MONSANTO CHEMICAL COMPANY
ANNISTON, ALABAMA

AROCLOR & PYRANOL ANALYSES

I. AROCLORS (Liquid)

Controls:

Non Electrical Grade: Received in 1 x 1/2 gal. bottle.
Labeled for: H_2O
Sp.Gr.

Electrical Grade: Received in 1 x 1/2 gal. bottle.
Labeled for: N_D25
Cl
Sp.Gr.
H_2O

	Sp.Gr.@ T°C.	Specs.	Corr.Coef./°C.	Range	H_2O Specs (ppm)	N_D25
1221	25/15.5	1.182-1.192	None	25°C.	*	-
1232	25/15.5	1.270-1.280	None	25°C.	*	-
1242	25/15.5	1.381-1.392	0.0009	20-35°C.	50,35(1) Max.	1.6245-1.6265
1248	65/15.5	1.405-1.415	0.0009	50-100°C.	50 "	-
1254	65/15.5	1.495-1.505	0.00095	55-105°C.	50,35(1) "	1.6370-1.6390
1260	90/15.5	1.555-1.566	0.001	75-130°C.	50,35(1) "	1.6455-1.6470

Notes: (1) Denotes H_2O Max. for Electrical Grade.
* Acid #: 0.014 Max. - Visc. @ 100°F.

II. AROCLORS (Liquid)

Final Sample (Stg, Car, or Drums)

Non Electrical Grade: Received in 2 x 1/2 gal. bottles.
Labeled for: Complete analysis

Material	Tests	Specs
1221	APHA	100 Max.
	Sp.Gr. @ 25/15.5°C.	1.182-1.192
	Acidity, Mg KOH/g	0.014 Max.
	Visc. @ 100°F.	38 - 41
1232	APHA	100 Max.
	Sp.Gr.@ 25/15.5°C.	1.270-1.280
	Acidity,Mg KOH/g	0.014 Max.
	Visc. @ 100°F.	44 - 51
1242	APHA	100 Max.
	Condition	Clear
	Sp.Gr.@ 25/15.5°C.	1.381 - 1.392
	Acidity,Mg KOH/g	0.010 Max.
	H_2O	50 ppm Max.
	Dist. by weight	
	10%	325°C. Min.
	90%	366°C. Max.
	Flash Point	320°F. Max.

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Material	Tests	Specs
1248	APHA	100 Max.
	Condition	Clear
	Sp.Gr. @ 65/15.5°C.	1.405 - 1.415
	Acidity	0.010 Max.
	H_2O	50 Max.
	Visc. @ 130°F.	73 - 80
1254	APHA	100 Max.
	Condition	Clear
	Sp.Gr.@ 65/15.5°C.	1.495 - 1.505
	Acidity	0.010 Max.
	H_2O	50 Max.
	Visc. @ 210°F.	44 - 48
	Flash Point	None
1260	APHA	150 Max.
	Condition	Clear
	Sp.Gr.@ 90/15.5°C.	1.555 - 1.566
Note: Flash Points on 1254 and 1260 shall be carried to 500°F.	Acidity	0.014 Max.
	H_2O	50 Max.
	Visc. @ 210°F.	72 - 78
	Flash Point	None
	Electrical Grade:	Received in 3 x 1/2 gal. bottles.
	Labeled for:	Complete analysis.

Note: A 5 pint sample of 1260 will accompany the 3 regular samples from the stg. tank, if the 1260 is to be used in a 1470 Pyranol mix.

Material	Test	Specs
1242	APHA	100 Max.
	Condition	Clear
	Sp.Gr.@ 25/15.5°C.	1.381 - 1.392
	Acidity	0.010 Max.
	H_2O	35 Max.
	N_D25	1.6245 - 1.6265
	Free Cl^-	0.10 Max.
Note: Litant Test if for G.E. Westinghouse Test if for Westinghouse.	Pour Point	-14 or lower
	P.F.@1000 cycles, 100°C.	Report
	D.C.@ 1000 cycles, 100°C.	4.70 - 4.90
	Resistivity @ 100°C.	500 x 10^9 ohm-cm
	Monsanto Stability	0.40 Max.
	Corrosion	None
	Condition	Clear
	APHA	150 Max.
	Acidity	0.010 Max.
	Ac Cl	0.10 Max.
	Flash Point	320°F.
	Dist. by weight	
	10%	325°C. Min.
	90%	366°C. Max.

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Material	Tests	Specs
1254	APHA	100 Max.
	Condition	Clear
	Sp.Gr.@ 65/15.5°C.	1.495 - 1.505
Note: Resistivity @ 100°C. for Cornell Dubilier must be 1500 x 10^9 or above.	Acidity	0.010 Max.
	H_2O	35 Max.
	N_D25	1.6370 - 1.6390
	Free Cl^-	0.10 Max.
	Pour Point	7 - 12°C.
	P.F.@1000 cycles, 100°C.	Report
	D.C.@1000 cycles, 100°C.	4.15 - 4.35
	Resistivity @ 100°C.	500 x 10^9 ohm-cm, Min.
	Corrosion	None
	Condition	Clear
	APHA	150 Max.
	Acidity	0.010 Max.
	Ac Cl	0.10 Max.
	Flash Point	None to B.P.
	Dist. by weight	
	10%	366 - 378°C.
	50%	372 - 383
	90%	383 - 396
	Monsanto Stability	0.5 Max.

Material	Tests	Specs
1260	APHA	150 Max.
	Condition	Clear
	Sp.Gr.@ 90/15.5°C.	1.555 - 1.566
	Acidity	0.014 Max.
	H_2O	35 Max.
	Visc. @ 210°F.	72 - 78
	N_D25	1.6455 - 1.6470
	Free Cl	0.10 Max.
	Pour Point	25 - 34°C.
	Dist. by weight	
	10%	385 - 398°C.
	50%	390 - 404
	90%	400 - 420
	Corrosion	None
	Condition	Clear
	APHA	150 Max.
	Acidity	0.014 Max.
	Ac Cl	0.10 Max.
	Flash Point	None
	Monsanto Stability	0.7 Max.

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Notes:

1. 1254 or 1260 stg's which are to be used in Pyranol mixes will have the Lot No. of the Pyranol for which it will be used noted on the label. Include this information on analytical ticket.

2. All Aroclor controls will be reported in duplicate with distribution to Klemme and Department Supervisor (Clegorn).

3. Finals will be reported in triplicate and distributed to Klemme, Department Supervisor (Clegorn), and shipping (Gray) for Cars or Drums. Omit shipping on stg samples.

4. Arrow any value out of specifications on final samples.

5. Aroclor drums receive priority. Check following properties and report to department as soon as possible. Then complete the analysis:

   Condition
   H_2O
   Cl
   N_D25
   Sp.Gr.
   P.F. @ 100°C.
   D.C. @ 100°C.
   Resist. @ 100°C.
   * Visc.

   *For 1260 only. Omit electrical properties for 1260.

6. Reserve one full brown 1/2 gal. bottle of each lot. Also, reserve and hold any 5 pint bottles for advance samples.

III. PYRANOLS

Raw Materials

Glycidyl Phenyl Ether (PPO) - See Note B of Pyranol Controls.
Tin Tetraphenyl (Tin Ted) - See Note A of Pyranol Controls
TCB - Received in 2 x 1/2 gal. bottles labeled for: Complete Analysis.

TCB	Tests	Specs
	APHA	15 Max.
Note: Sp.Gr. Coef./°C. is 0.0011	Condition	Clear
	Sp.Gr.@15.5/15.5°C.	1.460 - 1.477
	Acidity	0.014 Max.
	H_2O	75 Max.
	N_D25	1.5680 - 1.5715
	Free Cl	0.10 Max.
	1st Crystals	Report
	x Pt	10°C. Max.
	Dist.(by vol.)	
	1st Drop	205°C. Min.
	5%	210, Min.
	50%	213, Min.
	90%	215, min.

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TCB (Continued)

Tests	Specs
Corrosion	None
Condition	Clear
APHA	200 Max.
Acidity	0.014 Max.
Ac Cl	0.10 Max.
Monsanto Stability	Report

TTCB - Received in 2 x 1/2 gal. bottles and 1 - 5 pint bottle. Labeled for: Complete Analysis.

Tests	Specs
APHA	15 Max.
Condition	Clear
Sp.Gr. @ 15.5/15.5°C.	1.510 - 1.522
Acidity	0.014 Max.
H_2O	75 Max.
N_D25	1.5775 - 1.5790
Free Cl	0.10 Max.
x Pt	-15°C. or lower
Last Crystals	0°C. Max.
Dist. by vol.	
1st drop	210°C. Min.
5%	215, Min.
65%	228, Min.
90%	255, Max.
95%	265, Max.
Dry Pt.	278, Max.
Corrosion	None
Condition	Clear
APHA	100 Max.
Acidity	0.014 Max.
Ac Cl	0.10 Max.
Monsanto Stability	Report

Note: Sp.Gr. Coef./°C. is 0.0011

IV. PYRANOLS

Controls - Received in 1 x 1/2 gal. bottle - Labeled for:

	H_2O	Cl	N_D25	Sp.Gr.@ 15.5°C.
1467	*30 Max.	0.10 Max.	1.6137-1.6157	1.560-1.568
1470	*30 Max.	0.10 Max.	1.6075-1.6085	1.563-1.571
1481	35 Max.	0.10 Max.	1.6205-1.6215	1.525-1.535
1488	30 Max.	0.10 Max.	1.6137-1.6157	1.560-1.568

Note: Sp.Gr. Coef./°C. for all Pyranols is 0.0011

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A. If Tin Tet is to be added to any of the Pyranols (1467 or 1470), an 8 oz. bottle of the Tin Tet will accompany the Pyranol sample. The lab will make a pilot batch to check both the Tin Tet and Pyranol for Cl and corrosion condition. The corrosion condition shall not be checked until the H_2O is *20 ppm (see page 5) or below. The Tin Tet shall not be added to mix by the department until approval by lab.

Corr. Cond.-Weigh .39 gms. Tin Tet to 300 gms. Pyranol Mix
Specs. - Clear
Empirical Factor and Cl-Weigh .65 gms Tin Tet to 500 gms Pyranol Mix. Put into solution, run Cl, wrap mix in foil and hold for % Tin Tet analysis on final sample.

B. If P.P.O. is to be added to any of the Pyranols, a 16 oz. sample of the P.P.O. will accompany the Pyranol sample. If it is the first time the P.P.O. drum has been sampled, it will receive a Cl analysis and a Sp.Gr. @ 20/20°C. for identification. If it has been sampled previously, it will get only chlorides.

Cl - Make a .2% solution of P.P.O. in Pyranol mix to check P.P.O. and mix for Cl in one operation.
Sp.Gr. @ 20/20°C. = Sp.Gr. @ 20/15.5°C. x 1.001 Specs.:Cl - 0.1 Max.
Sp.Gr. @ 20/20-1.105-1.115

When preceding material is approved, the department will mix and send stg sample with appropriate Lot No. to lab for complete analysis. The material will not be loaded until lab approves it.

V. PYRANOLS

Final Sample (Stg) - Received in 3 x 1/2 gal. bottles. Labeled for: Complete Analysis

1467 - 1488 - Inerteen PPO

60% 1260 Aroclor
40% TCB

Tests	Specs
APHA	150 Max.
Condition	Clear
Sp.Gr.@15.5/15.5°C.	1.560-1.568
Acidity	0.014 Max.
H_2O	30 Max.
Free Cl	0.10 Max.
D.S.@ 25°C.	35 KV Min.
P.F.@1000cycles, 100°C.	Report
D.C.@1000cycles, 100°C.	3.70-4.00
Resis.@ 100°C.	100 x 10^9 ohm-cm Min.
Visc. @ 100°F.	52 - 56 SUS
Pour Point	-32°C. Max.
Dist. by weight	
1st drop	200°C. Min.
Below 270°C.	40% Max.
90%	395 - 415°C.

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(1467-1488-Inerteen PPO contd.) Tests	Specs
Corrosion	None
Condition	Clear
APHA	200 Max.
Acidity	0.014 Max.
Ac Cl	0~~.10~~ Max. 2.0 PPM
Fire Point	None
Tin Tet	0.115-0.135%
or	
P.P.O.	0.18 -0.22 %

Material	Tests	Specs
1470	APHA	150 Max.
45% 1260 Aroclor	Condition	Clear
55% TTCB	Sp.Gr.@15.5/15.5°C.	1.563-1.571
plus Tin Tetraphenyl	Acidity	0.014 Max.
	H_2O	30 Max.
	N_D25	1.6075-1.6085
	Free Cl	0.10 Max.
	D.S.@25°C.	35 KV Min.
	~~P.F.@1000 cycles, 100°C.~~	~~Report~~
	~~D.F.@1000 cycles, 100°C.~~	~~1.00-4.20~~
	Resist.@ 100°C.	100 x 10^9 Min.
	Visc. @ 100°F.	41 - 45
	Pour Point	-44°C. Max.
	Fire Point	None
	Tin Tet	0.115 - 0.135%
	Dist. by volume	
	1st drop	210°C. Min.
	35%	240-256
	55%	290-330
	65%	385-400
	90%	395-415
	Corrosion	None
	Condition	Clear
	APHA	200 Max.
	Acidity	0.014 Max.
	Ac Cl	~~0.10~~ Max. 5.0

Material	Tests	Specs
1481		
75% 1254 Aroclor	APHA	150 Max.
25% TCB	Condition	Clear
	Sp.Gr.@15.5/15.5°C.	1.525-1.535
	Acidity	0.010 Max.
	H_2O	35 Max.
	N_D25	1.6205-1.6215
	Free Cl	0.10 Max.

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1481 continued	Tests	Specs
	P.F.@ 1000 cycles, 100°C.	Report
	D.C.@ 1000 cycles, 100°C.	4.10-4.60
	Resist. @ 100°C.	100 x 10^9 Min.
	Visc. @ 100°F.	70 - 82
	Pour Point	-15°C. or lower
	Corrosion	None
	Condition	Clear
	APHA	200 Max.
	Acidity	0.010 Max.
	Ac Cl	0.10 Max.
	Fire Point	None
	Distillation	
	1st drop	205°C. Min.
	Below 270°C.	25% Max.
	90%	380 - 395
	Monsanto Stability	0.5 Max.

Final Car or Drum Sample - Received in 2 x 1/2 gal. bottles and 1 5-pint bottle.
Labeled for: Car Analysis or Drum Analysis

1467, 1470, 1481, 1488 and Inerteen PPO	Condition H_2O Cl N_D25 ~~P.F. @ 100°C.~~ ~~D.C. @ 100°C.~~ Resist. @ 100°C. Rest of analysis same as stg sample, Lot No._____.	Note: Specs same as for Stg Analysis

Note: Drums receive priority. Check above properties and report to department as soon as possible.

PYRANOL NOTES:

1. Raw Materials: TCB and TTCB will have the Lot No. of the Pyranol for which it will be used noted on label. Include this information on analytical ticket. Report in triplicate and distribute to Klemme and department supervisor (Clegorn). P.P.O. and Tin Tet will not have Lot No. included on label. Include this information on label and analytical ticket. Report and distribute same as for TCB and TTCB. Reserve one full brown 1/2 gal. bottle of TCB or TTCB and reserve and hold any 5 pint bottles for advance samples. Reserve one bottle of Tin Tet or PPO for each mix made.

2. Finals: Note on analytical ticket the Lot No. of 1254 or 1260, Car No. and date of TCB or TTCB, and Drum No. of Tin Tet or PPO, which were used in mix.

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3. Reserve one full brown 1/2 gal. bottle of material representing stg, car, or drums. Reserve and hold any 5 pint bottles for advance samples.

4. Pyranol controls will be reported in duplicate and distributed to Klemme and department supervisor (Clegorn).

5. Finals will be reported in triplicate and distributed to Klemme, department supervisor (Clegorn), and shipping (Gray) for cars and drums. Omit shipping on stg samples.

6. Arrow any value out of specifications on final samples.

Larry Sims

LS/fb
7/15/58

STLCOPCB4089436