

## AROCOR<sup>®</sup> PLASTICIZERS

A series of inert, chemically-resistant, fire-retarding plasticizers compatible with wide variety of resins.

TECHNICAL BULLETIN O/PL-308A

Monsanto

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**A series of inert, chemically-resistant, fire-retarding plasticizers compatible with wide variety of resins.**

TECHNICAL BULLETIN O/PL-306A.

**CAUTION:** see sections entitled Toxicity and Safe Handling, and Environmental Hazards, on page 12.

"Nothing was purchased by Plaintiff from Defendant's store. Plaintiff was merely standing with my sister, SIGNATURE, who was wearing a dress and jewelry of Defendant's store. Defendant refused to give us a satisfactory receipt for a reference upon which information or recommendations, and disclaims all liability for any injury, loss or damage."

Organic Chemicals Division/800 N. Lindbergh Blvd./St. Louis, Missouri 63166

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## Introduction

The unique Aroclor<sup>®</sup> plasticizers are among the most versatile chemically produced materials available. One outstanding characteristic — *inertness* — makes Aroclor useful in many ways for many different applications. The major benefits offered by Aroclor include:

- Chemical Resistance
- Fire Retardance
- Compatibility with most resins
- Nonoxidation
- Adhesivity
- Low Cost

Monsanto's Aroclor plasticizers comprise a series of chlorinated biphenyls and chlorinated polyphenyls. They vary from mobile, oily liquids to white crystals and hard, transparent resins.

Twelve of the Aroclor plasticizers, each of which represents a series, are discussed in this bulletin. An understanding of the system for designation of each Aroclor should prove useful in the evaluation of the property gradations among them. The last two digits indicate the approximate weight percentage of chlorine in the product, and the first two digits indicate the type of material, as follows:

- 12 — chlorinated biphenyls
- 25 — blend of chlorinated biphenyls and chlorinated triphenyls (75:25)
- 44 — blend of chlorinated biphenyls and chlorinated triphenyls (60:40)
- 54 — chlorinated triphenyls

For nearly every Aroclor mentioned, a darker, less-pure grade exists, with about the same physical and chemical characteristics, but lower in price.

## Solubility

The Aroclor liquids and resins are readily soluble in most common organic solvents and drying oils. Although all Aroclor plasticizers are insoluble in water, the hard, crystalline materials are generally less soluble than the liquids and softer resins. Solubilities of some Aroclor plasticizers are shown in Table 1.

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TABLE 1

## SOLUBILITIES OF ARCLOR® PLASTICIZERS IN VARIOUS SOLVENTS

| Solvent                   | Arclor 1247<br>25°C   | Hot                 | Arclor 1248<br>25°C  | Hot | Arclor 1254<br>25°C | Hot                  | Arclor 1266<br>Cold | Hot | Arclor 4465<br>Cold | Hot | Arclor 5450<br>25°C |
|---------------------------|-----------------------|---------------------|----------------------|-----|---------------------|----------------------|---------------------|-----|---------------------|-----|---------------------|
| <b>Acid</b>               |                       |                     |                      |     |                     |                      |                     |     |                     |     |                     |
| Acetic Acid               | S                     | S                   | —                    | —   | S                   | S                    | —                   | —   | SS                  | S   | —                   |
| Oleic Acid                | S                     | S                   | —                    | —   | S                   | S                    | —                   | —   | S                   | VS  | —                   |
| Benzoic Acid              | 10.0 <sup>30°C</sup>  | —                   | 10.0 <sup>32°C</sup> | —   | —                   | —                    | —                   | —   | —                   | —   | —                   |
| <b>Aldehyde</b>           |                       |                     |                      |     |                     |                      |                     |     |                     |     |                     |
| 40% Formaldehyde          | I                     | I                   | I                    | I   | I                   | I                    | I                   | I   | I                   | I   | —                   |
| Formaldehyde              | VS                    | VS                  | VS                   | VS  | VS                  | VS                   | SS                  | SS  | VS                  | VS  | —                   |
| <b>Amine</b>              |                       |                     |                      |     |                     |                      |                     |     |                     |     |                     |
| Aniline                   | S                     | S                   | —                    | —   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Pyridine                  | 137.5 <sup>30°C</sup> | 448 <sup>50°C</sup> | —                    | —   | 114 <sup>31°C</sup> | 425 <sup>100°C</sup> | —                   | —   | VS                  | VS  | —                   |
| <b>Chloro Derivatives</b> |                       |                     |                      |     |                     |                      |                     |     |                     |     |                     |
| Amyl chlorides - mixed    | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Carbon Tetrachloride      | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | 156                 |
| Chloroform                | S                     | S                   | S                    | S   | S                   | S                    | S                   | S   | VS                  | VS  | —                   |
| Dichloroethylene          | —                     | —                   | —                    | —   | —                   | —                    | —                   | —   | VS                  | VS  | —                   |
| Ethyl Chloride            | S                     | S                   | S                    | S   | S                   | S                    | S                   | S   | VS                  | VS  | —                   |
| Mono Chlorobenzene        | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Ortho Dichlorobenzene     | —                     | —                   | —                    | —   | —                   | —                    | —                   | —   | VS                  | VS  | —                   |
| Tetra Chloroethane        | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Trichloroethane           | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Trichloroethylene         | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| <b>Drying Oil</b>         |                       |                     |                      |     |                     |                      |                     |     |                     |     |                     |
| Tung Oil                  | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Linseed Oil               | S                     | S                   | S                    | S   | S                   | S                    | I                   | S   | VS                  | VS  | —                   |
| <b>Ester</b>              |                       |                     |                      |     |                     |                      |                     |     |                     |     |                     |
| Amyl Acetate              | S                     | S                   | S                    | S   | S                   | S                    | S                   | S   | VS                  | VS  | —                   |
| Butyl Acetate             | S                     | S                   | S                    | S   | S                   | S                    | S                   | S   | VS                  | VS  | —                   |
| "Cellasolve" Acetate      | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | VS                  | VS  | —                   |
| Cottonseed Oil            | S                     | S                   | S                    | S   | S                   | S                    | —                   | —   | S                   | VS  | —                   |
| Diethyl Phthalate         | S                     | S                   | S                    | S   | S                   | S                    | S                   | S   | S                   | VS  | —                   |

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|                           |                      |                      |                     |    |                     |                      |    |    |     |    |     |
|---------------------------|----------------------|----------------------|---------------------|----|---------------------|----------------------|----|----|-----|----|-----|
| Diethyl Phthalate         | S                    | S                    | S                   | S  | S                   | S                    | —  | —  | S   | VS | —   |
| Ethyl Acetate             | S                    | S                    | S                   | S  | S                   | S                    | SS | SS | S   | VS | —   |
| Ethyl Lactate             | S                    | S                    | S                   | S  | S                   | S                    | I  | S  | VS  | VS | —   |
| Ethylene Glycol Diacetate | S                    | S                    | S                   | S  | S                   | S                    | —  | —  | VS  | VS | —   |
| Methyl Acetate            | S                    | S                    | S                   | S  | S                   | S                    | SS | SS | S   | S  | —   |
| Tricresyl Phosphate       | S                    | S                    | S                   | S  | S                   | S                    | —  | —  | SS  | S  | —   |
| Ether: Ethyl Ether        | S                    | S                    | S                   | S  | S                   | S                    | S  | S  | S   | —  | —   |
| Ether: Alcohol            |                      |                      |                     |    |                     |                      |    |    |     |    |     |
| Carbitol <sup>®</sup>     | 224 <sup>25°C</sup>  | 307 <sup>30°C</sup>  | VS                  | VS | 173 <sup>25°C</sup> | 259 <sup>32°C</sup>  | I  | S  | SS  | —  | —   |
| Collinsolve               | S                    | S                    | S                   | S  | S                   | S                    | I  | S  | S   | —  | —   |
| Dimethyl Glycol           | —                    | —                    | —                   | —  | —                   | —                    | —  | —  | S   | —  | —   |
| Di-n-Octyl-2-Ethyl Ether  | 16.9 <sup>30°C</sup> | 16 <sup>30°C</sup>   | SS                  | SS | 8 <sup>30°C</sup>   | 10 <sup>30°C</sup>   | —  | —  | SS  | —  | —   |
| Hydrocarbon               |                      |                      |                     |    |                     |                      |    |    |     |    |     |
| Bronzene                  | VS                   | VS                   | VS                  | VS | VS                  | VS                   | S  | S  | VS  | VS | 143 |
| Gasoline                  | VS                   | VS                   | VS                  | VS | VS                  | VS                   | —  | —  | VS  | VS | —   |
| Kerosene                  | VS                   | VS                   | VS                  | VS | VS                  | VS                   | SS | S  | VS  | VS | —   |
| Mineral Spirits           | VS                   | VS                   | VS                  | VS | VS                  | VS                   | S  | S  | VS  | VS | —   |
| Paraffin                  | 2.0 <sup>25°C</sup>  | S                    | 2.0 <sup>25°C</sup> | S  | —                   | S                    | —  | —  | 5.0 | S  | —   |
| Pine Oil                  | S                    | S                    | VS                  | VS | S                   | S                    | S  | S  | S   | S  | —   |
| Toluene                   | VS                   | VS                   | VS                  | VS | VS                  | VS                   | S  | S  | VS  | VS | 142 |
| Turpentine                | VS                   | VS                   | VS                  | VS | VS                  | VS                   | S  | S  | VS  | VS | —   |
| Xylene                    | VS                   | VS                   | VS                  | VS | VS                  | VS                   | S  | S  | VS  | VS | 178 |
| Hydroxy derivatives       |                      |                      |                     |    |                     |                      |    |    |     |    |     |
| Amyl Alcohol              | S                    | S                    | —                   | —  | S                   | S                    | SS | S  | S   | S  | —   |
| n-Butyl Alcohol           | S                    | S                    | —                   | —  | S                   | S                    | I  | SS | SS  | S  | —   |
| Ethyl Alcohol (3-A)       | 23.3 <sup>25°C</sup> | 87.6 <sup>30°C</sup> | —                   | —  | 10 <sup>25°C</sup>  | 28 <sup>25°C</sup>   | I  | I  | SS  | —  | —   |
| Glycerine                 | I                    | I                    | I                   | I  | I                   | I                    | I  | I  | I   | I  | —   |
| Methyl Alcohol            | 42.5 <sup>25°C</sup> | 88.5 <sup>30°C</sup> | —                   | —  | 15 <sup>25°C</sup>  | 22.2 <sup>25°C</sup> | —  | —  | SS  | —  | —   |
| Phenol — 90%              | 194 <sup>30°C</sup>  | S                    | —                   | —  | SS                  | S                    | SS | S  | S   | S  | —   |
| Ketone: Acetone           | S                    | S                    | —                   | —  | S                   | S                    | I  | I  | S   | S  | 260 |
| Miscellaneous             |                      |                      |                     |    |                     |                      |    |    |     |    |     |
| Carbon Disulfide          | S                    | S                    | —                   | —  | S                   | S                    | S  | S  | VS  | VS | —   |
| Nitrobenzene              | S                    | S                    | —                   | —  | S                   | S                    | —  | —  | VS  | —  | —   |
| Water                     | I                    | I                    | I                   | I  | I                   | I                    | I  | I  | I   | I  | —   |

I — Insoluble SS — Slightly Soluble S — Soluble VS — Very Soluble.  
 Figures show grams of Aroclor per 100 milliliters of solvent at 25°C unless otherwise indicated.

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TABLE 2

## CHEMICAL AND PHYSICAL PROPERTIES OF REPRESENTATIVE AROCLOR® PLASTICIZERS AND RESINS

| Property                                                               | Aroclor<br>1221                                    | Aroclor<br>1232              | Aroclor<br>1242              | Aroclor<br>1248              | Aroclor<br>1254                |
|------------------------------------------------------------------------|----------------------------------------------------|------------------------------|------------------------------|------------------------------|--------------------------------|
| Appearance                                                             | Clear,<br>mobile oil                               | Clear,<br>mobile oil         | Clear,<br>mobile oil         | Clear,<br>mobile oil         | Light-yellow<br>viscous liquid |
| Color, maximum                                                         | *100 APHA                                          | *100 APHA                    | *100 APHA                    | *100 APHA                    | *100 APHA                      |
| Chlorine, percent                                                      | 20.5-21.5                                          | 31.5-32.5                    | 42                           | 48                           | 54                             |
| Acidity, mg KOH/g, maximum                                             | *0.014                                             | *0.014                       | *0.015                       | *0.010                       | *0.010                         |
| Moisture, ppm, maximum                                                 | —                                                  | —                            | *50                          | *50                          | *50                            |
| Ave. Coefficient of Expansion, cc/cc/°C                                | 0.00071<br>(15°-40°C)                              | 0.00073<br>(25°-100°C)       | 0.00068<br>(25°-65°C)        | 0.00070<br>(25°-65°C)        | 0.00066<br>(25°-65°C)          |
| Specific Gravity                                                       | *1.182-1.192<br>(25°/15.5°C)                       | *1.270-1.280<br>(25°/15.5°C) | *1.381-1.392<br>(25°/15.5°C) | *1.405-1.415<br>(65°/15.5°C) | *1.495-1.505<br>(65°/15.5°C)   |
| Density, pounds per gallon, 25°C                                       | 9.85                                               | 10.55                        | 11.50                        | 12.04                        | 12.82                          |
| Distillation Range, °C, corrected<br>(ASTM D-20, modified)             | 275-320                                            | 290-325                      | 325-366                      | 340-375                      | 365-390                        |
| Evaporation Loss, %, 160°C, 8 hours<br>(ASTM D-6, mod.) 163°C, 5 hours | 1.0-1.5                                            | 1.0-1.5                      | 0-0.4<br>3.0-3.6             | 0-0.3<br>3.0-4.0             | 0-0.2<br>1.1-1.3               |
| Flash Point (Cleveland Open Cup), °C<br>°F                             | 141-150<br>286-302                                 | 152-154<br>305-310           | 176-180<br>348-356           | 193-196<br>379-384           | None to<br>boiling point       |
| Fire Point (Cleveland Open Cup), °C<br>°F                              | 176<br>343                                         | 238<br>460                   | None to<br>boiling point     | None to<br>boiling point     | None to<br>boiling point       |
| Pour Point (ASTM E-97), °C<br>°F                                       | 1 (crystals)<br>34 (crystals)                      | -35.6<br>-32                 | -19<br>2                     | -7<br>19.4                   | 10<br>50                       |
| Softening Point (ASTM E-28), °C<br>°F                                  | —                                                  | —                            | —                            | —                            | —                              |
| Refractive Index, n D-20                                               | 20°C<br>1.617-1.618                                | 1.620-1.622                  | 1.627-1.629                  | 1.630-1.631                  | 1.639-1.641                    |
| Viscosity, Seconds Saybolt Universal<br>(ASTM D-88)                    | 100°F (37.8°C)<br>130°F (54.4°C)<br>210°F (98.9°C) | *38-41<br>35-37<br>30-31     | *44-51<br>35-41<br>31-32     | *52-92<br>45-66<br>34-35     | 165-240<br>73-80<br>36-37      |
|                                                                        |                                                    |                              |                              | 165-240<br>73-80<br>36-37    | 1600-2500<br>260-340<br>*44-48 |

\*Minimum Specifications.

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| Aroclor<br>1260                        | Aroclor<br>1272                          | Aroclor<br>R442              | Aroclor<br>4468                  | Aroclor<br>2565                 | Aroclor<br>8460                                           | Aroclor<br>1268                  |
|----------------------------------------|------------------------------------------|------------------------------|----------------------------------|---------------------------------|-----------------------------------------------------------|----------------------------------|
| Light-yellow,<br>soft,<br>sticky resin | Light-yellow<br>sticky, viscous<br>resin | Clear yellow<br>sticky resin | Clear,<br>light-yellow,<br>resin | Black, opaque,<br>brittle resin | Clear, yellow-<br>to-amber,<br>brittle resin<br>or flakes | White to<br>off-white<br>powder  |
| *150 APHA                              | *150 APHA                                | *2 NPA<br>(molten)           | *2 NPA<br>(molten)               | —                               | *2 NPA<br>(molten)                                        | *1.5 NPA<br>(molten)             |
| 60                                     | 61.5-62.5                                | 42                           | 85                               | 85                              | 58.5-60.8                                                 | 68                               |
| *0.614                                 | *0.014                                   | 0.05                         | 0.05                             | 1.4                             | 0.05                                                      | 0.05                             |
| *50                                    | —                                        | —                            | —                                | —                               | —                                                         | —                                |
| 0.00067<br>(20°-100°C)                 | 0.00054<br>(25°-65°C)                    | 0.00123<br>(25°-99°C)        | 0.00061<br>(25°-65°C)            | 0.00065<br>(25°-65°C)           | 0.00179<br>(25°-124°C)                                    | 0.00067<br>(20°-100°C)           |
| *1.555-1.598<br>(30°/15.5°C)           | *1.572-1.583<br>(30°/15.5°C)             | 1.470<br>(25°/25°C)          | 1.670<br>(25°/25°C)              | 1.734<br>(25°/25°C)             | 1.670<br>(25°/25°C)                                       | 1.804-1.811<br>(25°/25°C)        |
| 13.50                                  | 13.72                                    | 12.24                        | 13.91                            | 14.44                           | 13.91                                                     | 15.09                            |
| 385-420                                | 390-425                                  | 215-300<br>(4 mm. Hg)        | 230-320<br>(4 mm. Hg)            | —                               | 260-335<br>(5 mm. Hg)                                     | 435-450                          |
| 0-0.1<br>0.5-0.8                       | 0-0.1<br>0.5-0.6                         | 0.01<br>0.2                  | 0-0.02<br>0.2-0.3                | 0.2-0.3                         | 0.03                                                      | 0-0.06<br>0.1-0.2                |
| None to<br>boiling point               | None to<br>boiling point                 | 247<br>477                   | None to<br>boiling point         | —                               | None to<br>boiling point                                  | None to<br>boiling point         |
| None to<br>boiling point               | None to<br>boiling point                 | > 350<br>> 662               | None to<br>boiling point         | —                               | None to<br>boiling point                                  | None to<br>boiling point         |
| 31<br>88                               | 38-33<br>69                              | 48<br>116                    | —                                | —                               | —                                                         | —                                |
| —                                      | —                                        | *48-52<br>115-128            | *60-68<br>140-151                | *68-72<br>149-162               | *98-105<br>208-222                                        | *150-170 (hold<br>302-333 point) |
| 1.647-1.649                            | 1.6501-1.6517                            | —                            | 1.664-1.667                      | —                               | 1.660-1.635                                               | —                                |
| 3200-4500<br>*72-78                    | 609-850<br>(150°F; 71°C)<br>*86-100      | 350-400                      | 50-150<br>(260°F; 130°C)         | —                               | —                                                         | —                                |

\*Manufacturer Specifications.

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## Density

All the Aroclor plasticizers are heavier than water, a valuable property for many applications. Densities are shown in Figure 1.

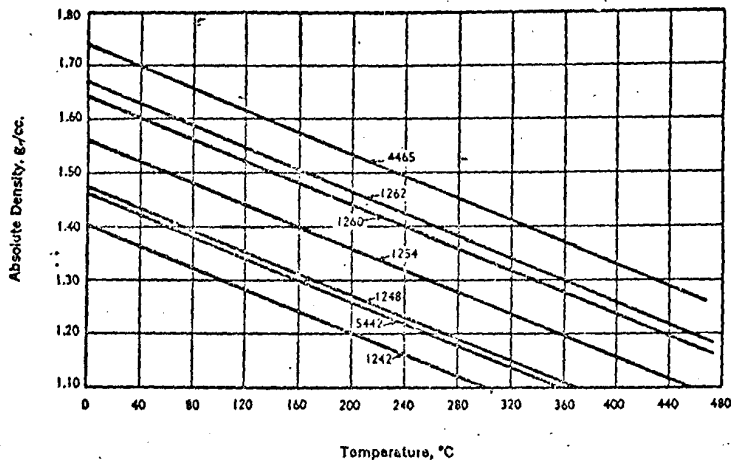


Fig. 1 — Densities of Aroclor® Plasticizers at Various Temperatures

## Specific Volume

The specific volume of Aroclor 1248 at different temperatures is as follows:

| Temperature<br>(°F) | Aroclor® 1248<br>Specific Volume (ml/g) |
|---------------------|-----------------------------------------|
| 0                   | 0.674                                   |
| 100                 | 0.699                                   |
| 200                 | 0.726                                   |
| 300                 | 0.755                                   |
| 400                 | 0.790                                   |
| 500                 | 0.828                                   |
| 600                 | 0.870                                   |

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The low vaporization loss of Aroclor plasticizers is indicated in Table 3.

TABLE 3

| VAPORIZATION RATES OF AROCLOR® PLASTICIZERS          |                         |                                        |                                                  |
|------------------------------------------------------|-------------------------|----------------------------------------|--------------------------------------------------|
| <i>Plasticizer<br/>(Surface area: 12.28 sq. cm.)</i> | <i>Wt. Loss<br/>(g)</i> | <i>Exposure<br/>at 100°C<br/>(hr.)</i> | <i>Vaporization<br/>Rate<br/>(g/sq. cm./hr.)</i> |
| Aroclor 1221                                         | 0.5125                  | 24                                     | 0.00174                                          |
| Aroclor 1232                                         | 0.2572                  | 24                                     | 0.000874                                         |
| Aroclor 1242                                         | 0.0995                  | 24                                     | 0.000338                                         |
| Aroclor 1248                                         | 0.0448                  | 24                                     | 0.000152                                         |
| Clorofin®-42-S                                       | 0.0745                  | 48                                     | 0.000128                                         |
| Diocetyl phthalate                                   | 0.0686                  | 48                                     | 0.000117                                         |
| Dutrex® 25                                           | 0.0256                  | 24                                     | 0.000087                                         |
| Aroclor 1254                                         | 0.0156                  | 24                                     | 0.000053                                         |
| Shell Dutrex 20                                      | 0.0047                  | 24                                     | 0.000016                                         |
| Aroclor 1262                                         | 0.0039                  | 24                                     | 0.000013                                         |
| Aroclor 1260                                         | 0.0026                  | 24                                     | 0.000009                                         |
| Aroclor 4465                                         | 0.0064                  | 72                                     | 0.000007                                         |
| Aroclor 5442                                         | 0.0039                  | 72                                     | 0.000004                                         |
| Aroclor 5460                                         | 0.0032                  | 72                                     | 0.000004                                         |
| Tricresyl phosphate                                  | 0.0016                  | 24                                     | 0.000003                                         |

It is concluded that the vaporization rates of Aroclor plasticizers — especially the most widely used 1254 and 1260 — compare most favorably with the similar constants of other plasticizers selected specifically for these tests because of their low vaporization rates.

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# Vapor Pressure

The vapor pressures of several Aroclor plasticizers are indicated in Figure 2 over the temperature range 150° to 300°C.

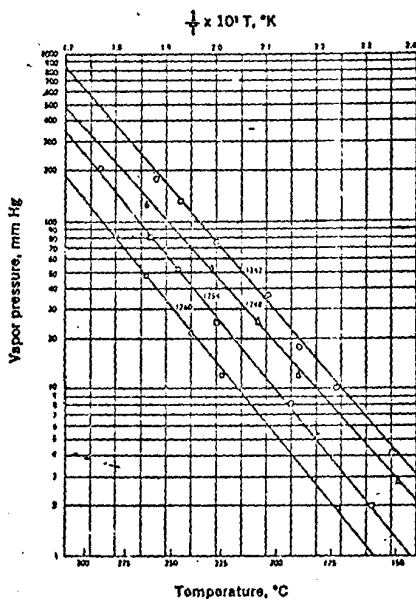


Fig. 2 — Vapor Pressures of Aroclor® Plasticizers

The estimated vapor pressures of several Aroclor plasticizers at 100°F shown in the following table were determined by extrapolation from the values shown in Figure 2.

Approximate Vapor Pressure of Aroclor® Plasticizers  
Estimated 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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The viscosities of the Aroclor plasticizers vary according to whether the base material is a biphenyl or a polyphenyl and on the degree of chlorination. In general the low-chlorinated biphenyls have the lowest viscosities (Figure 3).

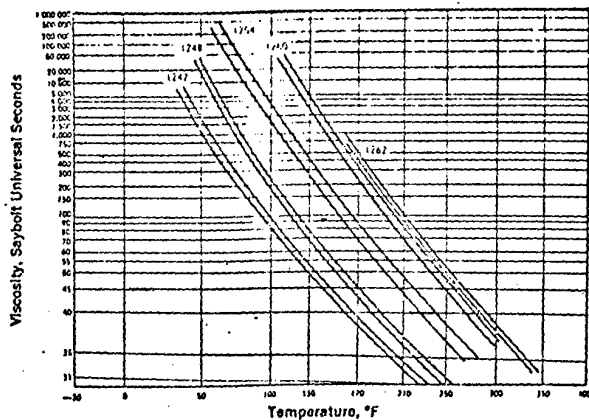


Fig. 3 — Viscosity Ranges of Some Aroclor® Plasticizers

***Inhalation***

At ordinary temperatures the Aroclor chlorinated polyphenyls have not presented industrial toxicological problems. The hazard of potential toxic exposure varies with their volatility: the lower-chlorinated, more-volatile ones present more of a potential problem from the standpoint of both inhalation and skin contact. When Aroclor plasticizers are 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.

Vapor of the liquid Aroclor plasticizers at room temperature should not be breathed in a confined space, and no vapor of any Aroclor evolved at elevated temperatures should be allowed to be dispersed into the general workroom.

Inhalation tests on animals indicate that the maximum safe concentration of vapor is in the range of from 0.5 to 1.0 milligram of the lower-chlorinated Aroclor plasticizers per cubic meter of air. The threshold limit values (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.

***Skin Contact***

Schwartz patch tests on 200 volunteers showed that Aroclor 1254 was neither a primary skin irritant or a sensitizer.

Prolonged or repeated skin contact with the Aroclor plasticizers must be avoided by the use of gloves and protective garments, because of the possible occurrence of a condition called chloracne. Although reports of this condition caused by Aroclor are rare, it can be produced by excessive skin contact. 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 plasticizer 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.

#### *Environmental Hazards*

Aroclor 1232, Aroclor 1242, Aroclor 1248, Aroclor 1254, Aroclor 1260, Aroclor 1262, Aroclor 1268, Aroclor 4465, and Montar 1 all contain polychlorinated biphenyls (PCB) of various types and in varying amounts. PCB residues in small amounts have been found in the environment and some studies have indicated that they may be harmful to certain forms of animal life. Extreme care should therefore be taken by all users of PCB-containing products to prevent any entry into the environment through spills, leakage, use, disposal, vaporization or otherwise. Further, the products in which PCB materials are used, or which are formulated using PCB materials as a component, should be given careful study to eliminate the possibility that PCB might reach the environment as a result of use in a given application.

Some specific applications where the use of PCB should definitely be avoided are in paints and sealants for swimming pools, paints and waterproofing agents in silos and other buildings where food products for humans or animals are stored, and as a component of any container or wrapping used in the packaging of food products.

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## Shipping

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### *Freight Classification*

Aroclor 1221, 1232, 1242,  
1248, 1254, 1260, 1262

Synthetic Resin, Liquid, NOIBN

### *Rail Classification*

Aroclor 1268, 4465,  
5442, 5460

Synthetic Resin, Other Than  
Liquid, NOIBN

### *Truck Classification*

Aroclor 1268  
Aroclor 4465, 5442, 5460

Synthetic Resin, Powder, NOI  
Synthetic Resin, Lumps or  
Solid Mass, NOI

### *Shipping Regulations*

None

### *Standard Containers*

Aroclor 1221  
Aroclor 1232  
Aroclor 1242, 1248, 1254,  
1260, 1262  
Aroclor 1268  
Aroclor 4465  
Aroclor 5442  
Aroclor 5460 (flaked)

Tank car, 520-lb. steel drum,  
50-lb. can  
Tank car, 550-lb. steel drum,  
50-lb. can  
Tank car, 600-lb. steel drum,  
50-lb. can  
200-lb. fiber drum, 25-lb. fiber  
drum  
500-lb. steel drum, 50-lb. can  
450-lb. steel drum, 50-lb. can  
50-lb. bag

# DISTRICT SALES OFFICES ALL DIVISIONS

## AKRON, OHIO 44313

260 Springside Drive  
Montrose Development Park  
Tel. (716) 666-4111

## ATLANTA, GEORGIA 30326

Lenox Towers East  
3400 Peachtree Rd. N. E. - Suite 1711  
Tel. (404) 577-2260

## BOSTON, MASSACHUSETTS 02149

Everett Station  
Tel. (617) 387-5010

## CHICAGO, ILLINOIS

3158 Des Plaines Ave.  
Des Plaines, Illinois 60018  
Tel. (312) 296-6688

## CINCINNATI, OHIO 45206

1501 Madison Road  
Tel. (513) 751-6707

## DETROIT, MICHIGAN

600 Northland Towers West  
Southfield, Mich. 48075  
Tel. (313) 357-0910

## HONOLULU, HAWAII 96812

205 Pacific International Bldg.  
677 Ala Moana Blvd., P. O. Box 3824  
Tel. (808) 531-2744

## HOUSTON, TEXAS 77027

1301 Post Oak Tower  
6051 Westheimer Road  
Tel. (713) 621-9550

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6670 E. Flotilla St.  
Tel. (213) 723-2492

## NEW YORK, NEW YORK 10017

277 Park Avenue  
Tel. (212) 922-4111

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600 N. Lindbergh Blvd.  
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Tel. (408) 243-0414

## SEATTLE, WASHINGTON 98121

2112 Third Avenue  
Tel. (206) 622-4203

## WILMINGTON, DELAWARE 19803

2005 Concord Pike, Fairfax  
Tel. (302) 658-6531

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DECATUR, ILLINOIS 62523  
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363 South Main Street  
Tel. (217) 423-6031

DES MOINES, IOWA 50310  
312 Merle Ray Tower  
Tel. (515) 276-8503

FREMONT, NEBRASKA 68025  
150 South Main Street  
Tel. (402) 727-1230

INDIANAPOLIS, INDIANA 46206  
Suite 215, 4002 Meadows Drive Building  
Tel. (317) 547-9148

KANSAS CITY, MISSOURI 64133  
701 Blue Ridge Tower  
4240 Blue Ridge Boulevard  
Tel. (816) 363-8060

LULING, LOUISIANA 70070  
P. O. Box 174  
Tel. (504) 784-6283

MAHATTO, MINNESOTA 56001  
111 Madison East  
Tel. (657) 387-3408

MEMPHIS, TENNESSEE 38104  
303 Union Plaza Building  
1836 Union Avenue  
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MUSCATINE, IOWA 52761  
P. O. Box 473  
Tel. (319) 263-1331

### Hydrocarbons & Polymers Division

NEW ENGLAND AREA  
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Indian Orchard, Mass. 01051  
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### Lion Oil

EL DORADO, ARKANSAS 71730  
Lion Oil Building  
Tel. (501) 853-3111

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P. O. Box 10537, Westland Station  
Tel. (601) 352-3648

N. LITTLE ROCK, ARKANSAS 72119  
410 W. 5th Street, P. O. Box 5821  
Tel. (501) 376-2437

MEMPHIS, TENNESSEE 38113  
1023 Riverside Drive, P. O. Box 13248  
Tel. (901) 948-4451

### Plastic Products & Resins Division

EUGENE, OREGON 97402  
855 Seneca Road  
Tel. (503) 342-7201

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P. O. Box 2130  
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### Textiles Division

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