Monsanto

ORGANIC CHEMICALS

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August 6, 1970

MCS 1016

Since environmental probes for PCB's reflect the presence of the more highly chlorinated biphenyl compounds, Monsanto prepared an experimental amount of Aroclor 1242 from which a significant portion of the more highly chlorinated compounds have been removed.

This experimental material is called MCS 1016. The amount you requested for your capacitor studies is enroute to your attention, delivered at no charge.

Attached is our comprehensive analysis, indicating the properties typical for MCS 1016. The enclosed list of Aroclor 1242 properties is for your convenience in comparing these two materials.

The comparison reflects what one would expect after removing a significant amount of the more highly chlorinated biphenyl compounds from Aroclor 1242.

The excellent resistivity and power factor values given for MCS 1016 do not reflect a decimal point in the wrong place. However, it is not to be misconstrued that the electrical values of MCS 1016 are intrinsically superior to those obtainable with Aroclor 1242. Both materials attain these excellent electrical values when highly refined by adsorbents.

DSW 338224

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The electrical values given for MCS 1016 are not based on a sample from the storage tank. Instead, they are based on individual analysis of about ten samples removed from the drums in which the material was packaged. To account for the good results, we wish to indicate that handling, sampling, and analytical work on this experimental material was supervised by Dr. Ralph Nunch in our Research Laboratories. He employed his recently-developed procedure which encompasses special care required for the proper analysis of the power factor and resistivity of highly refined Aroclor.

In light of this careful handling and testing at our end, and the wide simultaneous distribution of this material to the capacitor makers, we have good opportunity for a "round-robin" test of power factor and resistivity. We will appreciate it if you will sample your shipment promptly and give us your readings of power factor and resistivity.

In any event, the prime purpose of sending the MCS 1016 is to give you an opportunity to run capacitor life tests. Looking ahead, it appears likely that we will need to convert to the MCS 1016 type material as a step in the direction of helping on the PCB pollution problem.

Thank you for your assistance.

Very truly yours,

Paul G. Benignus
Market Manager
Dielectric Fluids

PGB:PH

Attach.

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CAPACITOR DIELECTRIC MCS 1016

(Similar to Aroclor 1242, except that some of the more highly chlorinated biphenyls have been removed)

PROPERTY	TYPICAL
Appearance	Clear, colorless liquid
Color, APHA	10
Acidity (ASTM D974, D664)	0.001 mg KOH/g
Water (ASTM D1533-60)	40 ppm
Inorganic Chlorides (ASTM D1821)	0.02 ppm
Specific Gravity 25/15.5°C (ASTM D1810)	1.364
Viscosity 37.8°C (ASTM D88-56)	73.8 SUS
Refractive Index 26°C (ASTM D1807)	1.6219
Dielectric strength (ASTM D877)	44KV
Pour Point, °C (ASTM D97-57)	-20°C
Hydrolyzable Chlorine Compounds, (ASTM D1820-65)	0.07 ppm
Hydrolyzable Chlorine Compounds, by Refluxing (ASTM D2441-65T)	0.17 ppm
Thermal Stability (ASTM D1936-64)	0.09 ppm
Distillation Range (ASTM D20-56)	10% - 327°C 90% - 342°C
Resistivity, 100°C 500 volts DC at 0.1 inch gap (ASTM D1169)	400,000 X 10^9 ohm-cm. min.
Dielectric Constant (ASTM D924-49) 100 C; 60 Hz	4.88
Power Factor (ASTM D924-49) 100 C; 60 Hz	0.1%
Flash Point, Clev. open cup (ASTM D92-57)	350 to 365°F

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AROCLOR 1242 (Trichlorobiphenyl)

Specification Properties - September 27, 1962

PROPERTY	TYPICAL
Visc. at 37.8°C. (ASTM D88-56)	82 - 92 seconds Saybolt Universal
Specific Gravity at 25/15.5°C. (ASTM D1810)	1.381 - 1.392
Color, APHA	50 max.
Condition	Clear
Acidity, mg. KOH/g. (ASTM D974, D664)	0.01 max.
Pour Point, °C. (ASTM D97-57)	-14 or lower
Inorganic Chlorides (ASTM D1821)	0.05 ppm. max.
Refractive Index at 25°C. (ASTM D1807)	1.6240 - 1.6260
Distillation Range (ASTM D20-56) °C. corrected for stem and barometric pressure	10% 325 min. 90% 360 max.
Water content (ASTM D1533-60)	35 ppm. max
Resistivity, 100°C. 500 volts DC at 0.1 inch gap. (ASTM D1169)	500 X 10^9 ohm-cm. min.
Dielectric constant, 100°C. at 1,000 cycles (ASTM D924-49)	4.7 to 4.9
Flash Point, Cleve. open cup (ASTM D92-57)*	170° to 200°C.
Fire Point*	None to boiling point
Sulfates (ASTM D117-31)*	None
Fixed Chlorine Content (Carius)*	43 ± 0.5%
Specific Heat at 25°C.*	0.29
Evaporation at 100°C. for 6 hrs.*	0.4% max.
Dielectric strength (ASTM D877-49) at 25°C. KV min.*	35
Hydrolyzable Chlorine Compounds, (ASTM D1820-61) ppm. chlorides, max.	0.5
Thermal Stability (ASTM D1936) ppm. chlorides, max.	0.4
Coefficient of Thermal Expansion* (ASTM D1903)	0.00068 cc./cc./°C.

*Not determined unless by special request.

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