

DATA SHEET

Table No. I shows the results obtained in testing varnish samples containing Aroclor. In each case the oil and resin were cooked together until a proper body was obtained; heating was then stopped, the Aroclor added and stirred in, and as soon as the temperature had dropped sufficiently petroleum spirits was added as a thinner.

The resins used were (1) rosin, (2) ester gum (3) Amberol F-7, a modified phenolic resin made by Resinous Products and Chemical Company, (4) Resin ST-137, a pure phenolic resin by Resinous Products, (5) Resin BR-254, a pure phenolic made by Bakelite Corporation, and (6) Durez 550, a pure phenolic made by General Plastics, Incorporated.

Color of the varnishes was rated by the Gardner 1933 Color Standard.

The Kauri Reduction is a standard method for evaluating the flexibility of varnishes. It must be considered in relation to the kind of oil and resin used and is supposed to give an indication as to the weathering properties of the varnish--that is, increased percentage of Kauri Reduction indicates increased flexibility and better weathering properties.

Polymerized Oiticica Oil was used in some of the resins and in the tables it is referred to as "poly Oiti-" oil. Amounts of oil, as well as resin and Aroclor, are expressed by weight. Since the oils weigh approximately eight pounds per gallon, one hundred of oil to one hundred of resin represents a twelve and a half (12.5) gallon varnish; two hundred of oil to one hundred of resin, a twenty-five (25) gallon varnish, et cetera.

In each varnish 0.5% lead and 0.05% cobalt in the form of naphthenates was added as a drier.

DSW 550917

TABLE I

A STUDY OF CHLORINATED DIPHENYL IN A FEW VARNISH FORMULAS AS A REPLACER OF TUNG OIL

VARNISH	NON-VOLATILE	BODY	COLOR	DRYING TIME	KAURI REDUCTION	HOT WATER (1 hr.)	COLD WATER (72 hrs.)	5% NaOH SOLUTION
No. 1								
200 Tung Oil	Not run	C	12	Set 30 min. Hard 4 hours.	Not tested	Badly whitened. Recovers in 1 hr.	Sl. Whitened. Recovers in 20 min.	Whitened and softened 1 min.
100 Rosin								
100 Aroclor 1262								
No. 2								
200 Tung Oil	50	L	15	Set 2 hrs. Hard over night	Pass 80%	Sl. whitened. Recovers in 20 min.	Very sl. whitened. Recovers in 20 min.	Sl. whitened. 2 hrs. Fair 20 hrs.
100 Ester Gum								
100 Aroclor 1262								
No. 3								
200 Tung Oil	50	H	14	Set 30 min. Hard 3 hrs.	Fail 80%	Very sl. whitened. Recovers in 20 min.	Very sl. whitened. Recovers in 20 min.	Whitened and soft 20 hrs.
100 Reduced Phenolic Resin F7								
100 Aroclor 1262								
No. 4								
200 Tung Oil	50	C	15	Set 2 hrs. Hard Over night	Pass 100%	Very sl. whitened. Recovers in 20 min.	Very sl. whitened. Recovers in 10 min.	Hard and clear 20 hrs.
100 Pure Phenolic Resin ST 137								
100 Aroclor 1262								
No. 5								
100 Tung Oil	53	J	Over 18	Set 45 min.	Fails 50%	Badly whitened. Recovers in 1 hr.	Moderately whitened. Recovers in 20 min.	-----
100 Reduced Phenolic Resin F7								
100 Aroclor 1262								
No. 6								
200 Poly Oit1 Oil	54	E	15	Set 2 hrs. Hard 7 hrs.	Pass 80% Fail 100%	Unaffected.	Very sl. whitened. Recovers in 10 min.	Sl. whitened 15 min.
100 Aroclor 1262								
100 Pure Phenolic Resin BR 254								

TABLE I (continued)

VARNISH	NON-VOLATILE	BODY	COLOR	DRYING TIME	KAURI RE-DUCTION	HOT WATER (1 hr.)	COLD WATER (72 hrs.)	5% NaOH SOLUTION
No. 7								
200 Poly 01t1 Oil	46	G	14	Set 2 hrs.	Falls 80%	Unaffected	Very sl. whitened. Recovers in 15 min.	Sl. whitened 1 hr.
100 CD 4465				Hard 6 hrs.				
100 Pure Phenolic Resin BR 254								
No. 8								
Same as No. 6 but used latest shipment of 1262	53	G	15	Set 3 hrs. Hard 6 hrs.	Pass 80% Falls 100%	Unaffected	Very sl. whitened. Recovers in 10 min.	Sl. whitened 45 min.
No. 9								
270 Tung Oil	50	H	13	Set 1 hr. Hard 2 hrs.	Pass 120%	Unaffected	Very sl. whitened. Recovers in 10 min.	Sl. whitened 15 min.
30 Linseed Oil								
100 Reduced Phenolic Resin F7								
No. 10								
270 Tung Oil	52.4	C	11	Set 1 hr. Hard 2 hrs.	Pass 150%	Unaffected	Practically unaffected	Unaffected 20 hrs.
30 Linseed Oil								
100 Pure Phenolic Resin BR 254								
No. 11								
200 Poly 01t1 Oil	53	D	14	Set 3 hrs. Hard 16 to 24 hrs.	Falls 80%	Badly whitened. Blistered	Badly whitened. Not recovered in 2 hrs.	Dissolved in 1 min.
100 Rosin								
100 Aroclor 1262								
No. 12								
200 Tung Oil	65.3	C	13	Set 2 hrs. Hard over night	Falls 80%	Badly whitened. Recovers in 1 hr.	Badly whitened. Recovers in 30 min.	Whitened and softened in 1 min.
100 Rosin								
100 Aroclor 1262								
No. 13								
100 Tung Oil	54.7	Under A	17	Set 1 hr. Hard over night	Pass 80%	Badly whitened. Recovers in 30 min.	Sl. whitened. Recovers in 10 min.	-----
100 Poly 01t1 Oil								
100 Phenolic #550								

TABLE I (continued)

VARNISH	NON-VOLATILE	BODY	COLOR	DRYING TIME	KAURI REDUCTION	HOT WATER (1 hr.)	COLD WATER (72 hrs.)	5% NaOH SOLUTION
No. 14	52.4	C	10	Set 1 hr. Hard over night	Pass 12%	Sl. whitened. Recovers in 10 min.	Sl. whitened. Recovers in 10 min.	-----
100 Tung Oil								
100 Poly Oiti Oil								
100 Reduced Phenolic Resin F7								
100 Aroclor 1262								

DSW 550920

STLCOPCB4089337

DISCUSSION OF THE RESULTS SHOWN IN TABLE I:

Aroclor is used in these tests as a replacement for tung oil and it appears to act in that capacity as is shown by the drying times. Take Formula No. 3 as an example. Two hundred tung oil to one hundred of F 7 represents a twenty-five gallon varnish, but with the one hundred of Aroclor 1262 considered as oil, we have approximately a thirty-five gallon varnish. The drying time for this varnish corresponds quite closely to what would be obtained from a thirty-five gallon tung oil varnish with F 7. The Kauri Reduction value is somewhat better than would be expected from a thirty-five gallon tung oil varnish.

Throughout the series the Kauri Reduction values are unusually high. This indicates exceptional extensibility and probably can be translated to mean good durability.

The hot water and cold water tests are fairly good. This was to be expected from the oils and resins used, however. Even where whitening did take place, the recovery was usually within permissible limits.

The alkali resistance tests which were conducted with five per cent caustic soda solutions at room temperature show up very well. The results do not establish, however, that the Aroclor adds materially to the alkali resistance of alkali sensitive resins and oils. Because the Aroclors are not affected by alkalies, we can only be certain that they do not detract in any way from the alkali resistance of the varnish.