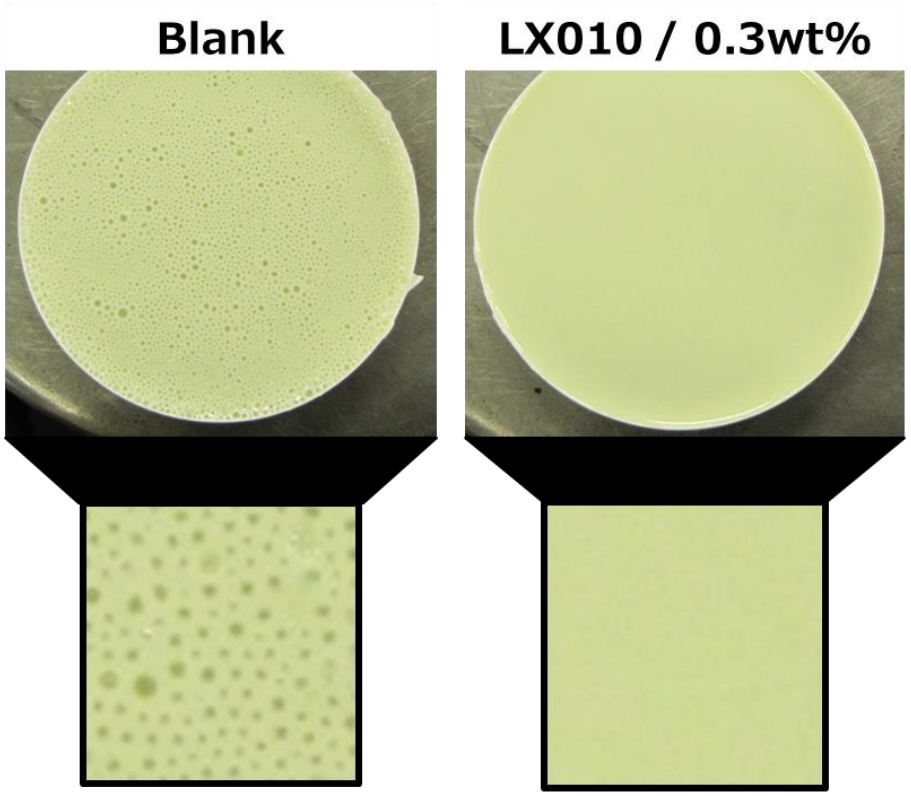
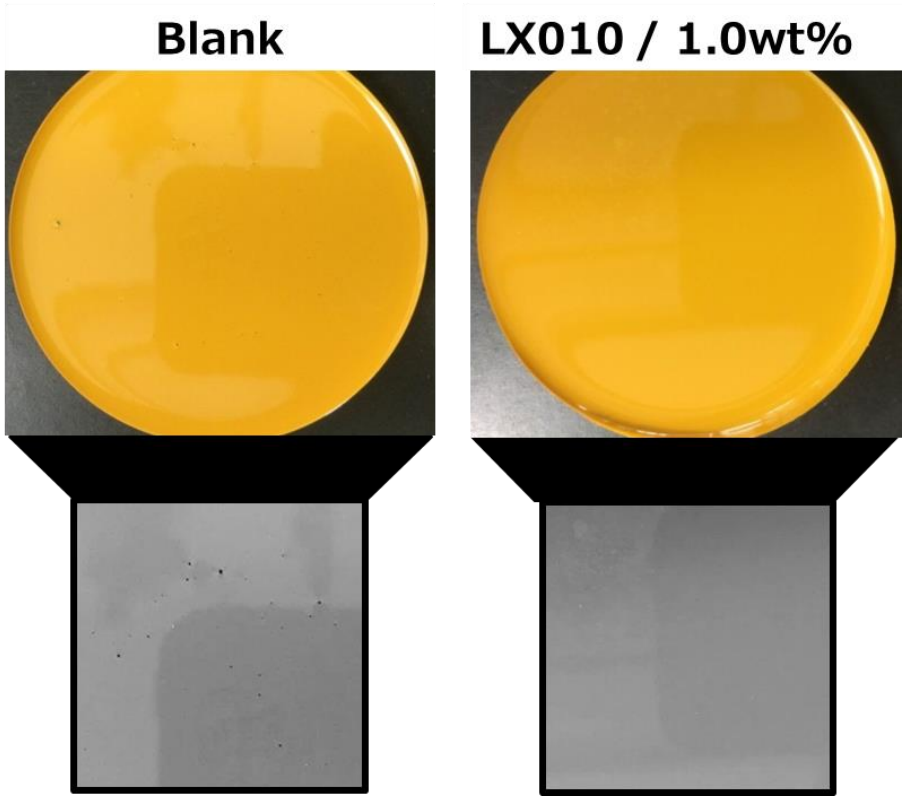
Performance as defoamer

LUCANT™ performs as an excellent defoamer in coating applications.

Urethane system



Epoxy system



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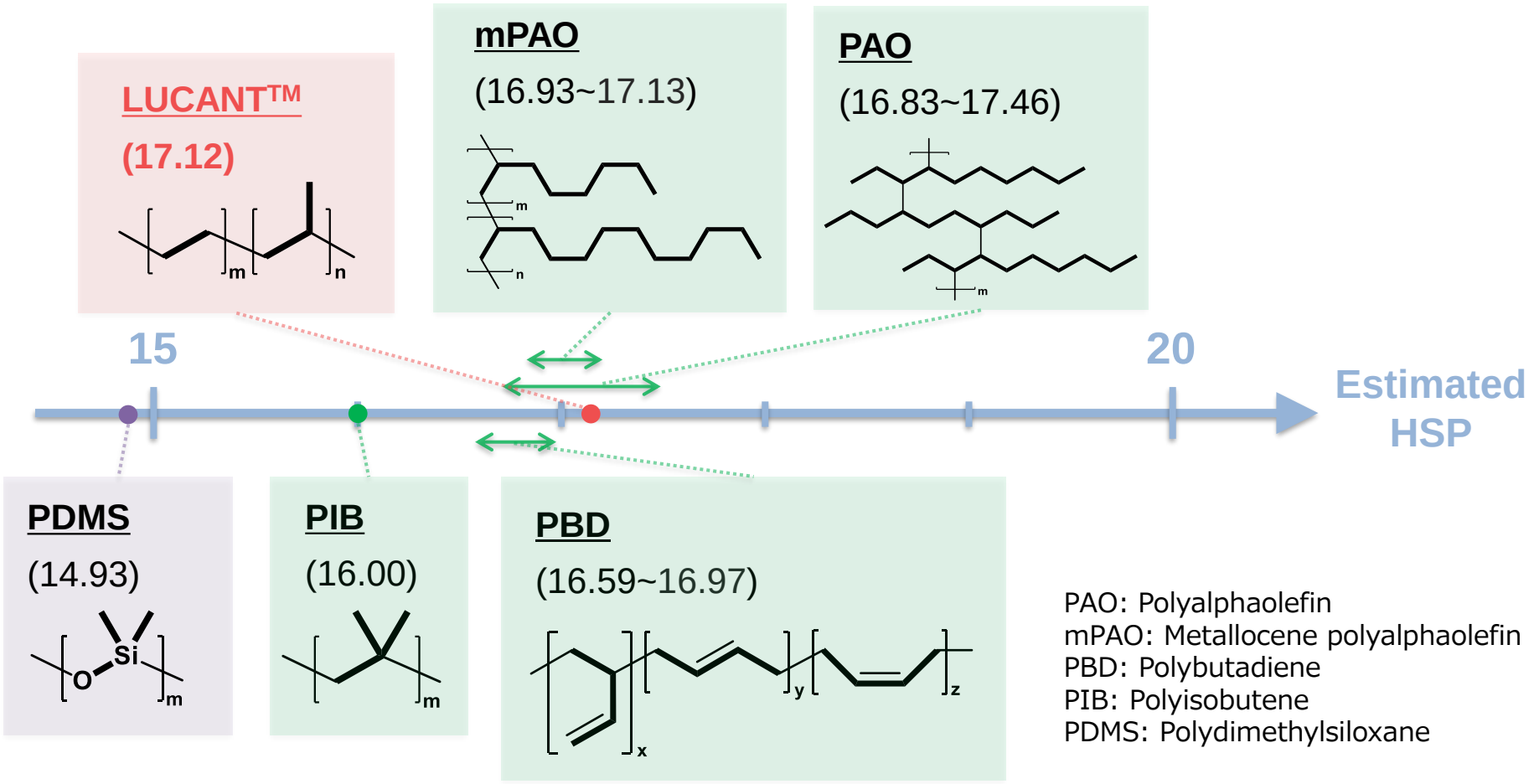
Estimated Hansen solubility parameter (HSP)

Calculation: Y-MB method



PAO: Polyalphaolefin
mPAO: Metallocene polyalphaolefin
PBD: Polybutadiene
PIB: Polyisobutene
PDMS: Polydimethylsiloxane

LUCANT™ has the same HSP as PAO and PBD.

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Estimated defoaming mechanism

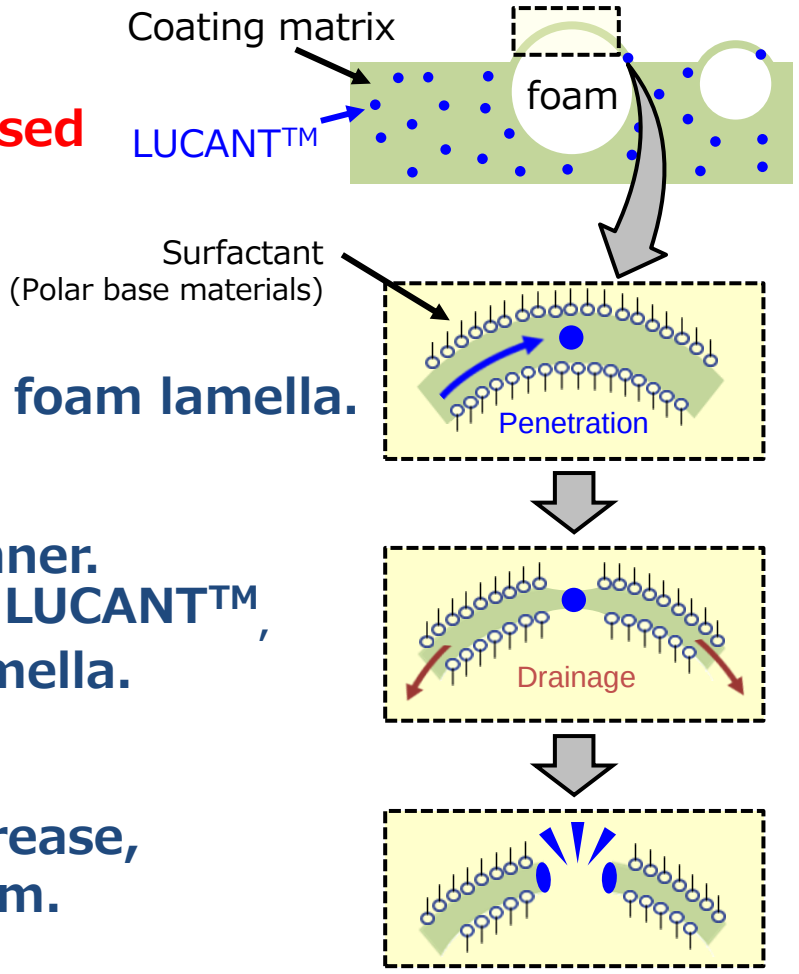
LUCANT™, non-polar and wide range of viscosity, perform as an excellent defoamer in coating.

①LUCANT™ is finely dispersed in coating matrix.

②LUCANT™ penetrates the foam lamella.

③The lamella becomes thinner. Surfactant is replaced by LUCANT™, which destabilizes the lamella.

④The lamella strength decrease, resulting on breaking foam.



Properties of LUCANT™

			LX004	LX010	LX020	LX100	LX200	LX400	LX900Z
Appearance	—	—	C&B*1	C&B*1	C&B*1	C&B*1	C&B*1	C&B*1	Pale white
Molecular weight (GPC, PSt. Std.)	Mw	—	2,700	4,200	5,000	8,700	11,000	12,500	15,600
	Mn		1,700	2,500	2,900	4,700	5,500	6,600	7,400
	Mw/Mn		1.5	1.6	1.7	1.8	1.9	1.9	2.1
Viscosity (Brookfield)	25°C	mPa·s	820	3,000	6,100	26,000	52,000	100,000	190,000
	100°C		30	80	120	480	880	1,600	2,800
Kinematic viscosity	40°C	mm^2/s	400	1,300	2,200	9,800	18,900	37,500	>50,000
	100°C		40	100	150	600	1,100	2,000	3,300
Density	15°C	kg/m^3	838	843	846	850	850	851	853
Tm*2	DSC	°C	N.D.*3	N.D.*3	N.D.*3	N.D.*3	N.D.*3	N.D.*3	−2
Tg*4	DSC	°C	−77	−71	−69	−66	−65	−64	−62

*1 C&B: clear and bright, *2 Tm: melting point, *3 N.D.: not detected, *4 Tg: glass transition point

LUCANT™ covers broad range of molecular weight and viscosity.

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Properties of LUCANT™ acid-modified grade

A-series			A-5515	A-5260
Base LUCANT™			LX020	LX100
Appearance			Yellowish brown	Pale yellow
Molecular weight	Mw	GPC (PSt std.)	7,200	10,000
	Mn		3,900	5,400
	Mw/Mn		1.8	1.9
Viscosity	25℃	mPa･s	53,000	61,000
	150℃	mPa･s	70	160
Density	15℃	kg/m³	878	860
Glass transition temperature		℃	-65	-64
Acid number		mg-KOH/g	60	25

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Thermal stability (180°C*24 hours, comparison with PAO)

Heat aging test (180°C*24 hours)

After test	PAO-40*1	LUCANT™ LX004
Appearance		
Gardner number*2	5	**1**

*1 PAO-40: Kinematic viscosity(100°C)=40 mm^2/s
*2 The smaller Gardner number is, the paler the oil color is.

LUCANT™ shows the better thermal stability than PAO.

Thermal stability (150°C*72 hours, comparison with mineral oil)

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Heat aging test (150°C*72 hours)

After test	Mineral oil 1*1	Mineral oil 2*1	LUCANT™ LX004
Appearance			
Yellow Index*2	55	48	**8**
Gardner Number*2	6	5	**1**

*1 Mineral oil 1: Kinematic viscosity(40°C)=90 mm^2/s, Mineral oil 2: Kinematic viscosity(40°C)=390 mm^2/s
*2 The smaller Yellow index and Gardner number are, the paler the oil color is.

LUCANT™ shows the better thermal stability than mineral oils.

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Solubility

LUCANT™ is soluble in hydrocarbon-type solvent. Some grades of LUCANT™ are soluble in *n*-butyl acetate.

		Normal grade					Acid-modified grade	
		LX004	LX020	LX100	LX400	LX900Z	A-5515	A-5260
Aliphatic hydrocarbons	Hexane	✓	✓	✓	✓	✓	✓	✓
	Methylcyclohexane	✓	✓	✓	✓	✓	✓	✓
Aromatic hydrocarbons	Toluene	✓	✓	✓	✓	✓	✓	✓
Esters	Ethyl acetate	-	-	-	-	-	-	-
	n-Butyl acetate	✓	✓	-	-	-	✓	-
Ketones	Acetone	-	-	-	-	-	-	-
	2-butanone (Methyl ethyl ketone)	-	-	-	-	-	-	-
Alcohols	Methanol	-	-	-	-	-	-	-
	2-Propanol (Isopropyl alcohol)	-	-	-	-	-	-	-
water		-	-	-	-	-	-	-

✓=Soluble, -: Insoluble (Phase separation and/or cloudy)
Conditions: Solvent/LUCANT™ = 80/20 wt%, room temp., appearance in 24 hours after mixing

: photos shown in the next page

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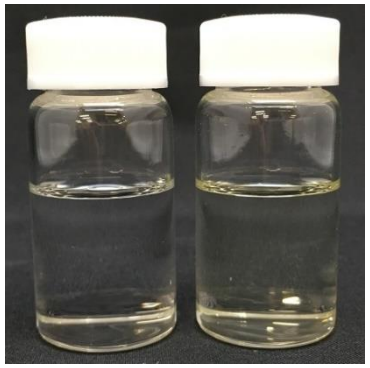
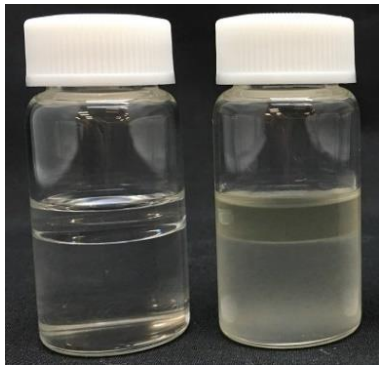
Solubility (Appearance in 24 hours after mixing)

Methylcyclohexane



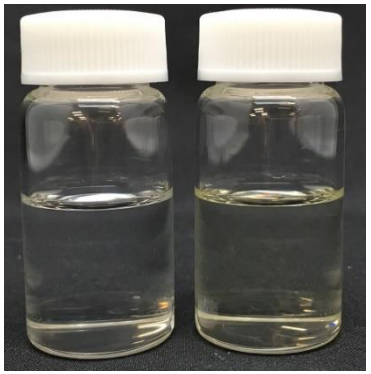
LX004 (soluble) A-5515 (soluble)

Ethyl acetate



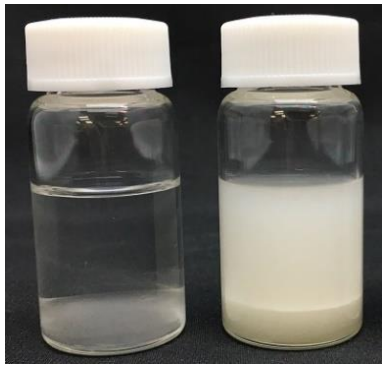
LX004 (P.S.) A-5515 (P.S.) (cloudy)

n-Butyl acetate



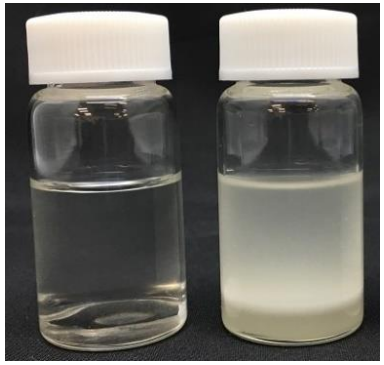
LX004 (soluble) A-5515 (soluble)

Acetone



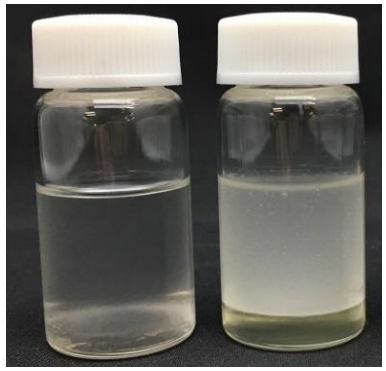
LX004 (P.S.) A-5515 (P.S.) (cloudy)

2-Butanone



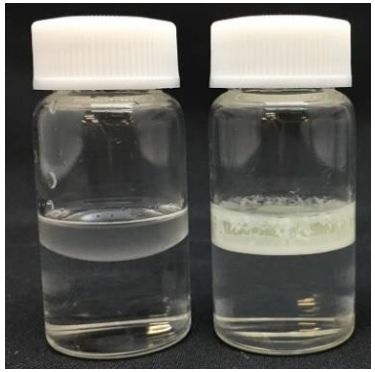
LX004 (P.S.) A-5515 (P.S.) (cloudy)

2-Propanol



LX004 (P.S.) A-5515 (P.S.) (cloudy)

Water



LX004 (P.S.) A-5515 (P.S.) (cloudy)

Conditions: Solvent/LUCANT™ = 80/20 wt%, room temp., P.S. = phase separation

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