MEMO AVOID ORAL INSTRUCTIONS DATE 5/20 1970

TO ~~Bob Anderson~~ → CWS

Please advise what type of Arochlors are here, how much of each in 1969, and send any info on chlorine content, etc of these materials. We need this for environmental consequence.

Ar 1232 - 1960 #
" 1248 " 122,200

Thx
CWS

Form AM 686-A ✚ DO IT THE SAFE WAY ✚ SIGNED

MPM0000446

EPA005458

MEMO AVOID ORAL INSTRUCTIONS DATE _____ 19____

TO _____

Form AM 686-A

✚ DO IT THE SAFE WAY ✚

SIGNED _____

MPM0000447

EPA005459

General Physical Properties of the Aroclor® Chlorinated Compounds

	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254
Form	Colorless mobile oil	Practically colorless mobile oil	Practically colorless mobile oil	Colorless to light yellow-green, clear, mobile oil	Light yellow viscous oil
Color	50 Max. (APHA)	50 Max. (APHA)	50 Max. (APHA)	50 Max. (APHA)	50 Max. (APHA)
Acidity — Maximum (Mgm. KOH per Gm.)	0.014	0.014	0.010	0.010	0.010
Average Coefficient of Expansion ... cc/cc/°C	0.00071 (15°-40°C)	0.00073 (25°-100°C)	0.00068 (25°-65°C)	0.00070 (25°-65°C)	0.00066 (25°-65°C)
Typical Density					
Specific Gravity	1.182-1.192 (25° 15.5°C)	1.270-1.280 (25° 15.5°C)	1.381-1.392 (25°, 15.5°C)	1.405-1.415 (65° 15.5°C)	1.495-1.505 (65° 15.5°C)
Pounds per gallon — 25°C (77°F)	9.85	10.55	11.50	12.04	12.82
Distillation Range — ASTM D-20 (Mod.) Corr. °C	275°-320°	290°-325°	325°-366°	340°-375°	365°-390°
Evaporation Loss % — ASTM D-6 Mod.					
163°C ... 5 hrs.		--	3.0 to 3.6	3.0 to 4.0	1.1 to 1.3
100°C ... 6 hrs.	1.0 to 1.5	1.0 to 1.5	0.0 to 0.4	0.0 to 0.3	0.0 to 0.2
Flash Point — Cleveland Open Cup °C	141°-150°	152°-154°	176°-180°	193°-196°	None
°F	286°-302°	305°-310°	348°-356°	379°-384°	
Fire Point — Cleveland Open Cup °C	176°	238°	None*	None	None
°F	349°	460°			
Pour Point — ASTM D-97 °C	Crystals at 1°C	−35.5°	−19°	−7°	10°
°F	Crystals at 34°F	−32°	2°	19.4°	50°
Softening Point — ASTM E-28 °C	—	-	—	—	—
°F	-	—	—	—	—
Refractive Index — D-line — 20°C	1.617-1.618	1.620-1.622	1.627-1.629	1.630-1.631	1.639-1.641
Viscosity — Saybolt Universal (98.9°C) Sec. (ASTM — D-88)	30-31	31-32	34-35	36-37	44-48
[illegible]	35-37	39-41	49-56	73-80	260-340
100°F (37.8°C)	38-41	44-51	82-92	185-240	1800-2500

*NONE indicates "No fire point up to boiling temperature"

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Dermatology and Toxicology

At ordinary temperatures the Aroclor polychlorinated polyphenyls have not presented industrial toxicological problems. The hazard of potential toxic exposure varies with their volatility: the lower-chlorinated ones, being more volatile, present more of a potential problem from the standpoint of both inhalation and skin contact. When Aroclor is used at elevated temperatures, engineering controls must be applied, either by the use of closed systems or by effective local-exhaust ventilation together with general workroom exhaust.

Inhalation tests on animals indicate that the maximum safe concentration of vapor is in the range of 0.5 to 1.0 milligram of the lower-chlorinated Aroclor compounds per cubic meter of air. The threshold limits (maximum allowable concentration for an 8-hour working day) set by the American Conference of Government Hygienists are 1.0 milligram of the lower-chlorinated Aroclor compounds per cubic meter of air and 0.5 milligram of the more-highly-chlorinated compounds, such as Aroclor 1254, per cubic meter of air.

Schwartz patch tests on 200 volunteers showed that neither Aroclor 1254 alone when applied to gauze nor a polyvinyl chloride film containing 11.5-weight-per cent Aroclor 1254 was a primary irritant or a sensitizer. Canvas coated with an oil-modified alkyd resin (17-weight-per cent of the paint-film solids and 7-weight-per cent of the painted fabric was Aroclor 5460) did not produce primary skin irritancy or sensitization according to the same Schwartz technique. Continuous or repeated skin contact with Aroclor must be avoided because of the possible occurence of a condition called chlorance. Although reports of this condition caused by Aroclor are rare, it can be produced by excessive skin contact.

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Safe Handling

Vapors of the Aroclor liquids at room temperature should not be breathed in a confined space. Vapors evolved at elevated temperatures should not be allowed to be dispersed into the general workroom. Instead, engineering control must be applied to reduce vapor concentrations below the allowable concentrations mentioned above.

Continuous or repeated skin contact with Aroclor must be avoided by the use of gloves and protective garments. If any Aroclor is spilled on the skin, the skin should be washed in the usual manner with a soap solution.

A burn caused by contact with a hot Aroclor should be treated like any ordinary burn. Aroclor adhering to the burned area need not be removed immediately, unless treatment of the burn demands it, in which case either soap and water or repeated washings with a vegetable oil are recommended.

Shipping Information

Freight Classification	
AROCLOR 1221, 1243, 1242, 1248, 1254, 1260, 1262	Synthetic Resin, Liquid, NOIBN
Rail Classification	
AROCLOR 1268, 2565, 4465, 5442, 5460	Synthetic Resin, Other Than Liquid, NOIBN
Truck Classification	
AROCLOR 1268, 2565	Synthetic Resin, Powder, NOI
AROCLOR 4465, 5442, 5460	Synthetic Resin, Lumps or Solid Mass, NOI
Shipping Regulations	None
Standard Containers	
AROCLOR 1221	Tank car, 520-lb. steel drum, 50-lb. can
AROCLOR 1232	Tank car, 550-lb. steel drum, 50-lb. can
AROCLOR 1242, 1248, 1254, 1260, 1262	Tank car, 600-lb. steel drum, 50-lb. can
AROCLOR 1268	200-lb. fiber drum, 50-lb. can
AROCLOR 2565, 4465	500-lb. steel drum, 50-lb. can
AROCLOR 5442	450-lb. steel drum, 50-lb. can
AROCLOR 5460 (flaked)	[illegible]-lb. bag

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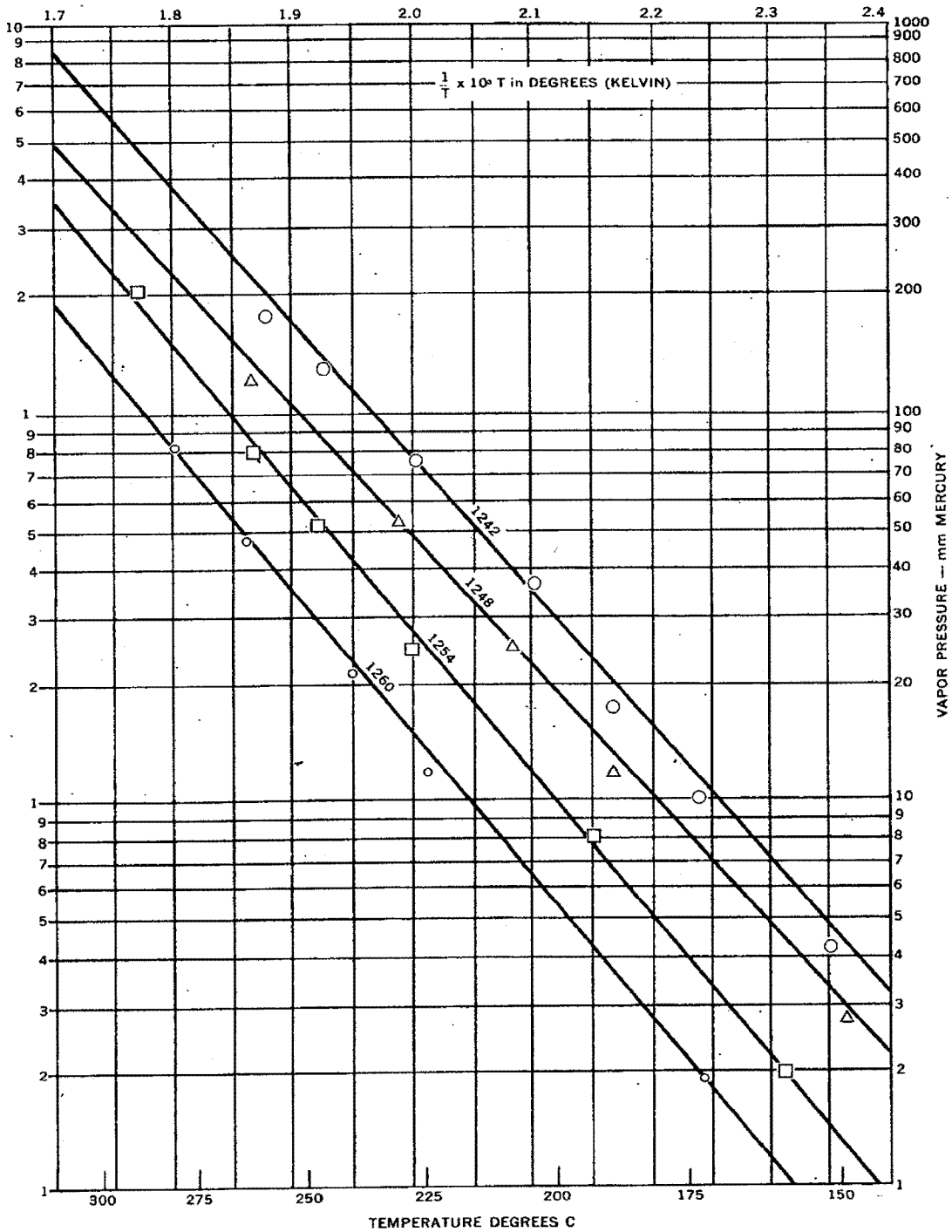
VAPOR PRESSURE OF AROCLOR® CHLORINATED COMPOUNDS



CORROSION RESISTANCE OF STRUCTURAL MATERIALS

Metals	Aroclor Number 1248 25°C	1248 125°C	1254 25°C	1254 125°C	4465 125°C	5460 125°C
Aluminum	R	R	R	R	*RR	RR
Copper	R	D	R	D	D	D
Magnesium	RR	R	R	R	RR	*RR
Nickel	RR	R	R	RR	RR	R
Silver	R	R	R	R	R	R
Tin	R	R	R	R	R	R
Zinc	R	R	R	R	R	RR
Mild Steel	RR	R	RR	RR	R	RR
Phosphor Bronze	R	D	R	R	R	R
Red Brass	D	D	R	D	R	De
Stainless Steel (Type 316)	RR	RR	RR	RR	RR	RR
Yellow Brass	R	Re	R	De	Re	Re
Plastics						
Alkyd Resin No. 46594-12	*P	P	*P	P	P	P
Alkyd Resin No. 46594-13A	*D	P	*D	P	P	P
Cellulose Acetate (Fibestos)	D	P	D	P	P	P
Durite(1) Phenol Furfural Resin	*D	P	*R	P	D	P
Formvar® Highly Plasticized polyvinyl formal resins	De	T	Pe	T	T	T
Formvar® Low Plasticized polyvinyl formal resins	PS	T	PS	T	T	T
Glyptal 1276	R	P	D	P	P	P
Glyptal 7136	*D	T	*R	T	T	T
Maleic Resin No. 46594-13B	P	P	*P	P	P	P
Maleic Resin No. 46594-13C	P	P	*R	P	P	P
Methyl Methacrylate	*D	P	*D	P	P	P
Lustron® B Polystyrene	P	T	P	T	T	T
Resinox® Mineral Filled Melamine Resin	*D	*P	*R	R	*P	*D
Resinox Wood Flour Filled Melamine Resin	*D	P	*R	D	R	P
Resinox Mineral Filled Phenol Formaldehyde	*D	D	*D	D	R	P
Resinox Wood Flour Filled Phenol Formaldehyde	*D	P	*D	*R	D	P
Resinox Rag Filled Phenol Formaldehyde	*D	D	*D	*D	*D	P
Urea Formaldehyde Resin (Plaskon Co.)	*D	P	*D	*P	P	P

Meaning of Abbreviations:
* — Based on weight gain calculated as penetration value shown.
RR — Excellent resistance — less than 1.0×10^{-6} cm/day penetration or .00014 in/yr.
R — Good resistance — has penetration between 1.0×10^{-6} and 10×10^{-6} cm/day or between 0.00014 and 0.0014 in/yr.
D — Doubtful resistance, penetration between 10×10^{-6} cm/day and 100×10^{-6} cm/day or between 0.0014 and 0.014 in/yr.
P — Poor resistance — penetration greater than 100×10^{-6} cm/day or 0.014 in/yr.
PS — Poor resistance due to visible local action although weight change indicates greater resistance.
e — Following the letter indicating resistance signifies material may be better than indicated if totally immersed since weight loss is believed to come from oxidation of the part of test strip exposed to air.
T — Material alone will not stand temperature.
(1) — Durite is a registered Trademark of Borden Chemical Co.

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VAPORIZATION RATES

Sample	Wt. Loss Gms.	Hours Exposure	Surface Area Cm.²	Vaporization Rate gms./cm.²hr./100°C
Aroclor® 1221	0.5125	24	12.28	0.00174
Aroclor 1232	0.2572	24	12.28	0.000874
Aroclor 1242	0.0995	24	12.28	0.000338
Aroclor 1248	0.0448	24	12.28	0.000152
42% chlorinated paraffin	0.0745	48	12.28	0.000126
dioctyl phthalate	0.0686	48	12.28	0.000117
Dutrex* 25	0.0256	24	12.28	0.000087
Aroclor 1254	0.0156	24	12.28	0.000053
Dutrex 20	0.0047	24	12.28	0.000016
Aroclor 1262	0.0039	24	12.28	0.000013
Aroclor 1260	0.0026	24	12.28	0.000009
Aroclor 4465	0.0064	72	12.28	0.000007
Aroclor 1270	0.0045	72	12.28	0.000005
Aroclor 5442	0.0039	72	12.28	0.000004
Aroclor 5460	0.0032	72	12.28	0.000004
Tricresyl phosphate	0.0010	24	12.28	0.000003

*Dutrex is a registered trademark of the Shell Oil Co.

APPROXIMATE VAPOR PRESSURES CALCULATED AT 100° F (37.8° C)

Aroclor® 1232	0.005 mm. Hg.
Aroclor 1242	0.001 mm. Hg.
Aroclor 1248	0.00037 mm. Hg.
Aroclor 1254	0.00006 mm. Hg.

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