

Eco-friendly Plasticizer, ESOL N Fluids

Non-Phthalate Plasticizer for PVC

Naphthenic Fluid

Product Name	ESOL N
Product Category	Naphthenic Hydrocarbon Resin
Chemical Structure	Hydrogenated Hydrocarbons Polymer
CAS Registry No.	69430-35-9

- **ESOL N consists of an environment-friendly superior primary non-Phthalate Plasticizer.**
- **Better compatibility for polar polymers and other polar compounds**
- **Good chemical resistance performance**
- **Improve handling characteristics, making pumping, pouring and self-leveling**



EIL Industrial Co., Ltd.

Features & Applications

Features

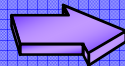
“ESOL N” is an Environment-Friendly plasticizer.

Non-Phthalate: SGS Test Result attached

ESOL “N” offers good compatibility compared to the conventional hydrocarbon plasticizer for polar polymers.

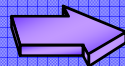
Applications

Urethane Paint



Substitution of Phthalate Plasticizers (DOP, etc.)

Epoxy Paint



Substitution of Phthalate Plasticizers (DOP, etc.)

PVC



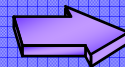
Partial Substitution of Plasticizers [DOP/DINP,etc.]

Polar Rubber



NBR : Substitution of Phthalate Plasticizer (DOP)

Others



New applications are being actively developed.



Application Properties(DECO Sheet)

ITEM	PROPERTIES		DOP 100%	DOP(70%)+ESOL N100(30%)	
SHEET	Tensile Strength(kg/cm ²)		319	332	
	Elongation(%)		220	218	
	Bending Modulus(kg/cm ²)		3,650	3,850	
	Heat Deflection Temp.(HDT,°C)		32	33	
	Softening Degree(VICAT,°C)		71	71	
	Hardness(Shore D)		73	74	
Film	Tickness(μm)		59~64	60~65	
	Impact Strength(Dart,g)		43	42	
	Tensile Strength(kg/cm ²)	MD		333	327
		TD		269	264
	Elongation(%)	MD		201	200
		TD		228	223
UV Stability (UV-CON 48hr)	Tensile Strength(kg/cm ²)	Before	333	327	
		After	306	309	
	Elongation(%)	Before	201	200	
		After	0	0	
	Color(Yellowness)	Before	-20	-19	
		After	9	12	
Heat Stability (90°C)	Termal Stress(MD, 10cm)	6hr	9.3	9.3	
		24hr	9.2	9.1	
	Migration	6hr	no	no	
		24hr	no	no	



Notice for "ESOL N" in case of PVC

- **Please don't use "ESOL N" alone.**

After you check the test report to the around 30% replacement of your present plasticizer, you can increase the dosage based on the evaluation of them.

- **Please use after blending it with "ESOL N".**

Considering the present plasticizer you use, select the grade of "ESOL N" first, and then control the input quantity of "ESOL N".

- **In case a matter of migration happens, please decrease the dosage of "ESOL N".**



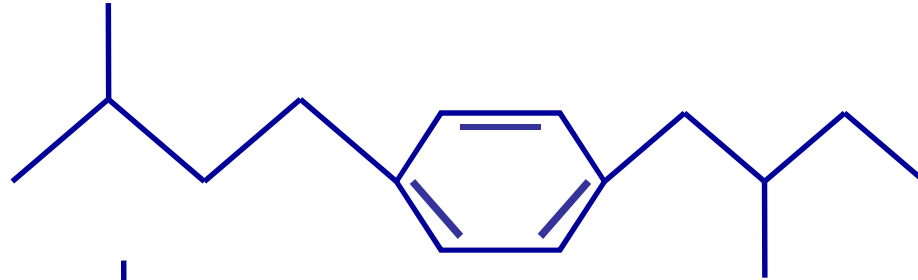
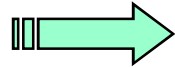
Typical Value

Grade	IBP	Flash Point	S.G	Viscosity	Aniline Point	Color
Unit	°C	COC, °C	(15°C/4°C)	cSt (@40°C)	°C	APHA
Method	ASTM D86	ASTM D92	ASTM 4052	ASTM D445	ASTM D611	ASTM D1209
N50	280	160	1.030	50	46	30
N100	280	180	1.035	100	47	60
N200	280	185	1.045	167	50	80

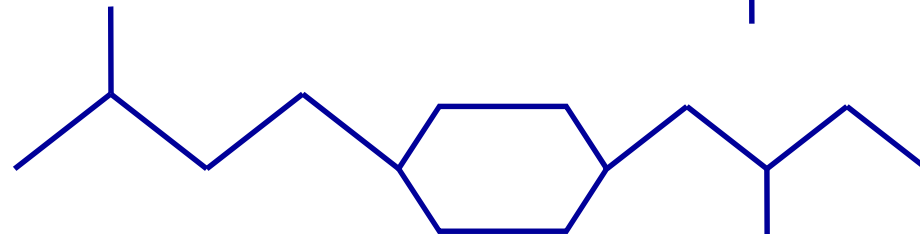
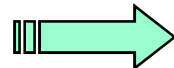


Naphthenic Structure

Aliphatic

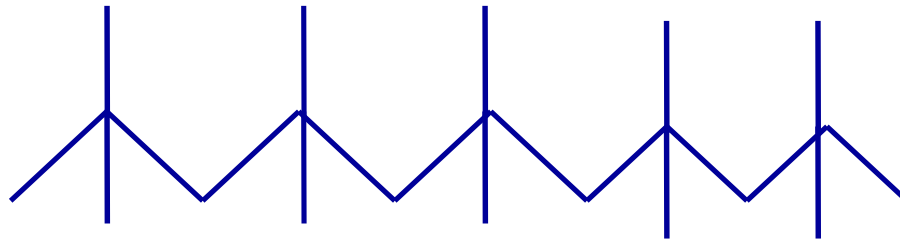
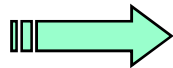


Dearomatized
Aliphatic

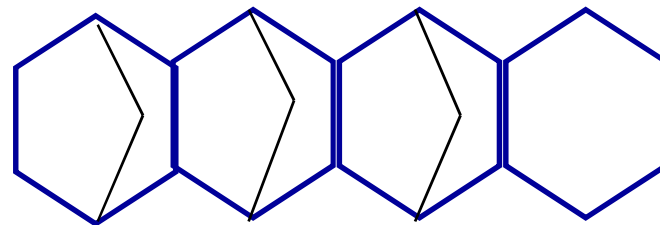
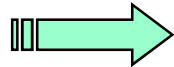


Cyclic

i-Paraffin



Naphthenic



Cyclic



EIL Industrial Co., Ltd.

Certification for Phthalate-Free

- We have got the certification for Phthalate-Free from international certificate authority, SGS.



Test Report No. F690501/LF-CTSAYAA08-07190

Issued Date: March 25, 2008

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Sample No. : AYAA08-07190.001

Sample Description : ESOL N

Style/Item No. : N/A

Phthalates

Test Items	Unit	Test Method	MDL	Results
Dimethyl Phthalate (DMP)	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Diethyl Phthalate (DEP)	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Dibutyl Phthalate (DBP)	mg/kg	ASTM D3421-75 , GC-MS	30	N.D.
Butylbenzyl Phthalate (BBP)	mg/kg	ASTM D3421-75 , GC-MS	30	N.D.
Bis-(2-ethylhexyl) Phthalate (DEHP)	mg/kg	ASTM D3421-75 , GC-MS	30	N.D.
Diisononyl Phthalate (DINP)	mg/kg	ASTM D3421-75 , GC-MS	100	N.D.
Di-n-octyl Phthalate (DNOP)	mg/kg	ASTM D3421-75 , GC-MS	30	N.D.
Diisodecyl Phthalate (DIDP)	mg/kg	ASTM D3421-75 , GC-MS	100	N.D.
Diiso butyl Phthalate (DIBP)	mg/kg	ASTM D3421-75 , GC-MS	100	N.D.
Dinonyl Phthalate (DNP)	mg/kg	ASTM D3421-75 , GC-MS	100	N.D.
Diisooctyl Phthalate (DIOP)	mg/kg	ASTM D3421-75 , GC-MS	100	N.D.
Dibenzyl Phthalate	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Dipropyl Phthalate (DPrP)	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Dicyclohexyl Phthalate (DCHP)	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Dipentyl Phthalate (DPP)	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Di phenyl Phthalate	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Di-n-Hexyl Phthalate (DHP)	mg/kg	ASTM D3421-75 , GC-MS	50	N.D.
Diiso nonyl adipate (DINA)	mg/kg	ASTM D3421-75 , GC-MS	200	N.D.
Di-ethylhexyl adipate (DEHA)	mg/kg	ASTM D3421-75 , GC-MS	200	N.D.

NOTE: (1) N.D. = Not detected.(<MDL)
 (2) mg/kg = ppm
 (3) MDL = Method Detection Limit
 (4) - = No regulation
 (5) ** = Qualitative analysis (No Unit)
 (6) Negative = Undetectable / Positive = Detectable



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