INSTRUCTIONS FOR

CLOR-N-OIL®500

PCB Screening Kit

A PCB screening test for transformer oil.

EACH KIT CONTAINS:

1. Tube #1 - A plastic test tube with a black dispensing cap containing a gray ampule (top) and a blue-dot ampule (bottom).
2. Tube #2 - A red-capped plastic test tube containing 7 ml of buffer solution, a red-dot ampule (bottom) and a colored ampule (top).
3. A plastic pipette.
4. A glass ampule contained in a cardboard sleeve and plastic tube designated as "Disposal Ampule".

READ CAUTION AND INFORMATION SECTIONS ON BACK BEFORE PERFORMING TEST. WEAR RUBBER GLOVES AND SAFETY GLASSES.

DIRECTIONS

1. SET-UP Remove contents from box. Check contents to ensure that all items are present and intact. Place the two plastic tubes into the holder at the front of the box.

2. SAMPLE PREPARATION Unscrew the black dispensing cap from Tube #1. Using the plastic pipette, transfer exactly 5 ml (up to the line) of transformer oil to be tested into the tube. Replace the black dispensing cap securely.

3. REACTION Break the bottom (colorless, blue-dot) ampule in the tube by compressing the sides of the tube. Mix thoroughly by shaking the tube vigorously for about 10 seconds. Break the top (gray) ampule in the tube and shake thoroughly for about 10 seconds. (Make sure that the colorless ampule is broken first, the gray one second. Allow the reaction to proceed for an additional 50 seconds (total of one minute), while shaking intermittently several times.

4. EXTRACTION Remove the caps from both tubes and pour the clear buffer solution from Tube #2 (red cap) into Tube #1. Replace the black cap tightly on Tube #1 and shake vigorously for about 10 seconds. Vent the tube carefully by partially unscrewing the dispensing cap. Close securely and shake well for an additional 10 seconds. Vent again, tighten cap and stand tube upside down on its cap. The oil mixture should no longer appear gray. Allow the phases to separate for a full two minutes. If the oil layer is below the buffer layer, discontinue the test at this point as the oil is primarily pure PCB (Askarel). See photograph on the back of this sheet. If the oil layer is above the water layer, continue the test.

5. ANALYSIS Position Tube #1 over the top of Tube#2 and open nozzle on the black dispensing cap. Be sure to point the nozzle away from the operator while opening it, and check that the nozzle is open completely before dispersing the clear solution. Dispense 5 ml of the clear solution into Tube #2 (up to the 5 ml line) by squeezing the sides of Tube #1. Close the nozzle on the dispensing cap on Tube #1. Replace the cap on Tube #2. Break the bottom (colorless, red-dot) ampule and shake for 10 seconds. Break the top (colored) ampule and shake for 10 seconds.

6. RESULTS Observe the resultant color immediately and compare to the color chart below for chlorine determination. If the solution appears purple, the oil sample contains less 500 ppm PCB. If it solution appears yellow or colorless, it MAY contain more than 500 ppm PCB and should be tested further by a PCB specific method. Disregard any color that may develop in a thin layer of oil that might form on top of the solution.

7. DISPOSAL Open the “Disposal Ampule” container and drop the ampule into Tube #2. Replace the cap on the test tube. Crush the ampule by squeezing the sides of the tube. Shake for 5 seconds. This reagent immobilizes the mercury so that the kit passes the EPA’s TCLP test. See caution section below for additional information on disposal.

SUGGESTIONS FOR USING
THE CLOR-N-OIL® PCB TEST KIT

- The Clor-N-Oil Test Kit works on the principle of chlorine determination. Since PCBs are chlorine-based materials, the test kit is able to detect them. However, the test cannot distinguish between any other chlorine-containing such as trichlorobenzene which may also be found in transformer oil. These compounds may cause a result known as a "false positive", i.e., the oil will indicate the presence of over 500 ppm PCBs, but when analyzed by gas chromatography will show a value less than 500 ppm.

- The test works on the principle of chloride detection. Therefore, contamination by salt (sodium chloride), sea water, perspiration, etc., will give a false positive result and further testing in a laboratory will be necessary.

- Never touch the ampules, the holder inside the tube, or the pipette tip, as it may contaminate the test.

- The kit should be examined upon opening to see that all of the components are present and that all the ampules (5) are in place and not leaking. The liquid in Tube #2 (red cap) should be approximately ½ inch above the 5 ml line and the tube should not be leaking. The ampules are not intended to be completely full.

- The Clor-N-Oil test is not intended for samples that contain water. If Tube #1 feels noticeably warm, builds up pressure, or loses its gray color in Step 3, the sample probably contains water and the test should not be continued. Another test may be attempted if the oil sample is dried first.

- Perform the test in a warm, dry area with adequate light. In cold weather, a truck cab is sufficient. If a warm area is not available, Step 3 should be performed while warming Tube #1 in palm of hand.

- When drawing the oil sample into the pipette, do not submerge the pipette tip too deeply as it will cause the pipette to drip.

- When inserting the pipette into the plastic test tube, insert it all the way to the 5 ml line. This prevents oil from getting on the tube walls and ampule holder, resulting in too much oil in the tube.

- Always crush the colorless ampule in each tube first. If this sequence has not been followed, stop the test immediately and start over using another complete

kit. When an incorrect testing sequence is followed, a false negative may result which may allow a contaminated sample to pass without detection.

- In Step 4, tip Tube #2 to an angle of only 45^{o} to prevent the ampule holder from sliding out.
- This test is intended for use only with transformer oil of petroleum origin, and is not intended for testing other types of fluids.

SPECIAL INSTRUCTIONS FOR ASKAREL-FILLED TRANSFORMERS

- In Step 4, **if the oil layer goes to the bottom (shown in the photograph above), discontinue test at this point as the oil is primarily pure PCB (Askarel).** Continuing the test further will transfer the oil into Tube #2 and leave the water layer behind, which will cause false results.

CAUTION

- When crushing the glass ampules, press firmly in the center of the glass ampule **ONCE**. Never attempt to re-crush broken glass as it may come through the plastic and cut fingers.

- In case of accidental breakage or spillage onto skin or clothing, wash immediately with large amounts of water. All the ampules are poisonous and should not be taken internally.

- Do not carry kits on passenger aircraft.

- Dispose of used kits properly. Tube #1 and #2 may contain residual PCB's and should be treated as PCB waste if the test results is positive. The mercury in Tube #2 is made insoluble by the disposal ampule and used kits will pass the USEPA TCLP test for land disposal. More stringent state and local regulations may apply. Contact Dexsil if you have any specific questions concerning disposal procedure.

- The gray ampule in the black-capped test tube contains metallic sodium. Metallic sodium is a flammable solid and is water reactive.

- Wear rubber gloves and safety glasses while performing test.

- Read the Material Safety Data Sheet before performing the test.

- Keep Out of Reach of Children.

The development work for this kit was sponsored by Electric Power Research Institute, Palo Alto, California and carried out by General Electric Company, Pittsfield, Massachusetts and Dexsil Corporation, Hamden, Connecticut.

MANUFACTURER'S WARRANTY

This kit is warranted to be free of defects in material and workmanship until the expiration date stamped on the box. Manufacturer's sole and exclusive liability under this warranty shall be limited to replacement of any kit that is proven to be defective. Manufacturer shall not be liable for any incidental or consequential damages.

Reliable test results are highly dependent upon the care with which the directions are followed and, consequentially, cannot be guaranteed.

This kit is manufactured by DEXSIL® Corporation
One Hamden Park Drive, Hamden, Connecticut 06517
(203) 288-3509 FAX: (203) 248-6523
http:((www.dexsil.com

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