



TBF Environmental Technology

Leaders in VOC -compliant solvents - Solvents Overview

TBF Environmental Technology Inc. is a leader in the development and production of VOC-compliant alternatives to conventional solvents. All TBF products are comprised of environmentally-friendly ingredients that do not contain any Hazardous Air Pollutants (HAPs) or any ozone-depleting or -creating chemicals, and emit zero or ultra-low levels of VOCs. TBF products are effective in a broad range of applications and reduce the impact on the environment and on the health and safety of workers and end users.

ShiraSol™

VOC-compliant alternative to mineral spirits and slow evaporating solvents

- ShiraSol is certified as a Clean Air Solvent by SCAQMD.
- ShiraSol is considered a zero VOC alternative to Mineral Spirits and slow evaporating solvents.
- ShiraSol is designed for use as a primary or co-solvent and cleaner.
- ShiraSol offers a similar evaporation rate, better solvency and a higher flash point than Mineral Spirits.
- ShiraSol works effectively across aliphatic, aromatic and ketone systems.

BerdeSol™

VOC-compliant alternative to Heptane

- BerdeSol is certified as a Clean Air Solvent by SCAQMD.
- BerdeSol is considered a zero VOC alternative to Heptane for use as a cleaner, primary or co-solvent.
- BerdeSol has similar evaporation rate, and better solvency and higher flash point.

EkaSol 1™

VOC-compliant alternative to Methyl Ethyl Ketone (MEK) and Acetone

- EkaSol 1 is an effective alternative to MEK and is used as a primary or co-solvent.
- EkaSol 1 has a similar evaporation rate and higher flash point than MEK.
- EkaSol 1 is an effective alternative to Acetone for use as paint gun and line cleaner.

ZemaSol™

VOC-compliant alternative to PCBTF, TBAC and Xylene

- ZemaSol has been certified as a Clean Air Solvent by SCAQMD.
- ZemaSol offers similar solvency to Xylene and superior solvency and lower odour to PCBTF and TBAC.
- ZemaSol works effectively across a wide variety of resin systems including alkyd, phenolic, epoxy, urethane and acrylic systems

KradaSol™

VOC-compliant alternative to Hexane

- KradaSol is certified as Clean Air Solvent by SCAQMD.
- KradaSol is designed specifically for dissolution of block polymers, chlorinated rubbers and acrylics.
- KradaSol offers better solvency, higher flash point and lower odour than Hexane.

TergoSol™

VOC-compliant alternative to Acetone

- TergoSol is designed for precision cleaning as an alternative to Acetone.
- TergoSol meets Boeing Specification 5750 for aerospace cleaning.
- TergoSol may be used as primary or co-solvent in limited paints, coatings, inks and adhesives.



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TBF Solvency Comparisons

Property	Unit	ShiraSol	BerdeSol	Ekasol 1	ZemaSol	KradaSol	Tergosol	Acetone	Aromatic 100	BuAc	Cyclohexane	DMC	Heptane	Hexane	MAK	MEK	Mineral Spirits	PCBTF	PERC	TBAC	Toluene	Xylene
Initial BP	°C	147.5	59	64.2	70	88	62	55	156	125	80.7	90	98.4	68	150	79.6	148	139	121	98	111	135
Vapour Pressure	torr @ 20°C	3.5	80.6	133	147.8	36.8	140.3	185	6	10	95	42	40	10	2.14	70.2	2.5	5.6	14.1	34	22	6.6
Evaporation rate	n-BuAc = 1	0.1	2.5	3.6	5.1	1.4	5.4	6.4	0.29	1	5.5	3.2	3	8.3	0.4	3.8	0.13	0.9	2.1	2.8	1.6	0.7
Viscosity	cP	1.18	0.58	0.86	0.44	0.69	0.89	0.36	0.9	0.74	1	0.63	0.376	0.31	0.81	0.43	1	0.79	0.89	1.2	0.55	0.81
Specific Gravity	@ 20°C	1.19	0.94	0.97	1	1.07	0.97	0.79	0.88	0.88	0.78	1.07	0.68	0.66	0.82	0.8	0.79	1.34	1.62	0.86	0.87	0.87
Flash Point	°C	43.5	5.4	5	4	20.7	4.5	-20	42.2	27.2	-20	17	-4	-26	39	-8.89	38	43	-	4.44	6.7	28.3
KB value		54.5	51.3	79.1	90.3	49.2	54.7	-	93	-	54.3	-	29	30	-	-	33	64	90	-	105	98
MIR		0.097	0.047	0.47	0.079	0.062	0.065	0.43	7.51	0.89	1.46	0.06	1.28	1.45	2.8	1.49	0.9-2.47	0.11	0.04	0.2	3.97	7.49
VOC	g/L @ 20°C	2.9*	0.9*	2.66*	1.59*	2.2*	2.82*	0	880	880	780	0**	680	660	820	800	880	0	1620	0**	870	870
Global Warming Potential (GWP)		5.4	9	0	0	8	0															
Surface Tension	dynes/cm	24.5	20.4	26.1	24.2	21.1	25.1	22.3	29	25.1	25	28.5	20.1	18.4	26.1	24.6	24.7	25	32.3	22.4	28.4	28.7
Heat of Combustion	Btu/lb	8046,8	10898	9205	8944	9905	8584	13218.9	NA	13130	18684	6820.5	19170	19246	12898.2	13480	NA	7700	1763.3	NA	17430	18435.4
	kca/kg	4473.2	6058	5117	4971.3	5506	4771.3	7348.4	NA	7298.9	10386.4	3791.5	10656.6	10699	7170.1	7493.5	NA	4280.4	980.2	NA	9689.3	
δ (Hansen Solubility Parameters)	(MPa) ^{1/2}	17.2	14.9	19	18.5	17.9	18.7	19.9	17.8	17.4	16.8	18.7	15.3	14.9	17.6	19.1	15.8	17.5	19.3	17.7	18.2	17.9
δH (Hydrogen-Bond)	(MPa) ^{1/2}	3.4	3.6	8.5	7.2	3.1	8.1	7	0	6.4	0.2	9.7	0	0	4.1	5.1	0.2	4.7	0	6.2	2	3.1
δP (Polar)	(MPa) ^{1/2}	8.3	4.5	6.4	7.6	5.7	6.3	10.4	1	3.69	0	3.9	0	0	5.74	9	0.1	9.9	5.7	6.2	1.4	1
δD (Dispersion)	(MPa) ^{1/2}	13.9	13.8	15.7	15.3	13.5	15.5	15.5	17.8	15.8	16.8	15.5	15.3	14.9	16.2	16	15.8	13.7	18.4	15.4	18	17.6
Hildebrand	(MPa) ^{1/2}	18.2	16.9	19.9	19.2	17.2	19.5	19.7	17.8	17.4	16.8	20.3	15.3	14.9	17.4	19.3	15.4	17.6	19.2	16.6	18.3	18.2
δ (Hansen Solubility)	(cal/cm ³)	8.4	7.3	9.3	9	7.3	9.1	9.7	8.7	8.5	8.2	9.1	7.5	7.3	8.6	9.3	7.7	8.6	9.4	8.6	8.9	8.7
δH (Hydrogen-Bond)	(cal/cm ³)	1.7	1.8	4.2	3.5	1.5	4	3.4	0	3.1	0.1	4.7	0	0	2	2.5	0.1	2.3	0	3	1	1.5
δP (Polar)	(cal/cm ³)	4.1	2.2	3.1	3.7	2.8	3.1	5.1	0.5	1.8	0	1.9	0	0	2.8	4.4	0.1	4.8	2.8	3	0.7	0.5
δD (Dispersion)	(cal/cm ³)	6.8	6.7	7.7	7.4	6.6	7.6	7.6	8.7	7.7	8.2	7.6	7.5	7.3	7.9	7.8	7.7	6.7	9	7.5	8.8	8.6
Hildebrand	(cal/cm ³)	8.9	8.2	9.7	9.4	8.4	9.5	9.8	8.7	8.5	8.2	9.9	7.4	7.2	8.5	9.3	7.5	8.6	9.4	8.1	8.9	8.9

*SCAQMD – South Coast Air Quality Management District, CARB - California Air Resources Board.

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